### BS<sub>C</sub>

### Syllabuses and Regulations (4-year curriculum)

2014-15

**Faculty of Science**The University of Hong Kong

### **General Information**

This booklet includes information on:

#### BSc Degree curriculum and graduation requirements

#### > List of courses and descriptions

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

#### Majors & Minors

Details of the Science Majors and Minors available for students.

#### > Degree regulations

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

#### > Teaching weeks

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

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

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

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BSc Degree Curriculum and

**Graduation Requirements** 

#### SECTION I BSc Degree Curriculum and Graduation Requirements

#### 1. A BSc Degree Curriculum

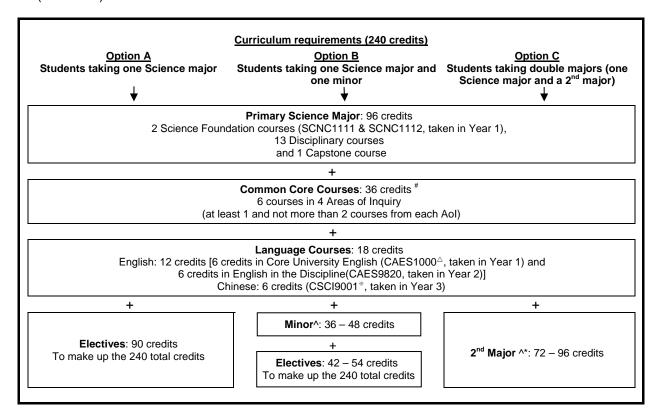
The Faculty of Science offers a number of Science majors leading to the award of a BSc degree.

All students admitted to the 6901 BSc programme under the 4-year curriculum are required to complete at least one Science major out of the 15 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 2014-15 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

graduated with an undergraduate 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 a 27 on the writing and speaking sections and no less than a 24 on the listening and reading sections

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

achieved an 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\* on the GCE English A level examination

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

- <sup>‡</sup> 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<sup>1</sup> (i.e. CAES1000) and 6 credits in an English in the Discipline course<sup>2</sup> (i.e. CAES9820 Academic English for Science Students);
  - (b) 6 credits in Chinese language enhancement<sup>3</sup> (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.

Students with 5\*\* on the English examination for the HKDSE

Students whose first language is English

Students who have completed the International Baccalaureate in English

Students with an IELTS score of no less than a 7 on all of the four tests (The IELTS Reading, Writing, Listening and Speaking Tests)

Students with a TOEFL IBT score of 95 or above

Students with a degree already awarded from an English Medium University

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

<sup>2 (</sup>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.

<sup>(</sup>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.

<sup>(</sup>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.

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** 

#### 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	Recog	gnized Cap	stone Courses
1.	Biochemistry	2. BIG	OC4966	Directed studies in biochemistry (6) Biochemistry internship (6) Biochemistry project (12)
2. 3. 4.	Biological Sciences Food & Nutritional Science Molecular Biology & Biotechnology	2. BIO 3. BIO	OL3999 OL4966	Biological sciences field course (6) Directed studies in biological sciences (6) Biological sciences internship (6) Biological sciences project (12)
5.	Chemistry	<ol> <li>CH</li> <li>CH</li> <li>CH</li> </ol>	HEM4910 HEM4911 HEM4966	Directed studies in chemistry (6) Chemistry literacy and research (6) Capstone experience for chemistry undergraduates: HKUtopia (6) Chemistry internship (6) Chemistry project (12)
6.	Earth System Science			Earth system: contemporary issues (6)
7.	Ecology & Biodiversity	2. BIO 3. BIO 4. BIO	OL3999 OL4911 OL4966	Biological sciences field course (6) Directed studies in biological sciences (6) Conservation science in practice (6) Biological sciences internship (6) Biological sciences project (12)
8.	Environmental Science	<ol> <li>EN</li> <li>EN</li> <li>EN</li> </ol>	IVS4955 IVS4966 IVS4999	Directed studies in environmental science (6) Environmental science in practice (6) Environmental science internship (6) Environmental science project (12)
9.	Geology	1. EA	SC4955	Integrated field studies (6)
10.	Mathematics	2. MA 3. MA 4. MA	ATH4910 ATH4911 ATH4966	Directed studies in mathematics (6) Senior mathematics seminar (6) Mathematics capstone project (6) Mathematics internship (6) Mathematics project (12)
11.	Mathematics / Physics	2. MA 3. MA 4. MA 5. MA 6. PH 7. PH 8. PH	ATH4910 ATH4911 ATH4966 ATH4999 IYS3999 IYS4966 IYS4999	Directed studies in mathematics (6) Senior mathematics seminar (6) Mathematics capstone project (6) Mathematics internship (6) Mathematics project (12) Directed studies in physics (6) Physics internship (6) Physics project (12)
	Astronomy Physics	2. PH 3. PH	IYS4966 IYS4999	Directed studies in physics (6) Physics internship (6) Physics project (12)
	Risk Management Statistics	<ol> <li>ST.</li> <li>ST.</li> </ol>	AT4710	Directed studies in statistics (6) Capstone experience for statistics/risk management undergraduates (6) Statistics internship (6) Statistics project (12)

**Credit Unit Statement of** 

**BSc Degree Curriculum** 

SECTION III Credit Unit Statement of the BSc Degree Curriculum (4-year)

#### 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 15 Science Majors and 16 Science Minors are as follows:

			Type of Cour	ses		
Majors/Minors	Lecture- based	Lecture with laboratory component	Laboratory & Workshop	Project- based	Field camps	Internship
Actuarial Studies (Minor)	✓	✓	✓	✓		✓
Astronomy (Major & Minor)	✓	✓	✓	✓		✓
Biochemistry (Major & Minor)	✓	✓	✓	✓		✓
Biological Sciences (Major)	✓	✓	✓	✓		✓
Chemistry (Major & Minor)	✓	✓	✓	✓		✓
Computational & Financial Mathematics (Minor)	<b>✓</b>	✓	✓	<b>✓</b>		<b>✓</b>
Earth Sciences (Minor)	✓	✓	✓	✓	✓	~
Earth System Science (Major)	✓	✓	✓	✓	✓	✓
Ecology & Biodiversity (Major & Minor)	✓	✓	✓	<b>✓</b>	✓	✓
Environmental Science (Major & Minor)	✓	✓	<b>✓</b>	<b>✓</b>	<b>√</b>	<b>✓</b>
Food & Nutritional Science (Major & Minor)	✓	✓	<b>✓</b>	✓		✓
Geology (Major)	✓	✓	✓	✓	✓	~
Marine Biology (Minor)	✓	✓	✓	✓	✓	✓
Mathematics (Major & Minor)	✓	✓	✓	✓		✓
Mathematics / Physics (Major)	✓	✓	✓	✓		✓
Molecular Biology & Biotechnology (Major & Minor)	<b>✓</b>	✓	✓	<b>✓</b>		<b>✓</b>
Physics (Major & Minor)	<b>✓</b>	✓	<b>✓</b>	✓		✓
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.

List of BSc Courses and English and

Chinese language courses on offer in 2014-15 and 2015-16

#### SECTION IV List of BSc Courses on offer in 2014/15 and 2015/16^

Course Code	Title	Credit	Pre-requisite	Available in			Exam held in 2014-2015	Quota	Course Coordinator	(The Major/Minor that th	Major / Minor (The Major/Minor that this course appears as a required course)		
						0=year long 1=1st sem 2=2nd sem S=summer			TBC = To be confirmed	Compulsory Course (Must Take)	Core Course (With Choices)		
Departmer	t of Biochemistry												
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, Biochemistry	2012 Major in Biochemistry 2013 Major in Biochemistry 2014 Major in Biochemistry	2012 Minor in Biochemistry 2013 Minor in Biochemistry 2014 Minor in Biochemistry		
BIOC2600	Basic biochemistry	6	Pass in BIOC1600 Perspectives in biochemistry or BIOL1110 From molecules to cells; and Not for students who have passed in BIOL2220 Principles of biochemistry or already enrolled in this course.	Y	Y	1	Dec	300	Prof D K Y Shum, Biochemistry	2012 Major in Biochemistry 2013 Major in Biochemistry 2014 Major in Biochemistry	2012 Major in Molecular Biology & Biotechnology 2012 Minor in Biochemistry 2012 Minor in Molecular Biology & Biotechnology 2013 Major in Molecular Biology & Biotechnology 2013 Minor in Biochemistry 2013 Minor in Molecular Biology & Biotechnology 2014 Major in Molecular Biology & Biotechnology 2014 Minor in Biochemistry 2014 Minor in Molecular Biology & Biotechnology		
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, Biochemistry	2012 Major in Biochemistry 2013 Major in Biochemistry 2014 Major in Biochemistry	2012 Minor in Biochemistry 2013 Minor in Biochemistry 2014 Minor in Biochemistry		
BIOC3602	Understanding metabolism	6	Pass in BIOC3601 Basic Metabolism	N	N			40	Dr L Y L Cheng,				
BIOC3604	diseases Essential techniques in biochemistry and molecular	6	Pass in BIOC2600 Basic biochemistry or BIOL2220 Principles of Biochemistry	Y	Y	2	May	60	Biochemistry  Dr K M Yao,  Biochemistry	2012 Major in Biochemistry 2013 Major in Biochemistry 2014 Major in Biochemistry	2012 Minor in Biochemistry 2013 Minor in Biochemistry		
BIOC3605	biology Sequence bioinformatics	6	Pass in BIOC2600 Basic Biochemistry or BIOL2220 Principles of Biochemistry or BBMS2003 Human genetics or BBMS2007 Essential molecular biology	Y	Y	2	Мау	50	Dr B C W Wong, Biochemistry	2014 Waju III Diocremistry	2014 Minor in Biochemistry 2012 Major in Biochemistry 2012 Minor in Biochemistry 2013 Major in Biochemistry 2013 Minor in Biochemistry 2014 Major in Biochemistry 2014 Minor in Biochemistry		
BIOC3606	Molecular medicine	6	Pass in BIOC2600 Basic Biochemistry or BIOL2220 Principles of Biochemistry	Y	Y	2	May	50	Prof D Y Jin, Biochemistry		2012 Major in Biochemistry 2012 Minor in Biochemistry 2013 Major in Biochemistry 2013 Minor in Biochemistry 2014 Major in Biochemistry 2014 Minor in Biochemistry		
BIOC3999	Directed studies in biochemistry	6	Pass in at least 24 credits of advanced level (level 3 or 4) compulsory/core courses in Biochemistry Major including BIOC2600 Basic biochemistry and BIOL3401 Molecular biology.  This capstone course is for Biochemistry Major students only.	Y	Y	2, S	No exam	36	Dr J D Huang, Biochemistry				
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	N	Y			50	Dr K M Yao, Biochemistry	2012 Major in Biochemistry 2013 Major in Biochemistry 2014 Major in Biochemistry	2012 Minor in Biochemistry 2013 Minor in Biochemistry 2014 Minor in Biochemistry		
BIOC4611	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 I, or already enrolled in this course	N	N			50	Dr D Chan, Biochemistry				

<sup>^</sup> Availability of courses in 2015-2016 is subject to change.

Course Code	Title	Credit	Pre-requisite	Availa	able in		Exam held in 2014-2015		Course Coordinator		ajor / Minor urse appears as a required course)
						0=year long 1=1st sem 2=2nd sem S=summer			TBC = To be confirmed	Compulsory Course (Must Take)	Core Course (With Choices)
•	t of Biochemistry (Cont'd)										
BIOC4612	Molecular biology of the gene		Pass in BIOC3601 Metabolism or BIOL3401 Molecular biology or BIOL3402 Cell biology and cell technology or BIOL3404 Protein structure and function	N	Y			50	Prof K S E Cheah, Biochemistry		2012 Major in Biochemistry 2012 Minor in Biochemistry 2013 Major in Biochemistry 2013 Minor in Biochemistry 2014 Major in Biochemistry 2014 Minor in Biochemistry
BIOC4613	Advanced techniques in biochemistry & molecular biology	6	Pass in BIOC3604 Essential techniques in biochemistry and molecular biology	Y	Y	1	Dec	50	Dr D Chan, Biochemistry	2012 Major in Biochemistry 2013 Major in Biochemistry 2014 Major in Biochemistry	2012 Minor in Biochemistry 2013 Minor in Biochemistry 2014 Minor in Biochemistry
BIOC4966	Biochemistry internship	6	Pass in at least 24 credits of advanced level (level 3 or 4) compulsory/core courses in Biochemistry Major including BIOC3604 Essential techniques in biochemistry & molecular biology. Students are expected to have satisfactorily completed their Year 3 study. This capstone course is for Biochemistry Major students only.	Y	Y	S	No exam	20	Dr J D Huang, Biochemistry		
BIOC4999	Biochemistry project	12	Pass in at least 24 credits of advanced level (level 3 or 4) compulsory/core 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 BIOC4613 Advanced techniques in biochemistry & molecular biology, or already enrolled in this course: This capstone course is for Biochemistry Major students only.	N	Y			25	Dr N S Wong, Biochemistry		
	Protein structure and function	6	Pass in BIOC2600 Basic biochemistry or BIOL2220 Principles of biochemistry	Y	Y	2	May	160	Dr C M Qian, Biochemistry		2012 Major in Biochemistry 2012 Major in Molecular Biology & Biotechnology 2012 Minor in Biochemistry 2013 Major in Biochemistry 2013 Major in Molecular Biology & Biotechnology 2013 Minor in Biochemistry 2014 Major in Biochemistry 2014 Major in Molecular Biology & Biotechnology 2014 Major in Molecular Biology & Biotechnology 2014 Minor in Biochemistry
	Biological Sciences										
BIOL1110	From molecules to cells	6	NIL	Y	Y	1, 2	Dec, May	169	Prof B K C Chow, Biological Sciences	2012 Major in Biochemistry 2012 Major in Biological Sciences 2012 Major in Ecology & Biodiversity 2012 Major in Food & Nutritional Science 2012 Major in Molecular Biology & Biotechnology 2013 Major in Biochemistry 2013 Major in Biological Sciences 2013 Major in Ecology & Biodiversity 2013 Major in Food & Nutritional Science 2013 Major in Molecular Biology & Biotechnology 2014 Major in Biochemistry 2014 Major in Biological Sciences 2014 Major in Ecology & Biodiversity 2014 Major in Ecology & Biodiversity 2014 Major in Food & Nutritional Science 2014 Major in Molecular Biology & Biotechnology	2012 Minor in Biochemistry 2012 Minor in Food & Nutritional Science 2012 Minor in Molecular Biology & Biotechnology 2012 Minor in Plant Science 2013 Minor in Biochemistry 2013 Minor in Food & Nutritional Science 2013 Minor in Molecular Biology & Biotechnology 2013 Minor in Plant Science 2014 Minor in Biochemistry 2014 Minor in Food & Nutritional Science 2014 Minor in Molecular Biology & Biotechnology 2014 Minor in Molecular Biology & Biotechnology 2014 Minor in Plant Science

Course Code	Title	Credit	Pre-requisite	Avail	able in	Semester offered in 2014-2015	Exam held in 2014-2015		Course Coordinator		najor / Minor ourse appears as a required course)
						0=year long 1=1st sem 2=2nd sem S=summer			TBC = To be confirmed	Compulsory Course (Must Take)	Core Course (With Choices)
School of I	Biological Sciences (Cont'o	d)									
BIOL1111	Introductory microbiology	6	NIL	Y	Y	1	Dec	80	Dr V Dvornyk, Biological Sciences	2012 Major in Biological Sciences 2013 Major in Biological Sciences 2014 Major in Biological Sciences	
BIOL1201	Introduction to food and nutrition	6	NIL	Y	Y	1	Dec	110	Prof N P Shah, Biological Sciences	2012 Major in Food & Nutritional Science 2013 Major in Food & Nutritional Science 2014 Major in Food & Nutritional Science	2012 Minor in Food & Nutritional Science 2013 Minor in Food & Nutritional Science 2014 Minor in Food & Nutritional Science
BIOL1309	Evolutionary diversity	6	NIL	Y	Y	2	May	105	Prof R M K Saunders, Biological Sciences	2012 Major in Biological Sciences 2012 Major in Earth System Science 2012 Major in Ecology & Biodiversity 2012 Minor in Ecology & Biodiversity 2013 Major in Biological Sciences 2013 Major in Earth System Science 2013 Major in Ecology & Biodiversity 2013 Major in Ecology & Biodiversity 2014 Major in Ecology & Biodiversity 2014 Major in Biological Sciences 2014 Major in Ecology & Biodiversity 2014 Major in Ecology & Biodiversity 2014 Minor in Ecology & Biodiversity	2012 Minor in Marine Biology 2012 Minor in Plant Science 2013 Minor in Marine Biology 2013 Minor in Plant Science 2014 Minor in Marine Biology 2014 Minor in Plant Science
BIOL1501	Bioethics	6	NIL	N	Υ			40	Prof F C C Leung,		
BIOL1502	The gene	6	NIL Not for students with level 3 or above in HKDSE Biology or Combined Science	N	Y			50	Biological Sciences Prof F C C Leung, Biological Sciences		
BIOL2102	Biostatistics	6	with Biology component or equivalent. 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	2012 Major in Biological Sciences 2012 Major in Ecology & Biodiversity 2012 Major in Food & Nutritional Science 2012 Major in Molecular Biology & Biotechnology 2013 Major in Biological Sciences 2013 Major in Ecology & Biodiversity 2013 Major in Food & Nutritional Science 2013 Major in Molecular Biology & Biotechnology 2014 Major in Biological Sciences 2014 Major in Food & Sciences 2014 Major in Food & Nutritional Science 2014 Major in Food & Nutritional Science	2012 Major in Environmental Science 2012 Minor in Environmental Science 2012 Minor in Molecular Biology & Biotechnology 2013 Major in Environmental Science 2013 Minor in Molecular Biology & Biotechnology 2014 Major in Environmental Science 2014 Minor in Molecular Biology & Biotechnology
BIOL2103	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	2012 Major in Biological Sciences 2012 Major in Ecology & Biodiversity 2012 Major in Food & Nutritional Science 2012 Major in Holecular Biology & Biotechnology 2013 Major in Biological Sciences 2013 Major in Ecology & Biodiversity 2013 Major in Food & Nutritional Science 2013 Major in Molecular Biology & Biotechnology 2014 Major in Biological Sciences 2014 Major in Ecology & Biodiversity 2014 Major in Ecology & Biodiversity 2014 Major in Food & Nutritional Science 2014 Major in Food & Sutritional Science	2012 Minor in Molecular Biology & Biotechnology 2012 Minor in Plant Science 2013 Minor in Molecular Biology & Biotechnology 2013 Minor in Plant Science 2014 Minor in Molecular Biology & Biotechnology 2014 Minor in Plant Science
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	2012 Major in Food & Nutritional Science 2013 Major in Food & Nutritional Science 2014 Major in Food & Nutritional Science	2012 Major in Molecular Biology & Biotechnology 2012 Minor in Food & Nutritional Science 2012 Minor in Molecular Biology & Biotechnology 2012 Minor in Plant Science 2013 Major in Molecular Biology & Biotechnology 2013 Minor in Food & Nutritional Science 2013 Minor in Molecular Biology & Biotechnology 2013 Minor in Molecular Biology & Biotechnology 2014 Minor in Plant Science 2014 Major in Molecular Biology & Biotechnology 2014 Minor in Food & Nutritional Science 2014 Minor in Molecular Biology & Biotechnology 2014 Minor in Plant Science

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	lister at a 10 sign as a 10 sign as					0=year long 1=1st sem 2=2nd sem S=summer			TBC = To be confirmed	Compulsory Course (Must Take)	Core Course (With Choices)
	Biological Sciences (Cont'd										
	Ecology and evolution		Pass in BIOL11309 Evolutionary diversity or BIOL1110 From molecules to cells or ENVS1301 Environmental life science or ENVS1401 Introduction to environmental science		Y	1	Dec		Prof D Dudgeon, Biological Sciences	2012 Major in Biological Sciences 2012 Major in Ecology & Biodiversity 2012 Major in Food & Nutritional Science 2012 Major in Molecular Biology & Biotechnology 2012 Minor in Ecology & Biodiversity 2013 Major in Biological Sciences 2013 Major in Ecology & Biodiversity 2013 Major in Food & Nutritional Science 2013 Major in Molecular Biology & Biotechnology 2013 Minor in Ecology & Biodiversity 2014 Major in Biological Sciences 2014 Major in Ecology & Biodiversity 2014 Major in Food & Nutritional Science 2014 Major in Food & Nutritional Science 2014 Major in Molecular Biology & Biotechnology 2014 Minor in Ecology & Biodiversity	2012 Major in Environmental Science 2012 Minor in Marine Biology 2012 Minor in Molecular Biology & Biotechnology 2013 Major in Environmental Science 2013 Minor in Marine Biology 2013 Minor in Molecular Biology & Biotechnology 2014 Major in Environmental Science 2014 Minor in Marine Biology 2014 Minor in Molecular Biology 2014 Minor in Molecular Biology
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 & evolution	N	Y			40	Prof A O L Wong, Biological Sciences		2012 Major in Biological Sciences 2013 Major in Biological Sciences 2014 Major in Biological Sciences
BIOL3107	Plant physiology	6	Pass in BIOL2103 Biological sciences laboratory course	Y	Y	1	Dec	30	Dr W K Yip, Biological Sciences		2012 Major in Biological Sciences 2012 Minor in Plant Science 2013 Major in Biological Sciences 2013 Minor in Plant Science 2014 Major in Biological Sciences 2014 Minor in Plant Science
BIOL3108	Microbial physiology	6	Pass in BIOL2103 Biological sciences laboratory course	Y	Y	1	Dec	50	Dr A Yan, Biological Sciences		2012 Major in Biological Sciences 2013 Major in Biological Sciences 2014 Major in Biological Sciences
BIOL3109	Environmental microbiology	6	Pass in BIOL2103 Biological sciences laboratory course	Y	Y	2	Мау	40	Dr J D Gu, Biological Sciences		2012 Major in Biological Sciences 2012 Major in Ecology & Biodiversity 2013 Major in Biological Sciences 2013 Major in Ecology & Biodiversity 2014 Major in Biological Sciences 2014 Major in Ecology & Biodiversity
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		2012 Major in Biological Sciences 2012 Major in Environmental Science 2012 Major in Environmental Science 2013 Major in Environmental Science 2013 Major in Environmental Science 2013 Major in Environmental Science 2014 Major in Biological Sciences 2014 Major in Environmental Science 2014 Major in Environmental Science 2014 Mijor in Environmental Science
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	2012 Major in Food & Nutritional Science 2013 Major in Food & Nutritional Science 2014 Major in Food & Nutritional Science	2012 Minor in Food & Nutritional Science 2013 Minor in Food & Nutritional Science 2014 Minor in Food & Nutritional Science
BIOL3202	Nutritional biochemistry	6	Pass in BIOL2220 Principles of biochemistry or BIOC2600 Basic biochemistry	Y	Y	1	Dec	100	Dr E T S Li, Biological Sciences	2012 Major in Food & Nutritional Science 2013 Major in Food & Nutritional Science 2014 Major in Food & Nutritional Science	2012 Major in Biochemistry 2012 Minor in Biochemistry 2012 Minor in Food & Nutritional Science 2013 Major in Biochemistry 2013 Minor in Biochemistry 2013 Minor in Food & Nutritional Science 2014 Major in Biochemistry 2014 Minor in Biochemistry 2014 Minor in Biochemistry 2014 Minor in Food & Nutritional Science
BIOL3203	Food microbiology	6	Pass in BIOC2600 Basic biochemistry or BIOL2220 Principles of biochemistry	Y	Y	2	May	60	Dr H S El-Nezami, Biological Sciences	2012 Major in Food & Nutritional Science 2013 Major in Food & Nutritional Science 2014 Major in Food & Nutritional Science	2012 Minor in Food & Nutritional Science 2013 Minor in Food & Nutritional Science 2014 Minor in Food & Nutritional Science

Course Code	Title	Credit	Pre-requisite	Availa	able in	Semester offered in	Exam held in 2014-2015		Course Coordinator		jor / Minor se appears as a required course)
Cabaal of I	Right rical Sciences (Control					2014-2015 0=year long 1=1st sem 2=2nd sem S=summer			TBC = To be confirmed	Compulsory Course (Must Take)	Core Course (With Choices)
	Biological Sciences (Cont'd		I=			-					
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		2012 Major in Food & Nutritional Science 2012 Minor in Food & Nutritional Science 2013 Major in Food & Nutritional Science 2013 Minor in Food & Nutritional Science 2014 Major in Food & Nutritional Science 2014 Minor in Fo
BIOL3205	Human physiology	6	Pass in BIOL2103 Biological sciences laboratory course	Y	Y	1	Dec	120	Dr W Y Lui, Biological Sciences		2012 Major in Biological Sciences 2012 Major in Food & Nutritional Science 2012 Minor in Food & Nutritional Science 2013 Major in Biological Sciences 2013 Major in Food & Nutritional Science 2013 Minor in Food & Nutritional Science 2014 Major in Biological Sciences 2014 Major in Food & Nutritional Science 2014 Major in Food & Nutritional Science 2014 Minor in Food & Nutritional Science
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		2012 Major in Food & Nutritional Science 2012 Minor in Food & Nutritional Science 2013 Major in Food & Nutritional Science 2013 Minor in Food & Nutritional Science 2014 Major in Food & Nutritional Science 2014 Minor in Fo
BIOL3207	Food and nutritional toxicology	6	Pass in BIOC2600 Basic biochemistry or BIOL2220 Principles of biochemistry or BIOL3205 Human physiology	Y	Y	2	Мау	80	Dr H S El-Nezami, Biological Sciences		2012 Major in Food & Nutritional Science 2012 Minor in Food & Nutritional Science 2013 Major in Food & Nutritional Science 2013 Minor in Food & Nutritional Science 2014 Major in Food & Nutritional Science 2014 Minor in Food & Nutritional Science
BIOL3208	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		2012 Major in Food & Nutritional Science 2012 Minor in Food & Nutritional Science 2013 Major in Food & Nutritional Science 2013 Minor in Food & Nutritional Science 2014 Major in Food & Nutritional Science 2014 Minor in Fo
BIOL3209	Food and nutrient analysis	6	Pass in BIOL3201 Food chemistry	Y	Y	1	Dec	70	Dr M F Wang, Biological Sciences		2012 Major in Food & Nutritional Science 2012 Minor in Food & Nutritional Science 2013 Major in Food & Nutritional Science 2013 Minor in Food & Nutritional Science 2014 Major in Food & Nutritional Science 2014 Minor in Fo
BIOL3210	Grain production and utilization	6	Pass in any level 2 BIOL course	Y	Y	1	Dec	40	Prof H Corke, Biological Sciences		2012 Major in Food & Nutritional Science 2012 Minor in Food & Nutritional Science 2012 Minor in Plant Science 2013 Major in Food & Nutritional Science 2013 Minor in Food & Nutritional Science 2013 Minor in Plant Science 2014 Major in Food & Nutritional Science 2014 Minor in Food & Nutritional Science 2014 Minor in Food & Nutritional Science 2014 Minor in Plant Science
BIOL3211	Nutrigenomics	6	Pass in BIOC2600 Basic biochemistry or BIOL2220 Principles of biochemistry	Y	Y	2	May	40	Dr K C Tan-Un, Biological Sciences		2012 Major in Food & Nutritional Science 2012 Minor in Food & Nutritional Science 2013 Major in Food & Nutritional Science 2013 Minor in Food & Nutritional Science 2014 Major in Food & Nutritional Science 2014 Minor in Fo

Course Code	Title	Credit	Pre-requisite	Avail	able in	Semester offered in 2014-2015	in 2014-2015		Course Coordinator	(The Major/Minor that th	Major / Minor is course appears as a required course)
						0=year long 1=1st sem 2=2nd sem S=summer			TBC = To be confirmed	Compulsory Course (Must Take)	Core Course (With Choices)
	Biological Sciences (Cont										
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	2012 Minor in Marine Biology 2013 Minor in Marine Biology 2014 Minor in Marine Biology	2012 Major in Biological Sciences 2012 Major in Ecology & Biodiversity 2012 Minor in Ecology & Biodiversity 2013 Major in Biological Sciences 2013 Major in Ecology & Biodiversity 2013 Minor in Ecology & Biodiversity 2014 Major in Biological Sciences 2014 Major in Ecology & Biodiversity 2014 Minor in Ecology & Biodiversity
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	2012 Major in Ecology & Biodiversity 2013 Major in Ecology & Biodiversity 2014 Major in Ecology & Biodiversity	2012 Major in Biological Sciences 2012 Minor in Ecology & Biodiversity 2013 Major in Biological Sciences 2013 Minor in Ecology & Biodiversity 2014 Major in Biological Sciences 2014 Minor in Ecology & Biodiversity
BIOL3303	Conservation ecology	6	Pass in BIOL2306 Ecology and evolution	Y	Y	2	May	40	Dr T C Bonebrake, Biological Sciences	2012 Major in Ecology & Biodiversity 2013 Major in Ecology & Biodiversity 2014 Major in Ecology & Biodiversity	2012 Major in Biological Sciences 2012 Major in Environmental Science 2012 Minor in Ecology & Biodiversity 2012 Minor in Environmental Science 2012 Minor in Marine Biology 2013 Major in Biological Sciences 2013 Major in Ervironmental Science 2013 Minor in Ecology & Biodiversity 2013 Minor in Environmental Science 2013 Minor in Biology 2014 Major in Biological Sciences 2014 Major in Biological Sciences 2014 Minor in Ecology & Biodiversity 2014 Minor in Ecology & Biodiversity 2014 Minor in Ervironmental Science 2014 Minor in Ervironmental Science
BIOL3313	Freshwater ecology	6	Pass in BIOL2102 Biostatistics and BIOL2306 Ecology and evolution	Y	Y	1	Dec	30	Prof D Dudgeon, Biological Sciences		2012 Major in Ecology & Biodiversity 2012 Minor in Ecology & Biodiversity 2013 Major in Ecology & Biodiversity 2013 Minor in Ecology & Biodiversity 2014 Major in Ecology & Biodiversity 2014 Minor in Ecology & Biodiversity
BIOL3314	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		2012 Major in Ecology & Biodiversity 2012 Minor in Ecology & Biodiversity 2012 Minor in Plant Science 2013 Major in Ecology & Biodiversity 2013 Minor in Ecology & Biodiversity 2013 Minor in Ecology & Biodiversity 2014 Mi
	Experimental intertidal ecology		Pass in BIOL2102 Biostatistics or BIOL3301 Marine biology	Y	Y	2	May		Prof G A Williams, Biological Sciences		2012 Major in Ecology & Biodiversity 2012 Minor in Ecology & Biodiversity 2012 Minor in Marine Biology 2013 Major in Ecology & Biodiversity 2013 Minor in Ecology & Biodiversity 2013 Minor in Marine Biology 2014 Major in Ecology & Biodiversity 2014 Minor in Ecology & Biodiversity 2014 Minor in Ecology & Biodiversity 2014 Minor in Marine Biology
BIOL3319	Terrestrial ecology	6	Pass in BIOL3303 Conservation ecology	Y	Y	2	May	30	Dr B Guenard, Biological Sciences		2012 Major in Ecology & Biodiversity 2012 Minor in Ecology & Biodiversity 2013 Major in Ecology & Biodiversity 2013 Minor in Ecology & Biodiversity 2014 Major in Ecology & Biodiversity 2014 Minor in Ecology & Biodiversity

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						2014-2015 0=year long 1=1st sem 2=2nd sem S=summer			TBC = To be confirmed	Compulsory Course (Must Take)	Core Course (With Choices)
School of E	Biological Sciences (Cont'd	d)									
	The biology of marine mammals		Pass in BIOL2306 Ecology and evolution		Y				Dr L Karczmarski, Biological Sciences		2012 Major in Ecology & Biodiversity 2012 Minor in Ecology & Biodiversity 2012 Minor in Marine Biology 2013 Major in Ecology & Biodiversity 2013 Minor in Ecology & Biodiversity 2013 Minor in Marine Biology 2014 Major in Ecology & Biodiversity 2014 Minor in Ecology & Biodiversity 2014 Minor in Ecology & Biodiversity 2014 Minor in Marine Biology
BIOL3401	Molecular biology	6	Pass in BIOL2103 Biological sciences laboratory course or BIOL2220 Principles of biochemistry or BIOC2600 Basic biochemistry	Y	Y	1	Dec	130	Prof B K C Chow, Biological Sciences	2012 Major in Biochemistry 2012 Major in Molecular Biology & Biotechnology 2012 Minor in Molecular Biology & Biotechnology 2013 Major in Biochemistry 2013 Major in Molecular Biology & Biotechnology 2013 Minor in Molecular Biology & Biotechnology 2014 Major in Biochemistry 2014 Major in Molecular Biology & Biotechnology 2014 Minor in Molecular Biology & Biotechnology 2014 Minor in Molecular Biology & Biotechnology	2012 Major in Biological Sciences 2012 Minor in Biochemistry 2013 Major in Biological Sciences 2013 Minor in Biochemistry 2014 Major in Biological Sciences 2014 Minor in Biochemistry
BIOL3402	Cell biology and cell technology	6	Pass in BIOL2103 Biological sciences laboratory course or BIOL2220 Principles of biochemistry or BIOC2600 Basic biochemistry	Y	Y	1	Dec	120	Prof A S T Wong, Biological Sciences	2012 Major in Molecular Biology & Biotechnology 2013 Major in Molecular Biology & Biotechnology 2014 Major in Molecular Biology & Biotechnology	2012 Major in Biochemistry 2012 Major in Biological Sciences 2012 Minor in Biochemistry 2012 Minor in Molecular Biology & Biotechnology 2013 Major in Biochemistry 2013 Major in Biological Sciences 2013 Minor in Biochemistry 2013 Minor in Molecular Biology & Biotechnology 2014 Major in Biological Sciences 2014 Major in Biological Sciences 2014 Minor in Biochemistry 2014 Minor in Biochemistry 2014 Minor in Molecular Biology & Biotechnology
BIOL3403	Immunology	6	Pass in BIOC2600 Basic biochemistry or BIOL2220 Principles of biochemistry or BIOL2103 Biological sciences laboratory course	Y	Y	2	May	100	Dr B L Lim, Biological Sciences		2012 Major in Biochemistry 2012 Major in Biochemistry 2012 Major in Biochemistry 2012 Minor in Biochemistry 2012 Minor in Biochemistry 2012 Minor in Biochemistry 2013 Major in Biochemistry 2013 Minor in Biochemistry 2013 Minor in Biochemistry 2014 Major in Biochemistry 2014 Major in Biochemistry 2014 Major in Biological Sciences 2014 Major in Molecular Biology & Biotechnology 2014 Major in Molecular Biology & Biotechnology 2014 Minor in Biochemistry 2014 Minor in Biochemistry 2014 Minor in Molecular Biology & Biotechnology
BIOL3405	Molecular microbiology	6	Pass in BIOL2103 Biological sciences laboratory course	Y	Y	2	May	30	Dr J S H Tsang, Biological Sciences		2012 Major in Molecular Biology & Biotechnology 2013 Major in Molecular Biology & Biotechnology 2013 Major in Molecular Biology & Biotechnology 2014 Major in Molecular Biology & Biotechnology
BIOL3406	Reproduction and reproductive biotechnology	6	Pass in BIOL2103 Biological sciences laboratory course or BIOL2220 Principles of biochemistry or BIOL2102 Biostatistics or BIOL2306 Ecology & evolution	Y	Y	1	Dec	30	Prof A O L Wong, Biological Sciences		2012 Major in Molecular Biology & Biotechnology 2013 Major in Molecular Biology & Biotechnology 2014 Major in Molecular Biology & Biotechnology

Course Code	Title	Credit	Pre-requisite	Avail	able in	Semester offered in 2014-2015	Exam held in 2014-2015		Course Coordinator		ajor / Minor urse appears as a required course)
School of I	Biological Sciences (Cont'd					0=year long 1=1st sem 2=2nd sem S=summer			TBC = To be confirmed	Compulsory Course (Must Take)	Core Course (With Choices)
BIOL3408			Pass in BIOL2103 Biological sciences	Υ	Υ	1	Dec	50	Dr C S C Lo,		2012 Major in Biochemistry
			laboratory course						Biological Sciences		2012 Major in Biological Sciences 2012 Major in Molecular Biology & Biotechnology 2012 Minor in Plant Science 2013 Major in Biochemistry 2013 Major in Biological Sciences 2013 Major in Molecular Biology & Biotechnology 2013 Minor in Plant Science 2014 Major in Biological Sciences 2014 Major in Biological Sciences 2014 Major in Molecular Biology & Biotechnology 2014 Minor in Plant Science
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		2012 Major in Biological Sciences 2012 Major in Molecular Biology & Biotechnology 2012 Minor in Molecular Biology & Biotechnology 2013 Major in Biological Sciences 2013 Major in Molecular Biology & Biotechnology 2013 Minor in Molecular Biology & Biotechnology 2014 Major in Biological Sciences 2014 Major in Molecular Biology & Biotechnology 2014 Minor in Molecular Biology & Biotechnology
BIOL3501	Evolution	6	Pass in BIOL2306 Ecology and evolution	Y	Y	1	Dec	50	Dr M Sun, Biological Sciences		
BIOL3502	Conservation genetics	6	Pass in BIOL2306 Ecology and evolution or BIOL3303 Conservation ecology or BIOL3408 Genetics	N	Y			50	Dr M Sun, Biological Sciences		
BIOL3503	Endocrinology: human physiology II	6	Pass in BIOL2103 Biological sciences laboratory course	N	Y			120	Prof B K C Chow, Biological Sciences		
BIOL3505	Larval life science: an interdisciplinary approach	6	Passed in at least 24 credits of BIOL2XXX level courses	N	N			30	Dr T Vengatesen, Biological Sciences		
BIOL3951	Ecology & biodiversity field course	6	Pass in at least 24 credits of advanced level biological sciences courses (BIOL3XXX or BIOL4XXX) in the Ecolony & Biodiversity Maior. Students are expected to have completed year 2 study satisfactorily. This capstone course is for Ecology & Biodiversity Major students only.	Y	Y	2	No exam	22	Biological Sciences  Dr L Karczmarski,  Biological Sciences		
BIOL3991	Directed studies in ecology & biodiversity	6	Pass in at least 24 credits of advanced level biological sciences courses (BIOL3XXX or BIOL4XXX) in the Ecology & Biodiversity Major. This capstone course is for Ecology & Biodiversity Major students only.	N	Y			50	Dr M Sun, Biological Sciences		
BIOL3992	Directed studies in food & nutritional science	6	Pass in at least 24 credits of advanced level biological sciences courses (BIOL3XXX or BIOL4XXX) in the Food & Nutritional Science Major. This capstone course is for Food & Nutritional Science Major students only.	N	Y			50	Dr M Sun, Biological Sciences		
BIOL3993	Directed studies in Molecular biology & biotechnology	6	Pass in at least 24 credits of advanced level biological sciences courses (BIOL3XXX or BIOL4XXX) in the Molecular Biology & Biotechnology Major. This capstone course is for Molecular Biology & Biotechnology Major students only.	N	Y			50	Dr M Sun, Biological Sciences		

Course Code	Title	Credi	Pre-requisite	Avail	able in	Semester offered in 2014-2015	Exam held in 2014-2015		Course Coordinator		ajor / Minor rse appears as a required course)
School of I	Biological Sciences (Cont'd	4)				0=year long 1=1st sem 2=2nd sem S=summer			TBC = To be confirmed	Compulsory Course (Must Take)	Core Course (With Choices)
	Directed studies in biological sciences		Pass in at least 24 credits of advanced level biological sciences courses (BIOL3XXX or BIOL4XXX) in the Biological Sciences Major. This capstone course is for Biological Sciences Major students only.	Y	Y	0	No exam	50	Dr M Sun, Biological Sciences		
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		2012 Major in Food & Nutritional Science 2012 Minor in Food & Nutritional Science 2013 Major in Food & Nutritional Science 2013 Minor in Food & Nutritional Science 2014 Major in Food & Nutritional Science 2014 Minor in Fo
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		2012 Major in Food & Nutritional Science 2012 Minor in Food & Nutritional Science 2013 Major in Food & Nutritional Science 2013 Minor in Food & Nutritional Science 2014 Major in Food & Nutritional Science 2014 Minor in Fo
BIOL4205	Food processing and engineering	6	Pass in BIOL3201 Food chemistry	Y	Y	1	Dec	60	Dr J C Y Lee, Biological Sciences		2012 Major in Food & Nutritional Science 2012 Minor in Food & Nutritional Science 2013 Major in Food & Nutritional Science 2013 Minor in Food & Nutritional Science 2014 Major in Food & Nutritional Science 2014 Minor in Fo
BIOL4207	Meat and dairy sciences	6	Pass in BIOL3201 Food chemistry	Y	Y	2	May	50	Prof N P Shah, Biological Sciences		2012 Major in Food & Nutritional Science 2012 Minor in Food & Nutritional Science 2013 Major in Food & Nutritional Science 2013 Minor in Food & Nutritional Science 2014 Major in Food & Nutritional Science 2014 Minor in Fo
BIOL4209	Functional foods	6	Pass in BIOL3201 Food chemistry or BIOL3202 Nutritional biochemistry	Y	Y	1	Dec	40	Dr M F Wang, Biological Sciences		2012 Major in Food & Nutritional Science 2012 Minor in Food & Nutritional Science 2012 Minor in Plant Science 2013 Major in Food & Nutritional Science 2013 Minor in Food & Nutritional Science 2013 Minor in Plant Science 2014 Major in Food & Nutritional Science 2014 Minor in Food & Nutritional Science 2014 Minor in Food & Nutritional Science
BIOL4210	Food product development	6	Pass in BIOL3203 Food microbiology or BIOL4205 Food processing and engineering	Y	Y	1	Dec	40	Dr M F Wang, Biological Sciences		2012 Major in Food & Nutritional Science 2012 Minor in Food & Nutritional Science 2013 Major in Food & Nutritional Science 2013 Minor in Food & Nutritional Science 2014 Major in Food & Nutritional Science 2014 Minor in Fo
BIOL4301	Fish and fisheries	6	Pass in BIOL3301 Marine biology or BIOL3303 Conservation ecology	Y	Y	2	May	30	Prof Y J Sadovy, Biological Sciences		2012 Major in Biological Sciences 2012 Major in Ecology & Biodiversity 2012 Minor in Ecology & Biodiversity 2012 Minor in Marine Biology 2013 Major in Biological Sciences 2013 Major in Ecology & Biodiversity 2013 Minor in Ecology & Biodiversity 2013 Minor in Marine Biology 2014 Major in Ecology & Biodiversity 2014 Major in Ecology & Biodiversity 2014 Major in Ecology & Biodiversity 2014 Minor in Ceology & Biodiversity 2014 Minor in Calogy & Biodiversity 2014 Minor in Marine Biology

Course Code	Title	Credit	Pre-requisite	Avail	able in	Semester offered in 2014-2015	Exam held in 2014-2015		Course Coordinator		najor / Minor ourse appears as a required course)
Cabaal of I	Pialogical Salaman (Control					0=year long 1=1st sem 2=2nd sem S=summer			TBC = To be confirmed	Compulsory Course (Must Take)	Core Course (With Choices)
	Biological Sciences (Cont'd Environmental impact assessment		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	Prof R S S Wu, Biological Sciences		2012 Major in Ecology & Biodiversity 2012 Major in Environmental Science 2012 Minor in Ecology & Biodiversity 2012 Minor in Environmental Science 2013 Major in Environmental Science 2013 Major in Environmental Science 2013 Minor in Ecology & Biodiversity 2013 Minor in Environmental Science 2014 Major in Environmental Science 2014 Major in Environmental Science 2014 Major in Environmental Science 2014 Minor in Ecology & Biodiversity
BIOL4303	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 BIOL3320 The biology of marine mammals	Y	N	1	Dec	30	Dr L Karczmarski, Biological Sciences		2014 Minor in Environmental Science 2012 Major in Ecology & Biodiversity 2012 Minor in Ecology & Biodiversity 2013 Major in Ecology & Biodiversity 2013 Minor in Ecology & Biodiversity 2014 Major in Ecology & Biodiversity 2014 Minor in Ecology & Biodiversity
BIOL4401	Medical microbiology and applied immunology	6	Pass in BIOL3403 Immunology	Y	Y	2	May	40	Dr W Y Lui, Biological Sciences		2012 Major in Biological Sciences 2012 Major in Molecular Biology & Biotechnology 2012 Minor in Molecular Biology & Biotechnology 2013 Major in Biological Sciences 2013 Major in Molecular Biology & Biotechnology 2013 Minor in Molecular Biology & Biotechnology 2014 Major in Biological Sciences 2014 Major in Molecular Biology & Biotechnology 2014 Minor in Molecular Biology & Biotechnology 2014 Minor in Molecular Biology & Biotechnology
BIOL4402	Microbial biotechnology	6	Pass in BIOL3401 Molecular biology	Y	Y	2	May	30	Dr J S H Tsang, Biological Sciences	2012 Major in Molecular Biology & Biotechnology 2013 Major in Molecular Biology & Biotechnology 2014 Major in Molecular Biology & Biotechnology	2014 Millor in Molecular Biology & Biotechnology 2013 Minor in Molecular Biology & Biotechnology 2013 Minor in Molecular Biology & Biotechnology 2014 Minor in Molecular Biology & Biotechnology
BIOL4409	General virology	6	Pass in BIOL3401 Molecular biology or BIOL3403 Immunology	Y	Y	1	Dec	30	Dr B L Lim, Biological Sciences	, J	2012 Major in Molecular Biology & Biotechnology 2013 Major in Molecular Biology & Biotechnology 2014 Major in Molecular Biology & Biotechnology
BIOL4411	Plant and food biotechnology	6	Pass in BIOL3401 Molecular biology or BIOL3211 Nutrigenomics	N	Y			80	Prof M L Chye, Biological Sciences	2012 Major in Molecular Biology & Biotechnology 2013 Major in Molecular Biology & Biotechnology 2014 Major in Molecular Biology & Biotechnology	2012 Major in Food & Nutritional Science 2012 Minor in Food & Nutritional Science 2012 Minor in Food & Nutritional Science 2012 Minor in Molecular Biology & Biotechnology 2012 Minor in Food & Nutritional Science 2013 Minor in Food & Nutritional Science 2013 Minor in Molecular Biology & Biotechnology 2013 Minor in Plant Science 2014 Major in Food & Nutritional Science 2014 Minor in Food & Nutritional Science 2014 Minor in Molecular Biology & Biotechnology 2014 Minor in Molecular Biology & Biotechnology 2014 Minor in Plant Science
BIOL4415	Healthcare biotechnology	6	Pass in BIOL3401 Molecular biology	Y	Y	2	May	70	Prof A S T Wong, Biological Sciences	2012 Major in Molecular Biology & Biotechnology 2013 Major in Molecular Biology & Biotechnology 2014 Major in Molecular Biology & Biotechnology	2012 Minor in Molecular Biology & Biotechnology 2013 Minor in Molecular Biology & Biotechnology 2014 Minor in Molecular Biology & Biotechnology
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	N	2	May	40	Dr K W Y Yuen, Biological Sciences	, and the second	2012 Major in Molecular Biology & Biotechnology 2012 Minor in Molecular Biology & Biotechnology 2013 Major in Molecular Biology & Biotechnology 2013 Minor in Molecular Biology & Biotechnology 2014 Major in Molecular Biology & Biotechnology 2014 Minor in Molecular Biology & Biotechnology

Course Code	Title	Credit		Avail	able in	Semester offered in 2014-2015	Exam held in 2014-2015		Course Coordinator		jor / Minor se appears as a required course)
Cabaal at I	Biological Sciences (Cont'd	1				0=year long 1=1st sem 2=2nd sem S=summer			TBC = To be confirmed	Compulsory Course (Must Take)	Core Course (With Choices)
	'Omics' and systems biology		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 J W Zhang, Biological Sciences		2012 Major in Biochemistry 2012 Major in Molecular Biology & Biotechnology 2012 Minor in Biochemistry 2012 Minor in Molecular Biology & Biotechnology 2013 Major in Biochemistry 2013 Major in Molecular Biology & Biotechnology 2013 Minor in Biochemistry 2013 Minor in Molecular Biology & Biotechnology 2014 Major in Molecular Biology & Biotechnology 2014 Major in Molecular Biology & Biotechnology 2014 Minor in Biochemistry 2014 Minor in Biochemistry 2014 Minor in Molecular Biology & Biotechnology
BIOL4501	Molecular phylogenetics and evolution	6	Pass in BIOL3401 Molecular biology or BIOL3408 Genetics	N	Y			25	Dr V Dvornyk, Biological Sciences		
BIOL4861	Ecology & biodiversity internship	6	Students are expected to have satisfactorily completed their Year 3 study. This course is for Ecology & Biodiversity Maior students only.	Y	Y	2, S	No exam		Dr T Vengatesen, Biological Sciences		
BIOL4911	Conservation science in practice	6	level biological sciences courses (BIOL3XXX or BIOL4XXX) including BIOL3303 Conservation ecology. This capstone course is for Ecology & Biodiversity Major students only.	Y	Y	2	Мау	15	Prof Y J Sadovy, Biological Sciences		
BIOL4962	Food & nutritional science internship	6	Pass in at least 24 credits of advanced level biological sciences courses courses (BIOL3XXX or BIOL4XXX) in the Food & Nutritional Science Major. Students are expected to have satisfactorily completed their Year 3 study.  This capstone course is for Food & Nutritional Science Major students only.	Y	Y	2, S	No exam		Dr J C Y Lee, Biological Sciences		
BIOL4963	Molecular biology & biotechnology internship	6	Pass in at least 24 credits of advanced level biological sciences courses (BIOL3XXX or BIOL4XXX) in the Molecular Biology & Biotechnology Major. Students are expected to have satisfactorily completed their Year 3 study. This capstone course is for Molecular Biology & Biotechnology Major students only.	Y	Y	2, S	No exam		Dr T Vengatesen, Biological Sciences		
BIOL4964	Biological sciences internship	6	Pass in at least 24 credits of advanced level biological sciences courses (BIOL3XXX or BIOL4XXX) in the Biological Sciences Major. Students are expected to have satisfactorily completed their Year 3 study. This captsone course is for Biological Sciences Major students only.	Y	Y	2, S	No exam		Dr T Vengatesen, Biological Sciences		

Course Code	Title	Credit	Pre-requisite	Avail	able in	Semester offered in 2014-2015	Exam held in 2014-2015		Course Coordinator		lajor / Minor urse appears as a required course)
						0=year long 1=1st sem 2=2nd sem S=summer			TBC = To be confirmed	Compulsory Course (Must Take)	Core Course (With Choices)
	Siological Sciences (Cont'd										
	Ecology & biodiversity project		Pass in at least 24 credits of advanced level 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.	N	Y			30	Prof G A Williams, Biological Sciences		
BIOL4992	Food & nutritional science project	12	Pass in at least 24 credits of advanced level 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.	N	Y			30	Prof G A Williams, Biological Sciences		
BIOL4993	Molecular biology & biotechnology project	12	Pass in at least 24 credits of advanced level 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 only.	N	Y			30	Prof G A Williams, Biological Sciences		
BIOL4994	Biological sciences project	12	Pass in at least 24 credits of advanced level 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.	N	Y			30	Prof G A Williams, Biological Sciences		
ENVS1301	Environmental life science	6	NIL	Y	Y	1	Dec	40	Dr T Vengatesen, Biological Sciences		2012 Major in Environmental Science 2012 Minor in Environmental Science 2012 Minor in Marine Biology 2013 Major in Environmental Science 2013 Minor in Environmental Science 2013 Minor in Marine Biology 2014 Major in Environmental Science 2014 Minor in Environmental Science 2014 Minor in Environmental Science 2014 Minor in Marine Biology
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	2013 Major in Environmental Science 2014 Major in Environmental Science	2012 Major in Environmental Science 2012 Minor in Environmental Science 2013 Minor in Environmental Science 2014 Minor in Environmental Science
ENVS2002	Environmental data analysis		Pass in ENVS1301 Environmental life science or ENVS1401 Introduction to environmental science or EASC1401 Blue planet or BIOL1309 Evolutionary diversity	Y	Y	2	Мау	50	Dr T C Bonebrake, Biological Sciences	2013 Major in Ecology & Biodiversity 2013 Major in Envirohnmental Science 2014 Major in Ecology & Biodiversity 2014 Major in Environmental Science	2012 Major in Environmental Science 2012 Minor in Environmental Science 2013 Minor in Environmental Science 2014 Minor in Environmental Science
ENVS3019	Urban ecology	6	Pass in ENVS2001 Environmental field and lab course or ENVS2002 Environmental data analysis or BIOL2306 Ecology and evolution	N	Y			50	Dr T C Bonebrake, Biological Sciences		2012 Major in Ecology & Biodiversity 2012 Major in Environmental Science 2012 Minor in Environmental Science 2013 Major in Ecology & Biodiversity 2013 Major in Environmental Science 2013 Minor in Environmental Science 2014 Major in Ecology & Biodiversity 2014 Major in Ecology & Biodiversity 2014 Major in Environmental Science 2014 Minor in Environmental Science

Course Code	Title	Credit	Pre-requisite	Availa	able in	Semester offered in 2014-2015	Exam held in 2014-2015		Course Coordinator	(The Major/Minor that this	Major / Minor course appears as a required course)
						0=year long 1=1st sem 2=2nd sem S=summer			TBC = To be confirmed	Compulsory Course (Must Take)	Core Course (With Choices)
	Biological Sciences (Cont'd										
ENV\$3020	Global change ecology	6	Pass in ENVS2001 Environmental field and lab course or ENVS2002 Environmental data analysis or BIOL2306 Ecology and evolution	Y	N	2	May		Dr C Dingle, Biological Sciences		2012 Major in Environmental Science 2012 Minor in Environmental Science 2013 Major in Environmental Science 2013 Minor in Environmental Science 2014 Major in Environmental Science 2014 Minor in Environmental Science
	Environmental remediation		Pass in BIOL3109 Environmental microbiology or BIOL3110 Environmental toxicology or BIOL3401 Molecular biology or ENVS3042 Pollution	N	Y				Dr J D Gu, Biological Sciences		2012 Major in Environmental Science 2012 Major in Molecular Biology & Biotechnology 2012 Minor in Environmental Science 2012 Minor in Molecular Biology & Biotechnology 2013 Major in Environmental Science 2013 Major in Molecular Biology & Biotechnology 2013 Minor in Environmental Science 2013 Minor in Environmental Science 2014 Major in Environmental Science 2014 Major in Molecular Biology & Biotechnology 2014 Minor in Molecular Biology & Biotechnology 2014 Minor in Molecular Biology & Biotechnology 2014 Minor in Molecular Biology & Biotechnology
ENVS4955	Environmental science in practice	6	Pass in at least 24 credits of advanced level (level 3 or 4) compulsory/core courses in Environmental Science Major. Students are expected to have satisfactorily completed their Year 3 study in Environmental Science Major. This capstone course is for Environmental Science Major students only.	N	Y			18	Dr M Yasuhara, Biological Sciences		
ENVS4966	Environmental science internship		Pass in at least 24 credits of advanced level (level 3 or 4) compulsory/core courses in Environmental Science Major. Students are expected to have satisfactorily completed their Year 3 study in Environmental Science Major. This capstone course is for Environmental Science Major students only.	Y	Y	2, S	No exam		Dr C Dingle, Biological Sciences		
Centre for	Applied English Studies			-					-		
CAES1000	Core University English	6	NIL	Y	Y	1, 2	Dec, May		Dr M Legg (1st sem); Dr N Fong (2nd sem), English		
	Academic English for science students	6	NIL	Y	Y	1, 2	No exam		Mr S Boynton, English		
-	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	150	Dr A P L Tong, Chemistry		

Course Code	Title	Credit	Pre-requisite	Avail	able in		Exam held in 2014-2015		Course Coordinator	(The Major/Minor that thi	Major / Minor is course appears as a required course)
						0=year long 1=1st sem 2=2nd sem S=summer			TBC = To be confirmed	Compulsory Course (Must Take)	Core Course (With Choices)
	t of Chemistry (Cont'd) General chemistry	6	Level 3 or above in HKDSE Chemistry or	Υ	Y	1, 2	Dec, May	260	Dr A P L Tong,	2012 Major in Biochemistry	2012 Major in Environmental Science
	,		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.						Chemistry	2012 Major in Chemistry 2012 Minor in Chemistry 2013 Major in Biochemistry 2013 Major in Chemistry 2013 Minor in Chemistry 2014 Major in Biochemistry 2014 Major in Chemistry 2014 Minor in Chemistry	2012 Minor in Environmental Science 2013 Major in Environmental Science 2013 Minor in Environmental Science 2014 Major in Environmental Science 2014 Minor in Environmental Science
CHEM2041	Principles of chemistry		Pass in CHEM1042 General chemistry; 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 Physical chemistry I, or have already enrolled in this course; and Not for Chemistry major students.	N	Y			280	Dr I K Chu, Chemistry		2012 Major in Environmental Science 2012 Minor in Chemistry 2012 Minor in Environmental Science 2013 Major in Environmental Science 2013 Minor in Chemistry 2013 Minor in Environmental Science 2014 Major in Environmental Science 2014 Minor in Chemistry 2014 Major in Environmental Science
CHEM2042	Principles of chemistry for pharmacy students	6	Pass in CHEM1042 General chemistry; and Not for students who have passed in CHEM2041 Prinicples of chemistry, or already enrolled in this course. (This course is for BPharm students only)	N	N			30	Dr A M Y Yuen, Chemistry		
CHEM2241	Analytical chemistry I	6	Pass in CHEM1042 General chemistry	Y	Y	1, 2	Dec, May	100	Dr W T Chan, Chemistry	2012 Major in Chemistry 2013 Major in Chemistry 2014 Major in Chemistry	2012 Minor in Chemistry 2013 Minor in Chemistry 2014 Minor in Chemistry
CHEM2341	Inorganic chemistry I	6	Pass in CHEM1042 General chemistry; and Not for students who have passed in CHEM2041 Principles of chemistry or have already enrolled in this course.	Y	Y	1, 2	Dec, May	120	Prof V W W Yam, Chemistry	2012 Major in Chemistry 2013 Major in Chemistry 2014 Major in Chemistry	2012 Minor in Chemistry 2013 Minor in Chemistry 2014 Minor in Chemistry
CHEM2441	Organic chemistry I	6	Pass in CHEM1042 General chemistry; and Not for students who have passed in CHEM2041 Principles of chemistry or CHEM2442 Fundamental of organic chemistry or have already enrolled in this course.	Y	Y	1, 2	Dec, May	130	Prof P Chiu, Chemistry	2012 Major in Biochemistry 2012 Major in Chemistry 2013 Major in Biochemistry 2013 Major in Chemistry 2014 Major in Biochemistry 2014 Major in Chemistry	2012 Minor in Chemistry 2013 Minor in Chemistry 2014 Minor in Chemistry
CHEM2442	Fundamentals of organic chemistry	6	Pass in CHEM1042 General chemistry; and Not for students who have passed CHEM2441 Organic chemistry I or have already enrolled in this course.	Y	Y	1	Dec	120	Dr P H Toy, Chemistry		2012 Minor in Chemistry 2013 Minor in Chemistry 2014 Minor in Chemistry
CHEM2443	Fundamentals of organic chemistry for pharmacy students	6	Pass in CHEM1042 General chemistry; 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		

Course Code	Title	Credit	Pre-requisite	Avail	able in		Exam held in 2014-2015		Course Coordinator		ajor / Minor urse appears as a required course)
Domostino out	of Chamistay (Coatle)					0=year long 1=1st sem 2=2nd sem S=summer			TBC = To be confirmed	Compulsory Course (Must Take)	Core Course (With Choices)
•	of Chemistry (Cont'd)		Dans in OUENMOND Comment of a secietary	. V	Y	4.0	Dec Mari	400	D. IVT	2040 Maior in Disabassista	2012 Minor in Chemistry
SHEW2541	Physical chemistry I		Pass in CHEM1042 General chemistry; and Not for students who passed in CHEM2041 Principles of chemistry or have already enrolled in this course.	Y	ĭ	1, 2	Dec, May	100	Dr J Y Tang, Chemistry	2012 Major in Biochemistry 2012 Major in Chemistry 2013 Major in Biochemistry 2013 Major in Chemistry 2014 Major in Biochemistry 2014 Major in Chemistry	2012 Millior in Chemistry 2013 Minor in Chemistry 2014 Minor in Chemistry
CHEM3141	Environmental chemistry		Pass in CHEM2041 Principles of chemistry or CHEM2341 Inorganic chemistry I or CHEM2441 Organic chemistry I or CHEM2442 Fundamentals of organic chemistry or CHEM2541 Physical chemistry I	Y	Y	2	May	100	Dr W T Chan, Chemistry		2012 Major in Environmental Science 2012 Minor in Environmental Science 2013 Major in Environmental Science 2013 Minor in Environmental Science 2014 Major in Environmental Science 2014 Minor in Environmental Science
	Chemical process industries and analysis		Pass in CHEM2041 Principles of chemistry or CHEM2341 Inorganic chemistry I or CHEM2441 Organic chemistry I or CHEM2541 Physical chemistry I	Y	Y	2	May	20	Prof G K Y Chan, Chemistry		
	Introduction to materials chemistry		Pass in CHEM 2341 Inorganic chemistry I or CHEM2441 Organic chemistry I or CHEM2541 Physical chemistry I or CHEM2041 Principles of chemistry or CHEM2442 Fundamentals of organic chemistry	Y	Y	1	Dec	100	Prof W K Chan, Chemistry		
	Principles and applications of spectroscopic and analytical techniques	6	Pass in any CHEM2XXX level course	Y	Y	2	May	110	Dr X Li, Chemistry	2012 Major in Chemistry 2013 Major in Chemistry 2014 Major in Chemistry	
	Analytical chemistry II: chemical instrumentation		Pass in CHEM2041 Principles of chemistry or CHEM2241 Anlytical chemistry I or CHEM3146 Principles and applications of spectroscopic techniques	Y	Y	1	Dec	80	Dr W T Chan, Chemistry	2012 Major in Chemistry 2013 Major in Chemistry 2014 Major in Chemistry	2012 Major in Environmental Science 2012 Minor in Environmental Science 2013 Major in Environmental Science 2013 Minor in Environmental Science 2014 Major in Environmental Science 2014 Minor in Environmental Science
CHEM3242	Food and water analysis		Pass in CHEM2241 Analytical chemistry I or CHEM2341 Inorganic chemistry I or CHEM2441 Organic chemistry I or CHEM2441 Physical chemistry I or CHEM2041 Principles of chemistry; 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		2012 Major in Environmental Science 2012 Minor in Environmental Science 2013 Major in Environmental Science 2013 Minor in Environmental Science 2014 Major in Environmental Science 2014 Minor in Environmental Science
	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	100	Dr X Li, Chemistry		
	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	30	Dr X Li, Chemistry		
CHEM3341	Inorganic chemistry II		Pass in CHEM2341 Inorganic chemistry I	Y	Y	1	Dec	82	Prof V W W Yam, Chemistry	2012 Major in Chemistry 2013 Major in Chemistry 2014 Major in Chemistry	
CHEM3342	Bioinorganic chemistry	6	Pass in CHEM2341 Inorganic chemistry I	Y	Y	2	May	50	Prof H Z Sun, Chemistry		

Course Code	Title	Credit	Pre-requisite	Avail	able in		Exam held in 2014-2015	Quota	Course Coordinator		ajor / Minor urse appears as a required course)
Donartman	t of Chamistry (Cont'd)					0=year long 1=1st sem 2=2nd sem S=summer			TBC = To be confirmed	Compulsory Course (Must Take)	Core Course (With Choices)
	t of Chemistry (Cont'd)					_			·		1
CHEM3441	Organic chemistry II		Pass in CHEM2441 Organic chemistry I; and Pass in CHEM3146 Principles of applications of spectroscopic techniques, or already enrolled in this course.	Y	Y	2	May	90	Prof D Yang, Chemistry	2012 Major in Chemistry 2013 Major in Chemistry 2014 Major in Chemistry	2012 Major in Biochemistry 2013 Major in Biochemistry 2014 Major in Biochemistry
CHEM3442	Organic chemistry of biomolecules		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		
CHEM3541	Physical chemistry II: introduction to quantum chemistry	6	Pass in CHEM2541 Physical chemistry I	Y	Y	1	Dec	80	Prof A S C Cheung, Chemistry	2012 Major in Chemistry 2013 Major in Chemistry 2014 Major in Chemistry	
CHEM3999	Directed studies in chemistry		Pass in at least 24 credits of advanced level compulsory/core chemistry courses (CHEM3XXX or CHEM4XXX) in the Chemistry Major including CHEM2341 Inorganic chemistry I or CHEM2441 Organic chemistry I or CHEM2541 Physical chemistry I or CHEM2442 Fundamentals of organic chemistry or CHEM346 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		
	Symmetry, group theory and applications		Pass in CHEM3341 Inorganic chemistry II	Y	Y	1	Dec	60	Prof V W W Yam, Chemistry		
	Interfacial science and technology		Pass in CHEM3541 Physical chemistry II: introduction to quantum chemistry	Y	Y	2	May	50	Prof G K Y Chan, Chemistry		
CHEM4144	Advanced materials		Pass in CHEM3143 Introduction to materials chemistry	Y	Y	2	May	50	Prof W K Chan, Chemistry		
CHEM4145	Medicinal chemistry		Pass in CHEM3441 Organic chemistry II or CHEM3442 Organic Chemistry of Biomolecules	Y	Y	2	May	140	Prof H Z Sun, Chemistry		2012 Major in Biochemistry 2013 Major in Biochemistry 2014 Major in Biochemistry
CHEM4241	Modern chemical instrumentation and applications	6	Pass in CHEM3241 Analytical chemistry II: chemical instrumentation	Y	Y	1	Dec	50	Dr I K Chu, Chemistry		
CHEM4242	Analytical chemistry		Pass in CHEM3241 Analytical chemistry II: chemical instrumentation or CHEM3242 Food and water analysis	Y	Y	2	May	50	Dr K M Ng, Chemistry		
CHEM4341	Advanced inorganic chemistry		Pass in CHEM3341 Inorganic chemistry II (Students are strongly recommended to take CHEM4142 Symmetry, group theory and applications if they wish to take this course.)	Y	Y	1	Dec	60	Prof C M Che, Chemistry		2012 Major in Chemistry 2013 Major in Chemistry 2014 Major in Chemistry
CHEM4342	Organometallic chemistry		Pass in CHEM3341 Inorganic chemistry II	Y	Y	1	Dec	40	Prof V W W Yam, Chemistry		
	Advanced organic chemistry		Pass in CHEM3441 Organic chemistry II	Y	Y	1	Dec	80	Prof D Yang, Chemistry		2012 Major in Chemistry 2013 Major in Chemistry 2014 Major in Chemistry
CHEM4443	Integrated organic synthesis	6	Pass in CHEM3441 Organic chemistry II	Y	Y	2	May	50	Prof P Chiu, Chemistry		2012 Major in Chemistry 2013 Major in Chemistry 2014 Major in Chemistry

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						0=year long 1=1st sem 2=2nd sem S=summer			TBC = To be confirmed	Compulsory Course (Must Take)	Core Course (With Choices)
Department	of Chemistry (Cont'd)										
	Chemical biology		Pass in CHEM3441 Organic chemistry II or BIOC3601 Metabolism		Y	2	Мау		Dr X C Li, Chemistry		2012 Major in Biochemistry 2012 Minor in Biochemistry 2013 Major in Biochemistry 2013 Minor in Biochemistry 2014 Major in Biochemistry 2014 Minor in Biochemistry
	Physical chemistry III: statistical thermodynamics and kinetic theory	6	Pass in CHEM3541 Physical chemistry II: introduction to quantum chemistry	Y	Y	2	May	40	Dr H Hu, Chemistry		2012 Major in Chemistry 2013 Major in Chemistry 2014 Major in Chemistry
	Computational chemistry	6	Pass in CHEM3541 Physical chemistry II: introduction to quantum chemistry or PHYS3351 Quantum mechanics.	Y	N	2	May	60	Prof G H Chen, Chemistry		
CHEM4543	Advanced physical	6	Pass in CHEM3541 Physical chemistry	Y	Υ	2	May	80	Prof G H Chen,		
CUENAGAS	Chemistry		II: introduction to quantum chemistry	.,	Y		No com		Chemistry		
CHEM4910	Chemistry literacy and research	6	Pass in at least 24 credits of advanced level compulsory/core chemistry courses (CHEM3XXX or CHEM4XXX) in the Chemistry Major including CHEM3241 Analytical chemistry II: chemical instrumentation; and CHEM3341 Inorganic chemistry II; and CHEM3410 Organic chemistry II; and CHEM3541 Physical chemistry II: introduction to quantum chemistry. This capstone course is for Chemistry Major students only.	Y	Y	2	No exam		Dr X Li, Chemistry		
CHEM4911	Capstone experience for chemistry undergraduates: HKUtopia	6	Students are expected to have satisfactorily completed all introductory chemistry core courses and at least 24 credits of advanced level compulsory/core chemistry courses in the Chemistry Major. Students who are interested in taking the course should contact the Department for application.  This capstone course is for Chemistry Major students only.	Y	Y	S	No exam		Dr A P L Tong, Chemistry		
CHEM4966	Chemistry internship	6	Pass in at least 24 credits of advanced level compulsory/core chemistry courses (CHEM3XXX or CHEM4XXX) in the Chemistry Major. Students are expected to have satisfactorily completed their Year 3 study. This capstone course is for Chemistry Major students only.	Y	Y	2, S	No exam		Dr W T Chan, Chemistry		
CHEM4999	Chemistry project	12	Pass in at least 24 credits of advanced level compulsory/core chemistry courses (CHEM3XXX or CHEM4XXX) in the Chemistry Major including CHEM3241 Analytical chemistry II: chemistry instrumentation, and CHEM3341 Inorganic chemistry II, and CHEM3410 Organic chemistry II, and CHEM3541 Physical chemistry II: introduction to quantum chemistry. This capstone course is for Chemistry Major students only.	N	Y				Dr J Y Tang, Chemistry		

Course Code	Title	Credit	Pre-requisite	Avail	able in	Semester offered in 2014-2015	Exam held in 2014-2015		Course Coordinator		ajor / Minor urse appears as a required course)
Denartment	of Chemistry (Cont'd)					0=year long 1=1st sem 2=2nd sem S=summer			TBC = To be confirmed	Compulsory Course (Must Take)	Core Course (With Choices)
ENVS3042	* * * * * * * * * * * * * * * * * * * *	6	Pass in ENVS1401 Introduction to environmental science or BIOL1110 From molecules to cells or ENVS1301 Environmental life science; and CHEM2041 Principles of chemistry or ENVS2001 Environmental field and lab course or ENVS2002 Environmental data analysis	Y	Y	2	May	60	Dr W T Chan, Chemistry		2012 Major in Environmental Science 2012 Minor in Environmental Science 2013 Major in Environmental Science 2013 Minor in Environmental Science 2014 Major in Environmental Science 2014 Minor in Environmental Science
School of C											
	Practical Chinese for science students	6	NIL	Y	Y	1, 2	Dec, May		Mr K W Wong, Chinese		
•	of Earth Sciences										
	Introduction to climate science		NIL	Y	Y	2	May		Dr Z H Liu, Earth Sciences		2012 Major in Environmental Science 2013 Major in Environmental Science 2013 Minor in Environmental Science 2014 Major in Environmental Science 2014 Minor in Environmental Science
EASC1401	Blue planet	6	NIL	Y	Y	1, 2	Dec, May		Dr P Bach, Earth Sciences	2012 Major in Earth System Science 2013 Major in Earth System Science 2014 Major in Earth System Science	2012 Major in Environmental Science 2012 Minor in Earth Sciences 2012 Minor in Environmental Science 2013 Major in Environmental Science 2013 Minor in Earth Sciences 2013 Minor in Environmental Science 2014 Major in Environmental Science 2014 Minor in Earth Sciences 2014 Minor in Earth Sciences
EASC1402	Principles of geology	6	NIL	Y	Y	1	Dec		Prof Min Sun, Earth Sciences	2012 Major in Earth System Science 2012 Major in Geology 2013 Major in Earth System Science 2013 Major in Geology 2014 Major in Earth System Science 2014 Major in Geology	2012 Minor in Earth Sciences 2013 Minor in Earth Sciences 2014 Minor in Earth Sciences
EASC1403	Geological heritage of Hong Kong	6	NIL	Y	Y	2	May	35	Dr P Y Tam, 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		
	Fluid/solid interactions in earth processes	6	Pass in EASC1401 Blue planet or EASC1402 Principles of geology	Y	Y	2	May		Dr K Lemke, Earth Sciences	2012 Major in Earth System Science 2012 Major in Geology 2013 Major in Earth System Science 2013 Major in Geology 2014 Major in Earth System Science 2014 Major in Geology	2012 Minor in Earth Sciences 2013 Minor in Earth Sciences 2014 Minor in Earth Sciences
EASC2402	Field methods	6	Pass in EASC1401 Blue planet or EASC1402 Principles of geology	Y	Y	1	Dec		Dr P Bach, Earth Sciences	2012 Major in Earth System Science 2012 Major in Geology 2013 Major in Earth System Science 2013 Major in Geology 2014 Major in Earth System Science 2014 Major in Geology	
	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	2012 Major in Earth System Science 2013 Major in Earth System Science 2014 Major in Earth System Science	2012 Major in Environmental Science 2012 Minor in Environmental Science 2013 Minor in Environmental Science 2014 Minor in Environmental Science
EASC2406	Geochemistry	6	Pass in EASC1402 Principles of geology	Y	Y	1	Dec		Dr S H Li, Earth Sciences	2012 Major in Geology 2013 Major in Geology 2014 Major in Geology	

Course Code	Title	Credit	Pre-requisite	Availa	able in	Semester offered in 2014-2015	Exam held in 2014-2015		Course Coordinator	(The Major/Minor that this	Major / Minor course appears as a required course)
	A Fact Original (Out of					0=year long 1=1st sem 2=2nd sem S=summer			TBC = To be confirmed	Compulsory Course (Must Take)	Core Course (With Choices)
•	t of Earth Sciences (Cont'd)						_				
:ASC2407	Mineralogy	6	Pass in EASC1402 Principles of geology	Y	Y	1	Dec	30	Prof M Sun, Earth Sciences	2012 Major in Geology 2013 Major in Geology 2014 Major in Geology	
ASC2408	Planetary geology		Pass in EASC1401 Blue planet or EASC1402 Principles of geology or PHYS1650 Nature of the universe	Y	Y	2	May		Dr M H Lee, Earth Sciences	2012 Major in Astronomy 2013 Major in Astronomy 2014 Major in Astronomy	
ASC2409	Regional field studies	6	Pass in EASC1401 Blue Planet or EASC1402 Principles of Geology and consent of course coordinator	Y	Y	1	No exam	25	Dr J Ali, Earth Sciences	2014 Wajor III Associotity	
EASC3020	Global change: anthropogenic impacts		Pass in EASC2404 Introduction to atmosphere and hydrosphere or ENVS2001 Environmental field and lab course	Y	N	1	Dec		Dr Z H Liu, Earth Sciences		2012 Major in Environmental Science 2012 Minor in Environmental Science 2013 Major in Environmental Science 2013 Minor in Environmental Science 2014 Major in Environmental Science 2014 Minor in Environmental Science
ASC3402	Petrology	6	Pass in EASC2407 Mineralogy	Y	Y	2	May		Prof G Zhao, Earth Sciences	2012 Major in Geology 2013 Major in Geology 2014 Major in Geology	
ASC3403	Sedimentary environments		Pass in EASC2402 Field methods or EASC3402 Petrology	Y	Y	2	May		Dr S C Chang, Earth Sciences	2012 Major in Geology 2013 Major in Geology 2014 Major in Geology	2012 Major in Earth System Science 2013 Major in Earth System Science 2014 Major in Earth System Science
ASC3404	Structural geology	6	Pass in EASC2402 Field methods and EASC3402 Petrology	Y	Y	1	Dec	40	Dr J R Ali, Earth Sciences	2012 Major in Geology 2013 Major in Geology 2014 Major in Geology	·
EASC3405	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	Prof Y Zong, Earth Sciences		2012 Major in Earth System Science 2012 Major in Environmental Science 2012 Minor in Environmental Science 2013 Major in Earth System Science 2013 Major in Environmental Science 2013 Minor in Environmental Science 2014 Major in Earth System Science 2014 Major in Environmental Science 2014 Minor in Environmental Science
ASC3406	Reconstruction of past climate		Pass in EASC2401 Fluid/solid interactions in earth processes	N	Y				Dr S H Li, Earth Sciences		2012 Major in Earth System Science 2012 Major in Geology 2013 Major in Earth System Science 2013 Major in Geology 2014 Major in Earth System Science 2014 Major in Geology
ASC3408	Geophysics		Pass in EASC2401 Fluid/solid interactions in earth processes or EASC2402 Field methods or PHYS2250 Introductory mechanics	Y	Y	2	May		Prof P Wu, Earth Sciences	2012 Major in Geology 2013 Major in Geology 2014 Major in Geology	2012 Major in Earth System Science 2013 Major in Earth System Science 2014 Major in Earth System Science
ASC3409	Igneous and metamorphic petrogenesis	6	Pass in EASC3402 Petrology	Y	Y	2	May	30	Prof M Sun, Earth Sciences	2012 Major in Geology 2013 Major in Geology 2014 Major in Geology	
ASC3410	Hydrogeology		Pass in EASC2402 Field methods	Y	Y	1	Dec	40	Prof J J Jiao, Earth Sciences		2012 Major in Earth System Science 2012 Major in Geology 2013 Major in Earth System Science 2013 Major in Geology 2014 Major in Earth System Science 2014 Major in Geology
EASC3412	Earth resources		Pass in EASC2402 Field methods or EASC3402 Petrology	Y	Y	1	Dec	40	Prof M F Zhou, Earth Sciences		2012 Major in Earth System Science 2012 Major in Geology 2013 Major in Earth System Science 2013 Major in Geology 2014 Major in Earth System Science 2014 Major in Geology

Course Code	Title	Credit	t Pre-requisite	Available in			Exam held in 2014-2015		Course Coordinator	Major / Minor (The Major/Minor that this course appears as a required course)	
						0=year long 1=1st sem 2=2nd sem S=summer			TBC = To be confirmed	Compulsory Course (Must Take)	Core Course (With Choices)
Departmen	t of Earth Sciences (Cont'd)										
EASC3413	Engineering geology	6	Pass in EASC3410 Hydrogeology, or already enrolled in this course	Y	Y	2	May	40	Prof J J Jiao, Earth Sciences		2012 Major in Geology 2013 Major in Geology 2014 Major in Geology
EASC3414	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		2012 Major in Geology 2013 Major in Geology 2014 Major in Geology
EASC3415	Meteorology	6	Pass in EASC2404 Introduction to atmosphere and hydrosphere	Y	Y	1	Dec		Dr Z H Liu, Earth Sciences		2012 Major in Earth System Science 2013 Major in Earth System Science 2014 Major in Earth System Science
EASC3416	Advanced geochemistry and geochronology	6	Pass in EASC2401 Fluid/solid interactions in earth processes or EASC2406 Geochemistry or EASC2407 Mineralogy	Y	N	2	May	50	Prof M F Zhou, Earth Sciences		2012 Major in Earth System Science 2012 Major in Geology 2013 Major in Earth System Science 2013 Major in Geology 2014 Major in Earth System Science 2014 Major in Geology
EASC3999	Directed studies in earth sciences	6	Pass in at least 24 credits of advanced level earth sciences courses (EASC3XXX or EASC4XXX); and Cumulative GPA of 2.5 or above.	Y	Y	0	No exam		Prof M Sun, Earth Sciences		2012 Major in Earth System Science 2012 Major in Geology 2013 Major in Earth System Science 2013 Major in Geology 2014 Major in Earth System Science 2014 Major in Geology
EASC4403	Biogeochemical cycles	6	Pass in ENVS3313 Environmental oceanography or EASC3403 Sedimentary environments or EASC3416 Advanced geochemistry and geochronology	N	Y				Dr Y Li, Earth Sciences	2012 Major in Earth System Science 2013 Major in Earth System Science 2014 Major in Earth System Science	2012 Major in Geology 2013 Major in Geology 2014 Major in Geology
EASC4406	Earth dynamics	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	2012 Major in Geology 2013 Major in Geology 2014 Major in Geology	
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		2012 Major in Geology 2013 Major in Geology 2014 Major in Geology
EASC4408	Special topics in earth sciences	6	Pass in any EASC3XXX or EASC4XXX course	N	Y				TBC, Earth Sciences		2012 Major in Earth System Science 2012 Major in Geology 2013 Major in Earth System Science 2013 Major in Geology 2014 Major in Earth System Science 2014 Major in Geology
EASC4911	Earth system: contemporary issues	6	Pass in at least 24 credits of advanced level compulsory/core earth sciences courses (EASC3XXX or EASC4XXX) in the Earth System Science Major including at least two of the following courses: EASC3410 Hydrogeology or EASC3415 Meteorology or ENVS3313 Environmental oceanography. This capstone course is for Earth System Science Major students only.	N	Y				TBC, Earth Sciences		

Course	Title	Credit	Pre-requisite	Available in		Semester	Exam held	 Course Coordinator	Major / Minor		
Code						offered in 2014-2015	in 2014-2015		(The Major/Minor that this course appears as a required course)		
						0=year long 1=1st sem 2=2nd sem S=summer		TBC = To be confirmed	Compulsory Course (Must Take)	Core Course (With Choices)	
	t of Earth Sciences (Cont'd)	)									
EASC4955	Integrated field studies		Pass in at least 24 credits of advanced level compulsory/core earth sciences courses (EASC3XXX or EASC4XXX) in the Geology Major including EASC3403 Sedimentary environments, EASC3404 Structural geology, EASC3409 Igneous and metamorphic petrogenesis This capstone course is for Geology Major students only.	Y	Y	2	No exam	 Dr J King, Earth Sciences			
EASC4966	Earth sciences internship		Pass in at least 24 credits of advanced level earth sciences courses (EASC3XXX or EASC4XXX). Students are expected to have satisfactorily completed their Year 3 study. 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 P Y Tam, Earth Sciences			
EASC4999	Earth sciences project	12	Pass in at least 24 credits of advanced level earth sciences courses (EASC3XXX or EASC4XXX); and Cumulative GPA of 2.7 or above.	N	Y			 Prof M Sun, Earth Sciences		2012 Major in Earth System Science 2012 Major in Geology 2013 Major in Earth System Science 2013 Major in Geology 2014 Major in Earth System Science 2014 Major in Geology	
ENVS1401	Introduction to environmental science	6	NIL	Y	Y	1	Dec	 Dr C Dingle, Earth Sciences	2012 Major in Environmental Science 2012 Minor in Environmental Science 2013 Major in Environmental Science 2013 Minor in Environmental Science 2014 Major in Environmental Science 2014 Minor in Environmental Science		
ENV\$3004	Environment, society and economics	6	Pass in CHEM2041 Principles of chemistry or EASC2404 Introduction to atmosphere and hydrosphere or ENVS2001 Environmental field and lab course or ENVS2002 Environmental data analysis	Y	Y	2	May	 Prof Y Q Zong, Earth Sciences	2012 Major in Environmental Science 2012 Minor in Environmental Science 2013 Major in Environmental Science 2013 Minor in Environmental Science 2014 Major in Environmental Science 2014 Minor in Environmental Science		
ENV\$3007	Natural hazards and mitigation	6	Pass in EASC2401 Fluid/solid interactions in earth processes or ENVS2001 Environmental field and lab course or ENVS2002 Environmental data analysis	Y	N	1	Dec	 Prof Y Q Zong, Earth Sciences		2012 Major in Earth System Science 2012 Major in Environmental Science 2012 Major in Geology 2012 Minor in Environmental Science 2013 Major in Earth System Science 2013 Major in Environmental Science 2013 Major in Geology 2013 Minor in Environmental Science 2014 Major in Earth System Science 2014 Major in Environmental Science 2014 Major in Geology 2014 Minor in Geology 2014 Minor in Environmental Science	

Course Code	Title	Credit	Pre-requisite	Availa	able in		Exam held in 2014-2015		Course Coordinator		or / Minor se appears as a required course)
<b>Donartmont</b>	t of Earth Sciences (Cont'd)					0=year long 1=1st sem 2=2nd sem S=summer			TBC = To be confirmed	Compulsory Course (Must Take)	Core Course (With Choices)
ENVS3313	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 S C Chang, Earth Sciences	2012 Minor in Marine Biology 2013 Minor in Marine Biology 2014 Minor in Marine Biology	2012 Major in Earth System Science 2012 Major in Environmental Science 2012 Minor in Environmental Science 2013 Major in Earth System Science 2013 Major in Environmental Science 2013 Minor in Environmental Science 2014 Major in Earth System Science 2014 Major in Environmental Science 2014 Minor in Environmental Science 2014 Minor in Environmental Science
ENVS3999	Directed studies in environmental science	6	Pass in at least 24 credits of advanced level (level 3 or 4) compulsory/core courses in Environmental Science Major. Cumulative GPA of 2.5 or above in Environmental Science Major. This capstone course is for Environmental Science Major students only.	N	Y				Dr C Dingle, Earth Sciences		
	Environmental science project	12	Pass in at least 24 credits of advanced level (level 3 or 4) compulsory/core courses in Environmental Science Major; and Students must have a cumulative GPA of 3.0 or above in Environmental Science Major. This capstone course is for Environmental Science Major students only.	N	Y				Prof Y Q Zong, Earth Sciences		
Department	of Mathematics		joiny.						!		
MATH1011	University mathematics I	6	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 K H Law, Mathematics		
	University mathematics II		Level 2 or above in Module 1, or Module 2 of HKDSE Mathematics or equivalent. Students who do not fulfill this requirement are advised to take 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		Dr Y M Chan (1st sem); Prof J H Lu (2nd sem), Mathematics	2012 Major in Mathematics 2012 Major in Mathematics/Physics 2012 Major in Risk Management 2012 Major in Statistics 2012 Minor in Computational & Financial Mathematics 2013 Minor in Mathematics 2013 Major in Mathematics 2013 Major in Risk Management 2013 Major in Statistics 2013 Major in Statistics 2013 Minor in Computational & Financial Mathematics 2013 Minor in Mathematics 2014 Major in Mathematics 2014 Major in Mathematics 2014 Major in Statistics 2014 Minor in Computational & Financial Mathematics 2014 Minor in Computational & Financial Mathematics 2014 Minor in Computational & Financial Mathematics 2014 Minor in Mathematics	2012 Minor in Actuarial Studies 2013 Minor in Actuarial Studies 2014 Minor in Actuarial Studies
	Mathematical laboratory and modeling	6	NIL	N	Y			20	TBC, Mathematics	25.1 mile. in Marionalios	

Course Code	Title	Credit	Pre-requisite	Avail	able in	Semester offered in 2014-2015	Exam held in 2014-2015		Course Coordinator		or / Minor se appears as a required course)
<b>D</b>	- (Mathematica (Ocalis)					0=year long 1=1st sem 2=2nd sem S=summer			TBC = To be confirmed	Compulsory Course (Must Take)	Core Course (With Choices)
MATH1821	of Mathematics (Cont'd)  Mathematical methods for actuarial science I	6	Level 4 or above in HKDSE Mathematics plus Module 1, or Level 4 or above in HKDSE Mathematics plus Module 2, or equivalent; and Not for students who have passed MATH1013 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 C W Wong, Mathematics	2012 BSc in Actuarial Science 2013 BSc in Actuarial Science 2014 BSc in Actuarial Science	
	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	560	Prof K M Tsang (1st sem); Dr Y K Lau (2nd sem), Mathematics		
	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	560	Prof W K Ching (1st sem); Dr G Han (2nd sem), Mathematics		
MATH2012	Fundamental concepts of mathematics	6	Pass in MATH1013 University mathematics II 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	2012 Major in Mathematics 2013 Major in Mathematics 2014 Major in Mathematics	
	Multivariable calculus and linear algebra	6	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 II) and MATH2211 Multivariable calculus), or have already enrolled in these courses.	Y	Y	2	May		Dr J T Chan, Mathematics	2014 Major in Risk Management 2014 Major in Statistics	
MATH2101	Linear algebra I	6	Pass in MATH1013 University mathematics II 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	2012 Major in Mathematics 2012 Major in Mathematics/Physics 2012 Minor in Computational & Financial Mathematics 2013 Minor in Mathematics 2013 Major in Mathematics 2013 Major in Mathematics/Physics 2013 Minor in Computational & Financial Mathematics 2014 Major in Mathematics 2014 Major in Mathematics 2014 Major in Mathematics/Physics 2014 Minor in Computational & Financial Mathematics 2014 Minor in Computational & Financial Mathematics 2014 Minor in Mathematics	
MATH2102	Linear algebra II	6	Pass in MATH2101 Linear algebra I or MATH2822 Mathematical methods for actuarial science II	Y	Y	1, 2	Dec, May		Dr Y K Lau (1st sem); Dr Z Hua (2nd sem), Mathematics	2012 Major in Mathematics 2013 Major in Mathematics 2014 Major in Mathematics	

Course Code	Title (	Credit	Pre-requisite	Availa	able in	Semester offered in 2014-2015	Exam held in 2014-2015		Course Coordinator	Major (The Major/Minor that this course	r / Minor e appears as a required course)
Denartment	of Mathematics (Cont'd)					0=year long 1=1st sem 2=2nd sem S=summer			TBC = To be confirmed	Compulsory Course (Must Take)	Core Course (With Choices)
	Multivariable calculus	6	Pass in MATH1013 University mathematics II 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 S P Yung (2nd sem), Mathematics	2012 Major in Mathematics 2012 Major in Mathematics/Physics 2012 Minor in Computational & Financial Mathematics 2012 Minor in Mathematics 2013 Major in Mathematics 2013 Major in Mathematics/Physics 2013 Minor in Computational & Financial Mathematics 2013 Minor in Mathematics 2014 Major in Mathematics 2014 Major in Mathematics/Physics 2014 Minor in Computational & Financial Mathematics 2014 Minor in Computational & Financial Mathematics 2014 Minor in Mathematics	
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	Y	Y	1, 2	Dec, May		Dr B Kane (1st sem); Dr Y M Chan (2nd sem), Mathematics	2012 Major in Mathematics 2013 Major in Mathematics 2014 Major in Mathematics	
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	2012 BSc in Actuarial Science 2013 BSc in Actuarial Science 2014 BSc in Actuarial Science	
MATH3001	Development of mathematical ideas	6	Pass in MATH2101 Linear algebra I, MATH2102 Linear algebra II, MATH2211 Multivariable calculus and MATH2241 Introduction to mathematical	N	N				Prof W K Ching, Mathematics		
MATH3002	Mathematics seminar	6	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.)	Y	Y	2	May	12	Dr T W Ng, Mathematics		
MATH3301	Algebra I	6	Pass in MATH2101 Linear algebra I	Y	Y	1	Dec		Prof J H Lu, Mathematics	2012 Major in Mathematics 2012 Major in Mathematics/Physics 2013 Major in Mathematics 2013 Major in Mathematics/Physics 2014 Major in Mathematics 2014 Major in Mathematics/Physics	
MATH3303	Matrix theory and its	6	Pass in MATH2101 Linear algebra I and	Υ	Y	1	Dec		Dr M Young, Mathematics		
MATH3304	applications Introduction to number theory	6	MATH2102 Linear algebra II Pass in MATH2101 Linear algebra I, MATH2102 Linear algebra II, MATH2211 Multivariable calculus and MATH2241 Introduction to mathematical analysis; and Pass in MATH3301 Algebra I, or already enrolled in this course.	Y	Y	2	May		Mathematics Prof K M Tsang, Mathematics		
MATH3401	,		Pass in MATH2211 Multivariable calculus	Y	Y	1	Dec		Prof W S Cheung, Mathematics	2012 Major in Mathematics 2012 Major in Mathematics/Physics 2013 Major in Mathematics 2013 Major in Mathematics/Physics 2014 Major in Mathematics 2014 Major in Mathematics	
MATH3403	Functions of a complex variable	6	Pass in MATH2211 Multivariable calculus and MATH2241 Introduction to mathematical analysis	Y	Y	1	Dec		Prof N Mok, Mathematics	2012 Major in Mathematics 2013 Major in Mathematics 2014 Major in Mathematics	

Course Code	Title	Credit	Pre-requisite	Avail	able in	Semester offered in 2014-2015	Exam held in 2014-2015	 Course Coordinator		or / Minor se appears as a required course)
Donortmont	of Mathematics (Cont'd)					0=year long 1=1st sem 2=2nd sem S=summer		TBC = To be confirmed	Compulsory Course (Must Take)	Core Course (With Choices)
	Differential equations		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 C W Wong, Mathematics		
	Computational methods and differential equations with applications		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 C W Wong, Mathematics		2012 Major in Environmental Science 2012 Minor in Computational & Financial Mathematics 2013 Major in Environmental Science 2013 Minor in Computational & Financial Mathematics 2014 Major in Environmental Science 2014 Minor in Computational & Financial Mathematics
MATH3600	Discrete mathematics		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 (MATH1821 Mathematical methods for actuarial science I and MATH2822 Mathematical methods for actuarial science II)	Υ	Y	1	Dec	 Prof W Zang, Mathematics		
MATH3601	Numerical analysis	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	1	Dec	 Dr M Y Yim, Mathematics	2012 Minor in Computational & Financial Mathematics 2013 Minor in Computational & Financial Mathematics 2014 Minor in Computational & Financial Mathematics	
MATH3603	Probability theory		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	1	Dec	 Dr G Han, Mathematics		2012 Minor in Computational & Financial Mathematics 2013 Minor in Computational & Financial Mathematics 2014 Minor in Computational & Financial Mathematics
MATH3901	Operations research I		Pass in MATH2101 Linear algebra I or MATH2102 Linear algebra II	Y	Y	1	Dec	 Prof S C K Chu, Mathematics		
MATH3904	Introduction to optimization		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	 Prof W Zang, Mathematics		2012 Minor in Computational & Financial Mathematics 2013 Minor in Computational & Financial Mathematics 2014 Minor in Computational & Financial Mathematics
MATH3905	Queueing theory and simulation		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)	N	Y			 Prof W K Ching, Mathematics		
MATH3906	Financial calculus		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) or STAT2601 Probability and statistics I	Y	Y	1	Dec	 Dr C W Wong, Mathematics	2012 Minor in Computational & Financial Mathematics 2013 Minor in Computational & Financial Mathematics 2014 Minor in Computational & Financial Mathematics	

Course Code	Title	Credit	t Pre-requisite	Availa	able in	Semester offered in 2014-2015	Exam held in 2014-2015	Course Coordinator	(The Major/Minor that this	Major / Minor course appears as a required course)
Department	of Mathematics (Cont'd)					0=year long 1=1st sem 2=2nd sem S=summer		TBC = To be confirmed	Compulsory Course (Must Take)	Core Course (With Choices)
-	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	Мау	 Dr K H Law, Mathematics		2012 Minor in Computational & Financial Mathematics 2013 Minor in Computational & Financial Mathematics 2014 Minor in Computational & Financial Mathematics
MATH3943	Network models in operations research	6	Pass in MATH2101 Linear algebra I and MATH2211 Multivariable calculus; and Pass in MATH3901 Operations research I, or already enrolled in this course	Y	Y	2	May	 Prof W Zang, Mathematics		
MATH3999	Directed studies in mathematics	6	Pass in at least 24 credits of advanced level compulsory/core mathematics courses (MATH3XXX, MATH4XXX or MATH6XXX) 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.  This capstone course is for Mathematics, and Mathematics, and Mathematics/Physics Majors students only.	Y	Y	2	No exam	 Prof W K Ching, Mathematics		
MATH4302	Algebra II	6	Pass in MATH3301 Algebra I	Y	Y	2	May	 Prof J T Yu, Mathematics		
MATH4402	Analysis II	6	Pass in MATH3401 Analysis I	Y	Y	2	May	 Dr F Ye,		
MATH4404	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	 Mathematics Dr C W Wong, Mathematics		
MATH4406	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	1	Dec	 Dr S Wu, Mathematics		
MATH4501	Geometry	6	Pass in MATH2101 Linear algebra I and MATH3401 Analysis I	Y	Y	1	Dec	 Dr J Fullwood, Mathematics	2012 Major in Mathematics/Physics 2013 Major in Mathematics/Physics 2014 Major in Mathematics/Physics	
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)	N	Y			 Prof W K Ching, Mathematics		
MATH4602	Scientific computing	6	Pass in MATH3601 Numerical analysis	N	Y			 Prof W K Ching, Mathematics		2012 Minor in Computational & Financial Mathematics 2013 Minor in Computational & Financial Mathematics 2014 Minor in Computational & Financial Mathematics
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	N			 Dr G Han, Mathematics		

Course Code	Title	Credit	Pre-requisite	Avail	able in		Exam held in 2014-2015		Course Coordinator		or / Minor se appears as a required course)
						0=year long 1=1st sem 2=2nd sem S=summer			TBC = To be confirmed	Compulsory Course (Must Take)	Core Course (With Choices)
•	of Mathematics (Cont'd)										
MATH4907	Numerical methods for financial calculus		Pass in MATH3906 Financial calculus or equivalent	Y	N	2	May		Dr S P Yung, Mathematics		2012 Minor in Computational & Financial Mathematics 2013 Minor in Computational & Financial Mathematics 2014 Minor in Computational & Financial Mathematics
MATH4910	Senior Mathematics seminar		Pass in at least 24 credits of advanced level compulsory/core mathematics courses (MATH3XXX, MATH4XXX, or MATH6XXX) in the Mathematics, and Mathematics/Physics Majors including MATH3301 Algebra I, MATH3401 Analysis I, MATH3403 Functions of a complex variable.  Subject to approval by the Department. (This course is for third and fourth year students only.)  This capstone course is for Mathematics, and Mathematics/Physics Majors students only.	N	Y			12	TBC, Mathematics		
MATH4911	Mathematics capstone project	6	Pass in at least 24 credits of advanced level compulsory/core mathematics courses (MATH3XXX, MATH4XXX, or MATH6XXX) in the Mathematics, and Mathematics/Physics Majors.  Subject to approval by the Department. (This course is for third and fourth year students only.)  This capstone course is for Mathematics, and Mathematics, and Mathematics/Physics Majors students only.	N	Y				TBC, Mathematics		
MATH4966	Mathematics internship	6	Pass in at least 24 credits of advanced level compulsory/core mathematics courses (MATH3XXX, MATH4XXX, or MATH6XXX) in the Mathematics, and Mathematics/Physics Majors. Students are expected to have satisfactorily completed their Year 3 study. This capstone course is for Mathematics, and Mathematics/Physics Majors students only.	Y	Y	2, S	No exam		Dr T W Ng, Mathematics		
MATH4999	Mathematics project	12	Pass in at least 24 credits of advanced level compulsory/core mathematics courses (MATH3XXX, MATH4XXX, or MATH6XXX) in the Mathematics, and Mathematics/Physics Majors including MATH3301 Algebra I and MATH3401 Analysis I.  This capstone course is for Mathematics, and Mathematics/Physics Majors students only.	N	Y				Prof W K Ching, Mathematics		
	Intermediate complex analysis	6	A first course in Complex Analysis such as MATH3403 Functions of a Complex Variable, and approval by the instructor.	Y	Y	1	Dec		Prof N Mok, Mathematics		
MATH6201	Topics in geometry		(MATH4402 Analysis II or MATH4501 Geometry) and (MATH4511 Introduction to Differentiable Manifolds or the approval of the instructor)	N	N				Dr S Wu, Mathematics		

Course Code	Title	Credit	: Pre-requisite	Avail	able in		Exam held in 2014-2015	Course Coordinator	Major / (The Major/Minor that this course	/ Minor appears as a required course)
						0=year long 1=1st sem 2=2nd sem S=summer		TBC = To be confirmed	Compulsory Course (Must Take)	Core Course (With Choices)
-	of Mathematics (Cont'd)	_								
MATH6202	Complex manifolds	6	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 instructor.	N	Y			 Prof N Mok, Mathematics		
MATH6217	Topics in financial mathematics	6	Pass in an advanced level mathematics courses (MATH3XXX, MATH4XXX, or MATH6XXX) and subject to the approval of the course coordinator.	Y	Y	1	Dec	 Dr J Song, Mathematics		
MATH6219	Topics in applied functional analysis	6	Pass in MATH3401 Analysis I and MATH4404 Functional Analysis, or approval of the course teacher.	N	N			 Dr S P Yung, Mathematics		
	Topics in algebra		Pass in MATH4302 Algebra II	Y	Y	2	May	 Prof J T Yu, Mathematics		
	Topics in applied discrete mathematics		Pass in MATH3301 Algebra I and MATH3600 Discrete mathematics	N	N			 Prof W Zang, Mathematics		
	Topics in mathematical programming and optimization	6	Pass in MATH3901 Operations research I, MATH3904 Introduction to optimization and MATH4902 Operations research II		Y			 Prof W Zang, Mathematics		
MATH6504	Geometric topology	6	Pass in MATH3301 Algebra I and MATH3401 Analysis I	N	Y			 Dr Z Hua, Mathematics		
MATH6505	Real analysis	6	Pass in MATH3401 Analysis I	Y	Y	2	May	 Prof W S Cheung, Mathematics		
	Intermediate complex analysis	6	A first course in Complex Analysis such as MATH3403 Functions of a Complex Variable, and approval by the instructor.	Y	Y	1	Dec	 Prof N Mok, Mathematics		
MATH7505	Real analysis	6	Pass in MATH3401 Analysis I	Y	Y	2	May	 Prof W S Cheung, Mathematics		
Department	of Physics		<u>'</u>						<u>'</u>	
	Physics for engineering students		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		
	Weather and climate		NIL	N	Y			Dr K M Lee, Physics		
	Kitchen science		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 K M Lee, Physics	2012 Major in Physics 2013 Major in Physics 2014 Major in Physics	
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 J C S Pun, Physics		

Course Code	Title	Credit	Pre-requisite	Availa	able in		Exam held in 2014-2015	Course Coordinator	Majo (The Major/Minor that this cours	r / Minor e appears as a required course)
Denartment	of Physics (Cont'd)					0=year long 1=1st sem 2=2nd sem S=summer		TBC = To be confirmed	Compulsory Course (Must Take)	Core Course (With Choices)
	Fundamental physics		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	2012 Major in Astronomy 2012 Major in Mathematics/physics 2012 Minor in Physics 2012 Minor in Astronomy 2013 Minor in Astronomy 2013 Major in Astronomy 2013 Major in Mathematics/Physics 2013 Major in Physics 2013 Minor in Astronomy 2013 Minor in Physics 2014 Major in Astronomy 2014 Major in Mathematics/Physics 2014 Major in Mathematics/Physics 2014 Major in Mathematics/Physics 2014 Minor in Mathematics/Physics 2014 Minor in Astronomy 2014 Minor in Astronomy	
PHYS1650	Nature of the universe	6	NIL	Y	Y	1, 2	Dec, May	 Dr K M Lee, Physics	2012 Major in Astronomy 2012 Minor in Astronomy 2013 Major in Astronomy 2013 Minor in Astronomy 2014 Major in Astronomy 2014 Minor in Astronomy	
PHYS2055	Introduction to relativity		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		
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	2012 Major in Astronomy 2012 Major in Mathematics/Physics 2012 Major in Physics 2013 Major in Physics 2013 Major in Astronomy 2013 Major in Mathematics/Physics 2013 Major in Physics 2013 Major in Physics 2014 Major in Astronomy 2014 Major in Mathematics/Physics 2014 Major in Mathematics/Physics 2014 Major in Mathematics/Physics 2014 Major in Physics 2014 Minor in Physics	
PHYS2255	Introductory electricity and magnetism		Pass in PHYS1250 Fundamental physics or PHYS1050 Physics for engineering students	Y	Y	2	May	 Dr J C S Pun, Physics	2012 Major in Astronomy 2012 Major in Astronomy 2013 Major in Astronomy 2013 Major in Physics 2014 Major in Astronomy 2014 Major in Physics	
PHYS2260	Heat and waves		Pass in PHYS1250 Fundamental physics or PHYS1050 Physics for engineering students	Y	Y	1	Dec	 Dr F C C Ling, Physics	2012 Major in Physics 2013 Major in Physics 2014 Major in Physics	

Course Code	Title	Credit	Pre-requisite	Availa	able in	Semester offered in 2014-2015	Exam held in 2014-2015	 Course Coordinator	(The Major/Minor that this	Major / Minor course appears as a required course)
						0=year long 1=1st sem 2=2nd sem S=summer		TBC = To be confirmed	Compulsory Course (Must Take)	Core Course (With Choices)
Department	of Physics (Cont'd)									
	Modern physics		Pass in PHYS1250 Fundamental physics or PHYS1050 Physics for engineering students	Y	Y	1, 2	Dec, May	 Dr F K Chow, Physics	2012 Major in Astronomy 2012 Major in Mathematics/Physics 2012 Major in Physics 2012 Minor in Astronomy 2012 Minor in Astronomy 2012 Minor in Physics 2013 Major in Astronomy 2013 Major in Mathematics/Physics 2013 Major in Physics 2013 Minor in Astronomy 2013 Minor in Astronomy 2014 Major in Mathematics/Physics 2014 Major in Mathematics/Physics 2014 Major in Physics 2014 Minor in Physics 2014 Minor in Physics 2014 Minor in Physics	
PHYS2850	Atomic and nuclear physics	6	Pass in PHYS2265 Modern physics	N	N			 Dr S Z Zhang,		
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	 Physics Prof Z D Wang, Physics		
PHYS3350	Classical mechanics	6	Pass in PHYS2250 Introductory mechanics	Y	Y	1	Dec	 Dr S Z Zhang, Physics	2012 Major in Mathematics/Physics 2012 Major in Physics 2013 Major in Mathematics/Physics 2013 Major in Physics 2014 Major in Mathematics/Physics 2014 Major in Physics	
PHYS3351	Quantum mechanics	6	Pass in PHYS2265 Modern physics	Y	Y	1	Dec	 Dr W Yao, Physics	2012 Major in Mathematics/Physics 2012 Major in Physics 2013 Major in Mathematics/Physics 2013 Major in Physics 2014 Major in Mathematics/Physics 2014 Major in Physics	
PHYS3450	Electromagnetism	6	Pass in PHYS2255 Introductory electricity and magnetism	Y	Y	2	May	 Prof X D Cui, Physics	2012 Major in Physics 2013 Major in Physics 2014 Major in Physics	
PHYS3550	Statistical mechanics & thermodynamics	6	Pass in PHYS2260 Heat and waves	Y	Y	2	May	 Prof S Fung, Physics	2012 Major in Physics 2013 Major in Physics 2014 Major in Physics	
PHYS3551	Introductory solid state	6	Pass in PHYS2260 Heat and waves and PHYS2265 Modern physics	Y	Y	1	Dec	 Prof J Gao, Physics		
PHYS3650	physics Observational astronomy	6	PHYS22bb Modern physics  Pass in PHYS1650 Nature of the universe and (PHYS2250 Introductory mechanics or PHYS2265 Modern physics)	Y	Y	1	Dec	 Physics Dr J J L Lim, Physics	2012 Major in Astronomy 2013 Major in Astronomy 2014 Major in Astronomy	2012 Minor in Astronomy 2013 Minor in Astronomy 2014 Minor in Astronomy
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	2012 Major in Astronomy 2013 Major in Astronomy 2014 Major in Astronomy	2012 Minor in Astronomy 2013 Minor in Astronomy 2014 Minor in Astronomy
	Principles of astronomy		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	2012 Major in Astronomy 2013 Major in Astronomy 2014 Major in Astronomy	2012 Minor in Astronomy 2013 Minor in Astronomy 2014 Minor in Astronomy
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		

Course Code	Title	Credit	Pre-requisite	Avail	able in	Semester offered in 2014-2015	Exam held in 2014-2015	Course Coordinator		ajor / Minor urse appears as a required course)
						0=year long 1=1st sem 2=2nd sem S=summer		TBC = To be confirmed	Compulsory Course (Must Take)	Core Course (With Choices)
	t of Physics (Cont'd)	_								
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		
PHYS3850	Waves and optics	6	Pass in PHYS2255 Introductory electricity and magnetism and PHYS2260 Heat and waves	Y	Y	2	May	 Dr J K C Leung, Physics		
PHYS3851	Atomic and nuclear physics	6	Pass in PHYS3351 Quantum mechanics	Y	Y	2	May	 Dr S Z Zhang, Physics		
PHYS3999	Directed studies in physics		Pass in at least 24 credits of advanced level (3XXX level or above) compulsory/core 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.	Y	Y	2	No exam	 Dr J K C Leung, Physics		
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		
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, PHYS3550 Statistical Mechanics & Thermodynamics	Y	Y	2	May	 Prof H F Chau, Physics		
PHYS4350	Advanced classical mechanics	6	Pass in PHYS3350 Classical mechanics	Y	Y	2	May	 Prof S Q Shen, Physics		
PHYS4351	Advanced quantum mechanics	6	Pass in PHYS3351 Quantum mechanics	Y	Y	2	May	 Dr W Yao, Physics	2012 Major in Mathematics/Physics 2013 Major in Mathematics/Physics 2014 Major in Mathematics/Physics	
PHYS4450	Advanced electromagnetism	6	Pass in PHYS3450 Electromagnetism	Y	Y	1	Dec	 Prof X D Cui, Physics		
PHYS4550	Advanced statistical mechanics	6	Pass in PHYS3550 Statistical mechanics & thermodynamics	Y	Y	1	Dec	 Dr Y Tu, Physics		
PHYS4650	Stellar physics	6	Pass in PHYS3651 The physical universe and PHYS3351 Quantum mechanics	Y	Y	2	May	 Dr S C Y Ng, Physics		2012 Major in Astronomy 2012 Minor in Astronomy 2013 Major in Astronomy 2013 Minor in Astronomy 2014 Major in Astronomy 2014 Minor in Astronomy
PHYS4651	Selected topics in astrophysics	6	Pass in PHYS3351 Quantum mechanics or PHYS3450 Electromagnetism or PHYS3550 Statistical mechanics & thermodynamics or PHYS3651 The physical universe	N	Y			 Prof K S Cheng, Physics		2012 Major in Astronomy 2012 Minor in Astronomy 2013 Major in Astronomy 2013 Minor in Astronomy 2014 Major in Astronomy 2014 Minor in Astronomy

Course Code	Title C	Credit	Pre-requisite	Availa	able in	Semester offered in 2014-2015	Exam held in 2014-2015	Course Coordinator		Major / Minor ourse appears as a required course)
						0=year long 1=1st sem 2=2nd sem S=summer		TBC = To be confirmed	Compulsory Course (Must Take)	Core Course (With Choices)
-	t of Physics (Cont'd)									
PHYS4652	Planetary science	6	Pass in PHYS3651 The physical universe or (PHYS3350 Classical mechanics and PHYS3550 Statistical mechanics & thermodynamics)	N	Y			 Dr M H Lee, Physics		2012 Major in Astronomy 2012 Minor in Astronomy 2013 Major in Astronomy 2013 Minor in Astronomy 2014 Major in Astronomy 2014 Minor in Astronomy
PHYS4653	Cosmology	6	Pass in PHYS3651 The physical universe or PHYS3652 Principles of astronomy	Y	N	2	May	 Prof K S Cheng, Physics		2012 Major in Astronomy 2012 Minor in Astronomy 2013 Major in Astronomy 2013 Minor in Astronomy 2014 Major in Astronomy 2014 Minor in Astronomy
PHYS4654	General relativity	6	Pass in PHYS2055 Introduction to relativity and PHYS3350 Classical mechanics	Y	N	1	Dec	 Dr K M Lee, Physics		2012 Minor in Astronomy 2013 Minor in Astronomy 2014 Minor in Astronomy
PHYS4655	Interstellar medium	6	Pass in PHYS3651 The physical universe or (PHYS3351 Quantum mechanics and PHY3550 Statistical mechanics & thermodynamics)	Y	N	2	May	 Dr M H Lee, Physics		2012 Major in Astronomy 2012 Minor in Astronomy 2013 Major in Astronomy 2013 Minor in Astronomy 2014 Major in Astronomy 2014 Minor in Astronomy
PHYS4750	Experimental physics	6	TBC	N	N			 TBC, Physics		
PHYS4966	Physics internship	6	Pass in any 24 credits of advanced level (3XXX level or above) compulsory/core 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.	Y	Y	S	No exam	 Dr J C S Pun, Physics		
PHYS4999	Physics project		Pass in at least 24 credits of advanced level (3XXX level or above) compulsory/core 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.	N	Y			 Dr J K C Leung, Physics		
PHYS6350	Graduate classical	6	TBC	N	Y			 TBC,		
PHYS6351	mechanics Graduate quantum mechanics	6	TBC	N	Y			 Physics TBC, Physics		
PHYS6450	Graduate electromagnetism	6	TBC	N	Y			 TBC, Physics		
PHYS6550	Graduate statistical mechanics	6	TBC	N	N			 TBC, Physics		
PHYS6551	Solid state physics	6	TBC	N	Y			 TBC, Physics		
	Stellar atmospheres		TBC	N	N			 TBC, Physics		2012 Major in Astronomy 2012 Minor in Astronomy 2013 Major in Astronomy 2013 Minor in Astronomy 2014 Major in Astronomy 2014 Minor in Astronomy
PHYS6750	Nanophysics	6	TBC	N	Y			 TBC, Physics		

Course Code	Title	Credit	Pre-requisite	Avail	able in	Semester offered in 2014-2015	Exam held in 2014-2015	Course Coordinator		ijor / Minor rse appears as a required course)
	of Physics (Cont'd)					0=year long 1=1st sem 2=2nd sem S=summer		TBC = To be confirmed	Compulsory Course (Must Take)	Core Course (With Choices)
-	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	Y	N	1	Dec	 Dr J K C Leung, Physics		2012 Major in Environmental Science 2012 Minor in Environmental Science 2013 Major in Environmental Science 2013 Minor in Environmental Science 2014 Major in Environmental Science 2014 Minor in Environmental Science
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	N	Y			 Prof A B Djurisic, Physics		2012 Major in Environmental Science 2012 Minor in Environmental Science 2013 Major in Environmental Science 2013 Minor in Environmental Science 2014 Major in Environmental Science 2014 Minor in Environmental Science
aculty of S	Science		ı							2014 Willion III Environmental Gelence
	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	2012 Major in Astronomy 2012 Major in Biological Sciences 2012 Major in Eniological Sciences 2012 Major in Enth System Science 2012 Major in Environmental Science 2012 Major in Food & Nutritional Science 2012 Major in Geology 2012 Major in Mathematics 2012 Major in Mathematics 2012 Major in Mathematics 2012 Major in Molecular Biology & Biotechnology 2012 Major in Molecular Biology & Biotechnology 2012 Major in Risk Management 2012 Major in Risk Management 2013 Major in Statistics 2013 Major in Biological Sciences 2013 Major in Biological Sciences 2013 Major in Earth System Science 2013 Major in Eology & Biodiversity 2013 Major in Erology & Biodiversity 2013 Major in Food & Nutritional Science 2013 Major in Mathematics 2013 Major in Risk Management 2013 Major in Risk Management 2013 Major in Statistics 2014 Major in Statistics 2014 Major in Biological Sciences 2014 Major in Biological Sciences 2014 Major in Biological Sciences 2014 Major in Eology & Biodiversity 2014 Major in Biological Sciences 2014 Major in Food & Nutritional Science 2014 Major in Biological Sciences 2014 Major in Food & Nutritional Science 2014 Major in Food & Nutritional Science 2014 Major in Holocular Biology & Biodiversity 2014 Major in Food & Nutritional Science	

Course Code		Credit	: Pre-requisite	Availa	able in	Semester offered in 2014-2015	Exam held in 2014-2015		Course Coordinator	Major / Minor (The Major/Minor that this course appears	as a required course)
Faculty of 9	Science (Cont'd)					0=year long 1=1st sem 2=2nd sem S=summer			TBC = To be confirmed	Compulsory Course (Must Take)	Core Course (With Choices)
-	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	2012 Major in Biochemistry 2012 Major in Biological Sciences 2012 Major in Earth System Science 2012 Major in Earth System Science 2012 Major in Environmental Science 2012 Major in Food & Nutritional Science 2012 Major in Mathematics 2012 Major in Statistics 2012 Major in Risk Management 2012 Major in Statistics 2013 Major in Statistics 2013 Major in Statistics 2013 Major in Biological Sciences 2013 Major in Chemistry 2013 Major in Earth System Science 2013 Major in Food & Nutritional Science 2013 Major in Geology 2013 Major in Mathematics/Physics 2013 Major in Mathematics 2013 Major in Nathematics 2013 Major in Biologual Science 2013 Major in Mathematics 2013 Major in Mathematics 2013 Major in Mathematics 2014 Major in Holecular Biology & Biotechnology 2013 Major in Statistics 2014 Major in Statistics 2014 Major in Statistics 2014 Major in Biochemistry 2014 Major in Biological Sciences 2014 Major in Earth System Science 2014 Major in Environmental Science 2014 Major in Food & Nutritional Science 2014 Major in Food & Nutritional Science 2014 Major in Mathematics/Physics 2014 Major in Physics	
SCNC2121	Sustainable food production	6	Students are expected to have passed at least 30 credits of level 1 and/or level 2 science courses. Students will also need to pass an interview in order to be enrolled in the course.	Y	Y	S	No exam	32	Dr H S El-Nezami, Biological Sciences	2014 Major in Statistics	
SCNC2122	Marine life science: a North East Pacific perspective	6	Students are expected to have passed at least 30 credits of level 1 and/or level 2 science courses. Students will need to pass an interview in order to be enrolled in the course.	Y	Y	S	Summer	32	Dr T Vengatesen, Biological Sciences		

Course Code	Title	Credit	dit Pre-requisite		able in	offered in 2014-2015	Exam held in 2014-2015		(The Major/Minor that this	Major / Minor s course appears as a required course)
						0=year long 1=1st sem 2=2nd sem S=summer		TBC = To be confirmed	Compulsory Course (Must Take)	Core Course (With Choices)
Departmen	t of Statistics and Actuar									
STAT1600	Statistics: ideas and concepts		NIL	Y	Y	1, 2	Dec, May	 Prof W K Li, Statistics & Actuarial Science	2012 Major in Risk Management 2012 Major in Statistics 2013 Major in Risk Management 2013 Major in Statistics 2014 Major in Risk Management 2014 Major in Risk Management	
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	1, 2	Dec, May	 Mrs G M Jing, Statistics & Actuarial Science		2012 Major in Environmental Science 2012 Minor in Risk Management 2012 Minor in Statistics 2013 Major in Environmental Science 2013 Minor in Risk Management 2013 Minor in Statistics 2014 Major in Environmental Science 2014 Minor in Risk Management 2014 Minor in Risk Management 2014 Minor in Risk Management
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		2012 Minor in Risk Management 2012 Minor in Statistics 2013 Minor in Risk Management 2013 Minor in Statistics 2014 Minor in Risk Management 2014 Minor in Statistics
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		2012 Major in Environmental Science 2012 Minor in Risk Management 2012 Minor in Statistics 2013 Major in Environmental Science 2013 Minor in Risk Management 2013 Minor in Statistics 2014 Major in Environmental Science 2014 Minor in Risk Management 2014 Minor in Statistics

Course Code	Title	Credit	t Pre-requisite	Availa	able in		Exam held in 2014-2015	Course Coordinator	(The Major/Minor that th	Major / Minor is course appears as a required course)
			ce (Cont'd)			0=year long 1=1st sem 2=2nd sem S=summer		TBC = To be confirmed	Compulsory Course (Must Take)	Core Course (With Choices)
Departmen	t of Statistics & Actuarial Sc	ience	(Cont'd)							
	Probability and statistics I	6	Pass in MATH2014 Multivariable calculus and linear algebra, or already enrolled in this course, 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	Y	1, 2	Dec, May	 Dr Y K Chung, Statistics & Actuarial Science	2012 Major in Risk Management 2012 Major in Statistics 2013 Major in Risk Management 2013 Major in Statistics 2014 Major in Risk Management 2014 Major in Risk Statistics	2012 Minor in Actuarial Studies 2012 Minor in Risk Management 2012 Minor in Statistics 2013 Minor in Actuarial Studies 2013 Minor in Risk Management 2013 Minor in Statistics 2014 Minor in Actuarial Studies 2014 Minor in Risk Management 2014 Minor in Risk Management 2014 Minor in Statistics
STAT2602	Probability and statistics II	6	Pass in STAT2601 Probability and statistics I	Y	Y	1, 2	Dec, May	 Dr Y K Chung, Statistics & Actuarial Science	2012 Major in Risk Management 2012 Major in Statistics 2013 Major in Statistics 2013 Major in Statistics 2014 Major in Risk Management 2014 Major in Statistics	2012 Minor in Actuarial Studies 2012 Minor in Risk Management 2012 Minor in Statistics 2013 Minor in Actuarial Studies 2013 Minor in Risk Management 2013 Minor in Statistics 2014 Minor in Actuarial Studies 2014 Minor in Risk Management 2014 Minor in Risk Management 2014 Minor in Statistics
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	 Dr C W Kwan, Statistics & Actuarial Science	2012 Major in Risk Management 2012 Major in Statistics 2013 Major in Risk Management 2013 Major in Statistics	2012 Minor in Risk Management 2012 Minor in Statistics 2013 Minor in Risk Management 2013 Minor in Statistics 2014 Minor in Risk Management 2014 Minor in Statistics
STAT2605	Demographic and socio- economic statistics	6	(Level 2 or above in HKDSE Mathematics or Level 2 or above in HKDSE Mathematics Exended Module 1 or 2 or equvialent); and Pass in or already enrolled in any of these courses: BIOL2102 Biostatistics, ECON1280 Analysis of economic data, STAT1601 Elementary statistical methods, STAT1602 Business statistics, STAT2601 Probability and statistics I, STAT1603 Introductory statistics, STAT2901 Probability and statistics: foundations of actuarial science	Y	Y	2	May	 Ms L M S Kwan, Statistics & Actuarial Science		2012 Minor in Actuarial Studies 2012 Minor in Statistics 2013 Minor in Actuarial Studies 2013 Minor in Statistics 2014 Minor in Actuarial Studies 2014 Minor in Actuarial Studies 2014 Minor in Statistics

Course Code	Title	Credit	Pre-requisite	Availa	able in	Semester offered in 2014-2015	Exam held in 2014-2015	 Course Coordinator	(The Major/Minor that th	Major / Minor nis course appears as a required course)
						0=year long 1=1st sem 2=2nd sem S=summer		TBC = To be confirmed	Compulsory Course (Must Take)	Core Course (With Choices)
Departmen	t of Statistics & Actuarial S	Science	(Cont'd)							
STAT2901	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 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	Y	Y	2	May	 Dr Y K Chung, Statistics & Actuarial Science	2012 BSc in Actuarial Science 2013 BSc in Actuarial Science 2014 BSc in Actuarial Science	2012 Minor in Actuarial Studies 2013 Minor in Actuarial Studies 2014 Minor in Actuarial Studies
STAT2902	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	2012 BSc in Actuarial Science 2013 BSc in Actuarial Science 2014 BSc in Actuarial Science	
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	2012 Major in Risk Management 2012 Major in Statistics 2013 Major in Risk Management 2013 Major in Statistics 2014 Major in Risk Management 2014 Major in Statistics	2012 Minor in Statistics 2013 Minor in Statistics 2014 Minor in Statistics
STAT3602	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		2012 BSc in Actuarial Science 2012 Major in Statistics 2012 Minor in Statistics 2013 BSc in Actuarial Science 2013 Major in Statistics 2013 Minor in Statistics 2014 BSc in Actuarial Science 2014 Major in Statistics 2014 Minor in Statistics
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 K S Chong, Statistics & Actuarial Science	2012 Major in Statistics 2013 Major in Statistics 2014 Major in Statistics	2012 Major in Risk Management 2012 Minor in Statistics 2013 Major in Risk Management 2013 Minor in Statistics 2014 Major in Risk Management 2014 Minor in Statistics
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		2012 Major in Statistics 2012 Minor in Statistics 2013 Major in Statistics 2013 Minor in Statistics 2014 Major in Statistics 2014 Minor in Statistics 2014 Minor in Statistics

Course	Title	Credit	Pre-requisite	Avail	able in	Semester	Exam held	Quota	Course Coordinator	Major	/ Minor		
Code						offered in 2014-2015	in 2014-2015			(The Major/Minor that this course			
			ice (Cont'd)			0=year long 1=1st sem 2=2nd sem S=summer			TBC = To be confirmed	Compulsory Course (Must Take)	Core Course (With Choices)		
-	t of Statistics & Actuarial S		<u> </u>		_								
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 STAT2902 Statistical models	Y	Y	2	May		Dr K S Chong, Statistics & Actuarial Science	2 2 2 2 2 2	2012 Major in Statistics 2012 Minor in Statistics 2013 Major in Statistics 2013 Minor in Statistics 2014 Minor in Statistics 2014 Major in Statistics 2014 Minor in Statistics		
STAT3606	Business logistics	6	course) or STAT3902 Statistical models 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	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	(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	Y	Y	1	Dec		Ms O T K Choi, Statistics & Actuarial Science	2 2 2 2 2 2	2012 Major in Statistics 2012 Minor in Statistics 2013 Major in Statistics 2013 Minor in Statistics 2014 Major in Statistics 2014 Major in Statistics 2014 Minor in Statistics
STAT3607	Statistics in clinical medicine and bio-medical research	6	have already enrolled in this course. Pass in STAT2602 Probability and statistics II or STAT3902 Statistical models	Y	Y	2	May		Prof G Yin, Statistics & Actuarial Science	2 2 2 2 2	2012 Major in Statistics 2012 Minor in Statistics 2013 Major in Statistics 2013 Minor in Statistics 2014 Major in Statistics 2014 Minor in Statistics		
	Statistical genetics		Pass in STAT2602 Probability and statistics II or STAT3902 Statistical models	Y	Y	2	May		Prof T W K Fung, Statistics & Actuarial Science	2 2 2 2 2 2 2	2012 Major in Statistics 2012 Minor in Statistics 2013 Major in Statistics 2013 Minor in Statistics 2014 Major in Statistics 2014 Minor in Statistics		
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	2013 Major in Risk Management 2	2012 Minor in Risk Management 2013 Minor in Risk Management 2014 Minor in Risk Management		

Course Code	Title	Credit	Pre-requisite		able in	offered in 2014-2015	Exam held in 2014-2015				ajor / Minor urse appears as a required course)
	at of Statistics & Actuarial	Salamaa	e (Cont'd)			0=year long 1=1st sem 2=2nd sem S=summer			TBC = To be confirmed	Compulsory Course (Must Take)	Core Course (With Choices)
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	Y	Y	2	May		Dr R W L Wong, Statistics & Actuarial Science		2012 Major in Risk Management 2012 Minor in Risk Management 2013 Major in Risk Management 2013 Minor in Risk Management 2014 Major in Risk Management
			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								2014 Major in Risk Management 2014 Minor in Risk Management
STAT3611	Computer-aided data analysis	6	students) 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 statistics I, STAT2901 Probability and statistics: foundations of actuarial science, STAT3616 Advanced SAS programming	N	N				Dr E K F Lam, Statistics & Actuarial Science		2012 Major in Environmental Science 2012 Minor in Risk Management 2012 Minor in Statistics 2013 Major in Environmental Science 2013 Minor in Risk Management 2013 Minor in Statistics 2014 Major in Environmental Science 2014 Minor in Risk Management 2014 Minor in Risk Management
STAT3612	Data mining	6	programming Pass in STAT2602 Probability and statistics II or (STAT1603 Introductory statistics and any University level 2 course) or STAT3902 Statistical models	Y	Y	2	No exam	10	Dr G C S Lui, Statistics & Actuarial Science		2012 BSc in Actuarial Science 2012 Major in Risk Management 2012 Major in Statistics 2012 Minor in Risk Management 2012 Minor in Statistics 2013 BSc in Actuarial Science 2013 Major in Risk Management 2013 Major in Statistics 2013 Minor in Statistics 2013 Minor in Statistics 2014 BSc in Actuarial Science 2014 BSc in Actuarial Science 2014 Major in Statistics 2014 Major in Statistics 2014 Minor in Risk Management 2014 Minor in Risk Management

Course Code	Title	Credit	Pre-requisite	Avail	able in	Semester offered in 2014-2015	Exam held in 2014-2015		Course Coordinator		njor / Minor rse appears as a required course)
						0=year long 1=1st sem 2=2nd sem S=summer			TBC = To be confirmed	Compulsory Course (Must Take)	Core Course (With Choices)
-	t of Statistics & Actuarial Sc		<u>'</u>		_						
	Marketing engineering		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	Y	Y	1	Dec		Dr C W Kwan, Statistics & Actuarial Science		2012 Major in Statistics 2012 Minor in Statistics 2013 Major in Statistics 2013 Minor in Statistics 2014 Major in Statistics 2014 Minor in Statistics
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) or (STAT1603 Introductory 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		2012 Minor in Risk Management 2012 Minor in Statistics 2013 Minor in Risk Management 2013 Minor in Statistics 2014 Minor in Risk Management 2014 Minor in Risk Management
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 statistics: foundations of actuarial statistics: and such as the statistics and statistics foundations of actuarial statistics: foundations of actuarial statistics: foundations of actuarial statistics: foundations of actuarial statistics: and statistics: foundations of actuarial statistics: foundations of actuarial statistics: foundations of actuarial statistics and statistics foundations of actuarial statistics.	Y	Y	2	May		Prof K C Yuen, Statistics & Actuarial Science	2012 Major in Risk Management 2013 Major in Risk Management 2014 Major in Risk Management	2012 Minor in Actuarial Studies 2012 Minor in Risk Management 2013 Minor in Actuarial Studies 2013 Minor in Risk Management 2014 Minor in Actuarial Studies 2014 Minor in Risk Management
STAT3616	Advanced SAS programming	6	STAT2601 Probability and statistics I or STAT2901 Probability and statistics: for 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	10	Prof K W Ng, Statistics & Actuarial Science		2012 BSc in Actuarial Science 2012 Major in Statistics 2012 Minor in Statistics 2013 BSc in Actuairal Science 2013 Major in Statistics 2013 Minor in Statistics 2014 BSc in Actuairal Science 2014 Major in Statistics 2014 Minor in Statistics

Course Code	Title	Credit	Pre-requisite		able in	offered in 2014-2015	Exam held in 2014-2015		Course Coordinator	(The Major/Minor that this	Major / Minor course appears as a required course)
						0=year long 1=1st sem 2=2nd sem S=summer			TBC = To be confirmed	Compulsory Course (Must Take)	Core Course (With Choices)
Departmen	t of Statistics & Actuarial S		· ,								
STAT3617	Sample survey methods		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		2012 Major in Statistics 2012 Minor in Statistics 2013 Major in Statistics 2013 Minor in Statistics 2014 Major in Statistics 2014 Minor in Statistics
STAT3618	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 passed in FINA2322 Derivatives, or have already enrolled in this course.	Y	Y	1	Dec		Dr R W L Wong, Statistics & Actuarial Science		2012 Major in Risk Management 2012 Minor in Risk Management 2013 Major in Risk Management 2013 Minor in Risk Management 2014 Major in Risk Management 2014 Minor in Risk Management
STAT3620	Modern nonparametric statistics		Pass in STAT2602 Probability and statistics II	Y	Y	1	Dec		Dr P L H Yu, Statistics & Actuarial Science		2012 Major in Statistics 2012 Minor in Statistics 2013 Major in Statistics 2013 Minor in Statistics 2014 Major in Statistics 2014 Minor in Statistics
STAT3621	Statistical data analysis		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	10	Dr G Tian, Statistics & Actuarial Science		2012 Major in Statistics 2012 Minor in Statistics 2013 Major in Statistics 2013 Minor in Statistics 2014 Major in Statistics 2014 Mior in Statistics 2014 Minor in Statistics

Course Title Credit			it Pre-requisite		able in	Semester	Exam held	Ouota	Course Coordinator		
Code	Title	Crean	. Fie-requisite	Availe	able III		in 2014-2015		Course Coordinator		ajor / Minor irse appears as a required course)
						0=year long 1=1st sem 2=2nd sem S=summer			TBC = To be confirmed	Compulsory Course (Must Take)	Core Course (With Choices)
Departmen	t of Statistics & Actuarial Sc	cience	(Cont'd)			0=3ullillel	I		I.		
-	Directed studies in statistics		Pass in at least 24 credits of advanced level compulsory/core courses (STAT3XXX, STAT4XXX or STAT6XXX) in the Major in Risk Management / Statistics; and Pass in 18 credits from: STAT1601 Elementary statistical methods, STAT1602 Business statistics, STAT2601 Probability and statistics I, STAT2602 Probability and statistics II, STAT2603 Data management with SAS, STAT1603 Introductory statistics, STAT2605 Introduction to demographic and socio-economic statistics, STAT2901 Probability and statistics: foundations of actuarial science, STAT2901 Probability and statistics: foundations of actuarial science, STAT2901 Prohability and statistics: foundations of actuarial science, STAT2901 Financial mathematics; and Not for students who have already enrolled in STAT4672 Statistics project in this academic year.  This capstone course is for Risk Management, and Statistics Majors students only; and consent of Major Coordinator.	N	Y			30	Prof S M S Lee, Statistics & Actuarial Science		
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		Dr E C K Cheung, Statistics & Actuarial Science	2012 BSc in Actuarial Science 2013 BSc in Actuarial Science 2014 BSc in Actuarial Science	2012 Minor in Actuarial Studies 2013 Minor in Actuarial Studies 2014 Minor in Actuarial Studies
STAT3902	Statistical models	6	Pass in STAT2901 Probability and statistics: foundations of actuarial science; and For BSc(Actuarial Science) students only.	Y	Y	1	Dec		Dr G Tian, Statistics & Actuarial Science	2012 BSc in Actuarial Science 2013 BSc in Actuarial Science 2014 BSc in Actuarial Science	
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	May		Dr K S Chong, Statistics & Actuarial Science	2012 BSc in Actuarial Science 2013 BSc in Actuarial Science 2014 BSc in Actuarial Science	

Course Code	Title	Credit	Pre-requisite	Availa	able in		Exam held in 2014-2015	Course Coordinator	(The Major/Minor that this	Major / Minor course appears as a required course)
						0=year long 1=1st sem 2=2nd sem S=summer		TBC = To be confirmed	Compulsory Course (Must Take)	Core Course (With Choices)
Department	t of Statistics & Actuarial Sc	ience (	(Cont'd)							
STAT3904	Corporate finance for actuarial science		[(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	2012 BSc in Actuarial Science 2013 BSc in Actuarial Science 2014 BSc in Actuarial Science	2012 Minor in Actuarial Studies 2013 Minor in Actuarial Studies 2014 Minor in Actuarial Studies
STAT3905	Introduction to financial derivatives		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	2012 BSc in Actuarial Science 2013 BSc in Actuarial Science 2014 BSc in Actuarial Science	
TAT3906	Risk theory I	6	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	2012 BSc in Actuarial Science 2013 BSc in Actuarial Science 2014 BSc in Actuarial Science	2012 Minor in Actuarial Studies 2013 Minor in Actuarial Studies 2014 Minor in Actuarial Studies
	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	 Prof Y Lam, Statistics & Actuarial Science	2012 BSc in Actuarial Science 2013 BSc in Actuarial Science 2014 BSc in Actuarial Science	
	Credibility theory and loss distributions		Pass in STAT2602 Probability and statistics II or STAT3902 Statistical models or STAT3906 Risk theory	Y	Y	1	Dec	 Dr K C Cheung, Statistics & Actuarial Science	2012 BSc in Actuarial Science 2013 BSc in Actuarial Science 2014 BSc in Actuarial Science	2012 Minor in Actuarial Studies 2013 Minor in Actuarial Studies 2014 Minor in Actuarial Studies
3TAT3909	Advanced life contingencies		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	2012 BSc in Actuarial Science 2013 BSc in Actuarial Science 2014 BSc in Actuarial Science	

Course Code	Title	Credit	Pre-requisite	Availa	able in		Exam held in 2014-2015	 Course Coordinator	(The Major/Minor that th	Major / Minor is course appears as a required course)
						0=year long 1=1st sem 2=2nd sem S=summer		TBC = To be confirmed	Compulsory Course (Must Take)	Core Course (With Choices)
epartment	of Statistics & Actuarial S	cience (	Cont'd)							
STAT3910	Financial economics I		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	2012 BSc in Actuarial Science 2013 BSc in Actuarial Science 2014 BSc in Actuarial Science	2012 Minor in Actuarial Studies 2013 Minor in Actuarial Studies 2014 Minor in Actuarial Studies
STAT3911	Financial economics II		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	2012 BSc in Actuarial Science 2013 BSc in Actuarial Science 2014 BSc in Actuarial Science	2012 Major in Risk Management 2012 Minor in Actuarial Studies 2013 Major in Risk Management 2013 Minor in Actuarial Studies 2014 Major in Risk Management 2014 Minor in Actuarial Studies
STAT3951	Advanced contingencies		Pass in STAT3909 Advanced life contingencies; and For BSc(Actuarial Science) students only.	Y	Y	1	Dec	 Dr E C K Cheung, Statistics & Actuarial Science		2012 BSc in Actuarial Science 2013 BSc in Actuarial Science 2014 BSc in Actuarial Science
	Investment and asset management		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		2012 BSc in Actuarial Science 2013 BSc in Actuarial Science 2014 BSc in Actuarial Science
	Fundamentals of actuarial practice		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		2012 BSc in Actuarial Science 2013 BSc in Actuarial Science 2014 BSc in Actuarial Science
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		2012 BSc in Actuarial Science 2013 BSc in Actuarial Science 2014 BSc in Actuarial Science
TAT3955	Survival analysis	6	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 E K F Lam, Statistics & Actuarial Science		2012 BSc in Actuarial Science 2012 Major in Statistics 2012 Minor in Statistics 2013 BSc in Actuarial Science 2013 Major in Statistics 2013 Minor in Statistics 2014 BSc in Actuarial Science 2014 Major in Statistics 2014 Major in Statistics
	Pension funds and pension mathematics		Pass in STAT3909 Advanced life contingencies	Y	Y	1	Dec	 Prof G Ma, Statistics & Actuarial Science		2012 BSc in Actuarial Science 2013 BSc in Actuarial Science 2014 BSc in Actuarial Science

Course Code	Title	Credit	Pre-requisite	Avail	able in	Semester offered in 2014-2015	Exam held in 2014-2015		Course Coordinator	(The Major/Minor that th	Major / Minor is course appears as a required course)
						0=year long 1=1st sem 2=2nd sem S=summer	-		TBC = To be confirmed	Compulsory Course (Must Take)	Core Course (With Choices)
<u> </u>	t of Statistics & Actuarial S		· ,		_						
	Time-series analysis		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	Dec		Dr G Li, Statistics & Actuarial Science	2012 Major in Risk Management 2012 Major in Statistics 2013 Major in Statistics 2013 Major in Statistics 2014 Major in Risk Management 2014 Major in Risk Management 2014 Major in Statistics	2012 Minor in Risk Management 2012 Minor in Statistics 2013 Minor in Risk Management 2013 Minor in Statistics 2014 Minor in Risk Management 2014 Minor in Statistics
STAT4602	Multivariate data analysis	6	Pass in STAT3600 Linear statistical analysis or STAT3907 Linear models and forecasting	Y	Y	2	May	6	Prof T W K Fung, Statistics & Actuarial Science	2012 Major in Statistics 2013 Major in Statistics 2014 Major in Statistics	2012 BSc in Actuarial Science 2012 Minor in Statistics 2013 BSc in Actuarial Science 2013 Minor in Statistics 2014 BSc in Actuarial Science 2014 Minor in Statistics
STAT4603	Current topics in risk management	6	Pass in STAT4601 Time-series analysis	N	Y				TBC, Statistics & Actuarial Science		2012 Major in Risk Management 2012 Minor in Risk Management 2013 Major in Risk Management 2013 Minor in Risk Management 2014 Major in Risk Management 2014 Minor in Risk Management
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		2012 Major in Risk Management 2012 Minor in Risk Management 2013 Major in Risk Management 2013 Minor in Risk Management 2014 Major in Risk Management 2014 Minor in Risk Management
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		2012 BSc in Actuarial Science 2012 Major in Risk Management 2012 Minor in Risk Management 2013 BSc in Actuarial Science 2013 Major in Risk Management 2013 Minor in Risk Management 2014 BSc in Actuarial Science 2014 Major in Risk Management 2014 Minor in Risk Management
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		2012 BSc in Actuarial Science 2012 Major in Risk Management 2012 Minor in Risk Management 2013 BSc in Actuarial Science 2013 Major in Risk Management 2013 Minor in Risk Management 2014 BSc in Actuarial Science 2014 Major in Risk Management 2014 Minor in Risk Management
STAT4710	Capstone experience for statistics/risk management undergraduates	6	Students are expected to have satisfactorily completed at least 24 credits advanced level (STAT3XXX, STAT4XXX or STAT6XXX) compulsory/core courses in 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 Risk Management, and Statistics Majors students only.	N	Y				Prof W K Li, Statistics & Actuarial Science		

Course Code	Title	Credit		Available in			Exam held in 2014-2015	Quota	Course Coordinator	Major / Minor (The Major/Minor that this course appears as a required course)		
						0=year long 1=1st sem 2=2nd sem S=summer			TBC = To be confirmed	Compulsory Course (Must Take)	Core Course (With Choices)	
<u> </u>	t of Statistics & Actuarial Sc		<u>'</u>									
	Capstone experience for actuarial science undergraduates		Pass in at least 24 credits of advanced level compulsory/core 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.		Y				Prof W K Li, Statistics & Actuarial Science			
STAT4766	Statistics internship	6	Pass in at least 24 credits of advanced level compulsory/core courses (STAT3XXX, STAT4XXX or STAT6XXX) in the Risk Management, and Statistics Majors. Students are expected to have satisfactorily completed their Year 3 study. This capstone course is for Risk Management, and Statistics Majors students only.	Y	Y	2, S	No exam		Dr P L H Yu, Statistics & Actuarial Science			
STAT4767	Actuarial science internship	6	Pass in at least 24 credits of advanced level compulsory/core 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.	Y	Y	2	No exam		Dr L F K Ng, Statistics & Actuarial Science			
STAT4798	Statistics and actuarial science project	6	Pass in at least 24 credits of advanced level compulsory/core 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.		Y				Prof S M S Lee, Statistics & Actuarial Science			

Course Code	Title	Credit	Pre-requisite			offered in 2014-2015	Exam held in 2014-2015		Course Coordinator	Major / Minor (The Major/Minor that this course appears as a required course)	
						0=year long 1=1st sem 2=2nd sem S=summer			TBC = To be confirmed	Compulsory Course (Must Take)	Core Course (With Choices)
	of Statistics & Actuarial S		<u>'</u>								
STAT4799	Statistics project		Pass in at least 24 credits of advanced level compulsory/core courses (STAT3XXX, STAT4XXX or STAT6XXX) in the Major in Risk Management / Statistics 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 Timeseries analysis; STAT4602 Multivariate data analysis; and Not for students who have already enrolled in STAT3671 Directed studies in statistics in this academic year. This capstone course is for Risk Management, and Statistics Majors students only.		Y			15	Prof S M S Lee, Statistics & Actuarial Science		
STAT4901	Risk theory II		Pass in STAT3906 Risk theory I	Y	Y	2	May		Dr J K Woo, Statistics & Actuarial Science		2012 BSc in Actuarial Science 2013 BSc in Actuarial Science 2014 BSc in Actuarial Science
STAT4902	Selected topics in actuarial science	6	Pass in STAT3906 Risk theory I	N	N				TBC, Statistics & Actuarial Science		2012 BSc in Actuarial Science 2013 BSc in Actuarial Science 2014 BSc in Actuarial Science 2014 BSc in Actuarial Science
STAT4903	Actuarial techniques for general insurance	6	Pass in STAT3906 Risk theory I	N	Y				Dr L F K Ng, Statistics & Actuarial Science		2012 BSc in Actuarial Science 2012 Minor in Actuarial Studies 2013 BSc in Actuarial Science 2013 Minor in Actuarial Studies 2014 BSc in Actuarial Science 2014 Minor in Actuarial Studies
STAT6110	Advanced probability		Pass in STAT3603 Probability modelling or STAT3903 Stochastic models	Y	Y	1	Dec		Prof Y Lam, Statistics & Actuarial Science		
STAT6111	Computational statistics		Pass in STAT3600 Linear statistical analysis or STAT3907 Linear models and forecasting	Y	Y	1	Dec		Dr G Tian, Statistics & Actuarial Science		
STAT6114	Advanced statistical modelling	6	Pass in STAT3600 Linear statistical analysis	Y	Y	2	May		Dr J F Yao, Statistics & Actuarial Science		
STAT6115	Advanced quantitative risk management and finance	6	Pass in STAT4608 Market risk analysis	N	Y				Prof W K Li, Statistics & Actuarial Science		
STAT7109	Research methods in statistics		Pass in STAT3600 Linear statistical analysis or STAT3907 Linear models and forecasting	Y	Y	1	Dec		Dr J F Yao, Statistics & Actuarial Science		

Course Code	Title	Credit	Pre-requisite	Available in			Exam held in 2014-2015		Course Coordinator	Major / Minor (The Major/Minor that this course appears as a required course)	
						0=year long 1=1st sem 2=2nd sem S=summer			TBC = To be confirmed	Compulsory Course (Must Take)	Core Course (With Choices)
	ore Courses *										
CCCH9020	Science and Technology: Lessons from China	6	NIL	Y	Y	1	Dec	120	Prof L S Chan, Earth Sciences		
CCGL9016	Feeding the World	6	NIL	Y	Y	1	No exam	120	Prof H Corke, Biological Sciences		
CCGL9017	Food: Technology, Trade and Culture	6	NIL	Y	Y	2	May	120	Prof H Corke, Biological Sciences		
CCGL9033	Weapons of Mass Destruction: Science, Proliferation and Terrorism	6	NIL	Y	Y	2	No exam	120	Dr K H Lemke, Earth Sciences		
CCGL9043	Obesity: Beyond a Health	6		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	80	Prof S Kwok,		
CCST9013	Our Living Environment	6	NIL	Y	Y	2	No exam	120	Praculty Dr S C Chang,		
CCST9014	Science and Music	6	NIL	Y	Y	1	No exam	120	Earth Sciences Prof H F Chau,		
CCST9017	Hidden Order in Daily Life: A Mathematical Perspective	6	NIL	Y	Y	1	No exam	120	Physics Dr T W Ng, Mathematics		
CCST9018	Origin and Evolution of Life	6	NIL	Y	Y	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	Y	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	2	No exam	120	Prof H F Chau, Physics		
CCST9023	The Oceans: Science and Society	6	NIL	Y	Y	1	No exam	120	Dr S C Chang, Earth Sciences		
CCST9026	Scientific Revolutions and their Impact on Modern Societies	6	NIL	Y	Y	1	No exam	120	Prof K S Cheng, 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	120	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 N K Tsing, 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		
CCST9045	The Science and Lore of Culinary Culture	6	NIL	Y	Y	2	No exam	120	Prof G H Chen, Chemistry		
CCST9046	The Science of Mind-body- health Relationship	6	NIL	Y	Y	1	Dec	120	Dr H S El-Nezami, Biological Sciences		
CCST9048	Simplifying Complexity	6	NIL	Y	Y	1	No exam	120	Dr T Bonebrake, Biological Sciences		

<sup>\*</sup> Please refer to http://commoncore.hku.hk for the details of the common core courses.

**Equivalency of HKDSE and other qualifications** 

SCIENCE

# SECTION V Equivalency of HKDSE and other qualifications

# **Table of Equivalence between HKDSE and Other Qualifications**

HIZDGE	C 1-	Equivalent Qualification to HKDSE										
HKDSE	Grade	IB	GCE	SATII	AP	Gao Kao (高考)						
Biology	3 or above	Biology (SL/HL)	Biology (AL)	Biology	Biology							
Chemistry	3 or above	Chemistry (SL/HL)	Chemistry (AL)	Chemistry	Chemistry							
Physics	3 or above	Physics (SL/HL)	Physics (AL)	Physics	Physics B or C	Equivalent to 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 2014-15

# SCIENCE

# SECTION VI Science Majors on offer in 2014/15

# Majors offered by Science Faculty

# **Majors** (15)

Statistics

Astronomy
Biochemistry
Biological Sciences
Chemistry
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

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:

- (1) identify and describe astrophysical phenomena with their professional knowledge
- (by means of coursework and tutorial classes in the curriculum)
- (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)
- (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)
- (4) communicate and collaborate with people effectively in scientific issues
- (by means of group projects, tutorial sessions and presentation opportunities in the curriculum)
- (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)

## **Science Foundation Courses (12 credits)**

SCNC1111 Scientific method and reasoning (6)

SCNC1112 Fundamentals of modern science (6)

# **Disciplinary 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)

PHYS3650 Observational astronomy (6)

PHYS3651 The physical universe (6)

PHYS3652 Principles of astronomy (6)

Plus at least 12 credits selected from the following courses:

PHYS4650 Stellar physics (6)

PHYS4651 Selected topics in astrophysics (6)

PHYS4652 Planetary science (6)

PHYS4653 Cosmology (6)

PHYS4655 Interstellar medium (6)

PHYS6650

Plus at least 12 credits of advanced level Physics courses (PHYS3XXX or PHYS4XXX or PHYS6XXX level), subject to prerequisite requirements.

## 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 ('must take') 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 ("must take") 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) 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 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 in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.
- 5. Courses at the advanced level and capstone requirements are subject to change.
- 6. Students must have level 3 or above in HKDSE Physics or equivalent to take this major. Students who do not fulfill this requirement are advised to take PHYS1240 Physics by inquiry.

#### Remarks:

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

2013

admitted to Year 1 in

#### **Objectives:**

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

#### **Learning Outcomes:**

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

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- (by means of coursework and tutorial classes in the curriculum)
- (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)
- (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)
- (4) communicate and collaborate with people effectively in scientific issues
- (by means of group projects, tutorial sessions and presentation opportunities in the curriculum)
- (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)

## **Science Foundation Courses (12 credits)**

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SCNC1112 Fundamentals of modern science (6)

## **Disciplinary Courses (36 credits)**

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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)

PHYS3650 Observational astronomy (6)

PHYS3651 The physical universe (6)

PHYS3652 Principles of astronomy (6)

Plus at least 12 credits selected from the following courses:

PHYS4650 Stellar physics (6)

PHYS4651 Selected topics in astrophysics (6)

PHYS4652 Planetary science (6)

PHYS4653 Cosmology (6)

PHYS4655 Interstellar medium (6)

PHYS6650

Plus at least 12 credits of advanced level Physics courses (PHYS3XXX or PHYS4XXX or PHYS6XXX level), subject to prerequisite requirements.

## 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 ('must take') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
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- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.
- 5. Courses at the advanced level and capstone requirements are subject to change.
- 6. Students must have level 3 or above in HKDSE Physics or equivalent to take this major. Students who do not fulfill this requirement are advised to take PHYS1240 Physics by inquiry.

#### Remarks:

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

admitted to 1 car 1

#### **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:

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- (3) analyze astrophysical problems qualitatively and quantitatively, and recognize moral and ethical issues related to the discipline
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- (4) communicate and collaborate with people effectively in scientific issues
- (by means of group projects, tutorial sessions and presentation opportunities in the curriculum)
- (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)

## **Science Foundation Courses (12 credits)**

SCNC1111 Scientific method and reasoning (6)

SCNC1112 Fundamentals of modern science (6)

# **Disciplinary 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)

PHYS3650 Observational astronomy (6)

PHYS3651 The physical universe (6)

PHYS3652 Principles of astronomy (6)

Plus at least 12 credits selected from the following courses:

PHYS4650 Stellar physics (6)

PHYS4651 Selected topics in astrophysics (6)

PHYS4652 Planetary science (6)

PHYS4653 Cosmology (6)

PHYS4655 Interstellar medium (6)

PHYS6650

Plus at least 12 credits of advanced level Physics courses (PHYS3XXX or PHYS4XXX or PHYS6XXX level), subject to prerequisite requirements.

# 3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:

PHYS3999 Directed studies in physics (6)

PHYS4966 Physics internship (6)

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#### Notes

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('must take') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
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- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course 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 in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.
- 5. Courses at the advanced level and capstone requirements are subject to change.
- 6. Students must have level 3 or above in HKDSE Physics or equivalent to take this major. Students who do not fulfill this requirement are advised to take PHYS1240 Physics by inquiry.

#### Remarks:

Major Title Major in 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:

- (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)
- (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)
- (3) interpret and communicate scientific data and literature using appropriate scientific language
- (by means of literature-based coursework and debate)
- (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)
- (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)

## Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6)

SCNC1112 Fundamentals of modern science (6)

#### **Disciplinary Courses (36 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)

CHEM2541 Introductory Physical Chemistry (6)

# 2. Advanced level courses (42 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)

Plus 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 ('must take') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.

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- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.

- 5. Courses at the advanced level and capstone requirements are subject to change.
- 6. 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.

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:

- (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)
- (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)
- (3) interpret and communicate scientific data and literature using appropriate scientific language
- (by means of literature-based coursework and debate)
- (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)
- (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)

## Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6)

SCNC1112 Fundamentals of modern science (6)

#### **Disciplinary Courses (36 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)

CHEM2541 Introductory Physical Chemistry (6)

# 2. Advanced level courses (42 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)

Plus 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

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Major Title Major in Biochemistry

Offered to students admitted to Year 1 in

2012

#### Objectives:

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#### Impermissible Combination:

Minor in Biochemistry

# Required courses (96 credits)

#### 1. Introductory level courses (48 credits)

## Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6)

SCNC1112 Fundamentals of modern science (6)

#### **Disciplinary Courses (36 credits)**

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BIOL1110 From molecules to cells (6)

CHEM1042 General chemistry I (6)

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CHEM2441 Organic chemistry I (6)

CHEM2541 Introductory Physical Chemistry (6)

# 2. Advanced level courses (42 credits)

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BIOC3604 Essential techniques in biochemistry and molecular

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BIOL3401 Molecular biology (6)

BIOC4610 Advanced biochemistry (6)

BIOC4613 Advanced techniques in biochemistry & molecular

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Plus at least 12 credits selected from the following courses:

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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)

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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 ('must take') 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 ("must take") 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) 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 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 in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.

- 5. Courses at the advanced level and capstone requirements are subject to change.
- 6. 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.

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:

- (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)
- (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)
- (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)
- (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)
- (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)
- (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:

NII.

# Required courses (96 credits)

## 1. Introductory level courses (48 credits)

## Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6)

SCNC1112 Fundamentals of modern science (6)

#### **Disciplinary 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)

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. 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 ('must take') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
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- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.
- 5. Courses at the advanced level and capstone requirements are subject to change.

Major Title Major in Biological Sciences

Offered to students

admitted to Year 1 in

#### 2013

## Objectives:

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- (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
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- (by means of coursework, tutorial classes, project-based and presentation opportunities in the curriculum)
- (6) be prepared to enter employment as professional scientists, educators and managers
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# Impermissible Combination:

NII.

# Required courses (96 credits)

## 1. Introductory level courses (48 credits)

## Science Foundation Courses (12 credits)

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#### **Disciplinary Courses (36 credits)**

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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)

Students must select at least 1 course from each of the following area A, B, C & D:

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BIOL3108 Microbial physiology (6)

BIOL3205 Human physiology (6)

# (C) Diversity of life and environmental biology

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

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BIOL3302 Systematics and phylogenetics (6)

## (D) Applied biology

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BIOL4301 Fish and fisheries (6)

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BIOL4994 Biological sciences project (12)

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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 in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.
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Major Title Major in Biological Sciences

Offered to students

admitted to Year 1 in

2012

## Objectives:

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# Impermissible Combination:

NIL

# Required courses (96 credits)

## 1. Introductory level courses (48 credits)

# Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6)

SCNC1112 Fundamentals of modern science (6)

#### **Disciplinary Courses (36 credits)**

BIOL1110 From molecules to cells (6)

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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)

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BIOL4994 Biological sciences project (12)

#### Notes:

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('must take') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
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- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.
- 5. Courses at the advanced level and capstone requirements are subject to change.

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:

- (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)
- (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)
- (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)
- (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)
- (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)
- (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)

# **Science Foundation Courses (12 credits)**

SCNC1111 Scientific method and reasoning (6)

SCNC1112 Fundamentals of modern science

(6)

# **Disciplinary Courses (30 credits)**

CHEM1042 General chemistry I (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 (48 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)

Plus at least 12 credits selected from the following 18 credits of courses in two different areas:

CHEM4341 Advanced inorganic chemistry (6)

CHEM4441 Advanced organic chemistry (6) May take either CHEM4443 or CHEM4441 to

fulfill this 12 credits requirement, but not both.

CHEM4443 Integrated organic synthesis (6) May take either CHEM4443 or CHEM4441 to

fulfill this 12 credits requirement, but not both.

CHEM4541 Physical chemistry III: statistical

thermodynamics and kinetics

theory (6)

Plus 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 and CHEM4966 Chemistry internship), subject to pre-requisite requirements.

# 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 ('must take') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
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- 5. Courses at the advanced level and capstone requirements are subject to change.
- 6. 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.

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.

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

- (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
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Major Title Major in Chemistry

Offered to students admitted to Year 1 in

2012

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- (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)
- (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)
- (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)
- (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)
- (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)
- (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)

# Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6)

SCNC1112 Fundamentals of modern science

(6)

# **Disciplinary Courses (30 credits)**

CHEM1042 General chemistry I (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 (48 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)

Plus at least 12 credits selected from the following 18 credits of courses in two different areas:

CHEM4341 Advanced inorganic chemistry (6)

CHEM4441 Advanced organic chemistry (6) May take either CHEM4443 or CHEM4441 to

fulfill this 12 credits requirement, but not both.

CHEM4443 Integrated organic synthesis (6) May take either CHEM4443 or CHEM4441 to

fulfill this 12 credits requirement, but not both.

CHEM4541 Physical chemistry III: statistical

thermodynamics and kinetics

theory (6)

Plus 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 and CHEM4966 Chemistry internship), subject to pre-requisite requirements.

# 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 ('must take') 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 ("must take") 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) 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 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 in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.
- 5. Courses at the advanced level and capstone requirements are subject to change.
- 6. 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.

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:

- (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)
- (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)
- (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)
- (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
- (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- (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
- (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)

# Science Foundation Courses (12 credits)

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

## **Disciplinary 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)

EASC4403 Biogeochemical cycles (6)

Plus at least 36 credits from Lists A and B, among which at least 12 credits from List A.

List A:

**EASC3415** 

EASC3410 Hydrogeology (6)

ENVS3313 Environmental oceanography (6)

Meteorology (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)

#### 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 ('must take') 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 ("must take") 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) 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 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 in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.
- 5. Courses at the advanced level and capstone requirements are subject to change.
- 6. 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

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 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:

- (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)
- (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)
- (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)
- (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
- (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- (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)
- (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)

# Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6)

SCNC1112 Fundamentals of modern science (6)

# **Disciplinary 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)

EASC4403 Biogeochemical cycles (6)

Plus 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)

#### 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 ('must take') 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 ("must take") 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) 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 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 in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.
- 5. Courses at the advanced level and capstone requirements are subject to change.
- 6. 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

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 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:

- (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)
- (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)
- (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)
- (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
- (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- (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)
- (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)

# Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6)

SCNC1112 Fundamentals of modern science (6)

# **Disciplinary 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)

EASC4403 Biogeochemical cycles (6)

Plus 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)

#### 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 ('must take') 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 ("must take") 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) 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 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 in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.
- 5. Courses at the advanced level and capstone requirements are subject to change.
- 6. 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

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 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:

- (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)
- (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)
- (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)
- (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)
- (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)
- (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)
- (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)

#### Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6)

SCNC1112 Fundamentals of modern science (6)

#### **Disciplinary 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)

BIOL3302 Systematics and phylogenetics (6)

BIOL3303 Conservation ecology (6)

Plus 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)

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)

#### **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 ('must take') 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 ("must take") 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) 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 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 in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.
- 5. Courses at the advanced level and capstone requirements are subject to change.

#### 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:

- (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)
- (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)
- (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)
- (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)
- (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)
- (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)
- (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)

#### Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6)

SCNC1112 Fundamentals of modern science (6)

#### **Disciplinary 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)

BIOL3302 Systematics and phylogenetics (6)

BIOL3303 Conservation ecology (6)

Plus 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)

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)

#### **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 ('must take') 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 ("must take") 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) 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 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 in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.
- 5. Courses at the advanced level and capstone requirements are subject to change.

#### 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:

- (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)
- (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)
- (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)
- (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)
- (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)
- (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)
- (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)

#### Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6)

SCNC1112 Fundamentals of modern science (6)

#### **Disciplinary 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)

BIOL3302 Systematics and phylogenetics (6)

BIOL3303 Conservation ecology (6)

Plus 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)

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)

Ecology & biodiversity project (12)

BIOL4911 Conservation science in practice (6)

#### Notes:

BIOL4991

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 ('must take') 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 ("must take") 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) 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 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 in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.
- 5. Courses at the advanced level and capstone requirements are subject to change.

## 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:

- (1) identify and describe different components of the environmental systems and key issues in environmental science
- (by means of lectures, coursework, tutorial classes and field/ laboratory/ team-based learning in the curriculum)
- (2) observe, describe, measure and analyze physical, biological and chemical characteristics of natural and manmade environments
- (by means of lectures, coursework, tutorial classes and field/ laboratory/ team-based learning in the curriculum)
- (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)
- (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)

## Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6)

SCNC1112 Fundamentals of modern science (6)

#### **Disciplinary Courses (36 credits)**

ENVS1401 Introduction to environmental science (6)

ENVS2001 Environmental field and lab course (6)

ENVS2002 Environmental data analysis (6)

Plus 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 36 credits requirement, but not both.

May take either STAT1601 or STAT1603 to fulfill this 36 credits requirement, but not

STAT1603 Introductory statistics (6)

BIOL2102 Biostatistics (6)

BIOL2306 Ecology and evolution (6)

CHEM2041 Principles of chemistry (6)

2. Advanced level courses (42 credits)

ENVS3004 Environment, society and economics (6)

Plus 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)

- 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 ('must take') 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 ("must take") 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) 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 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 in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.
- 5. Courses at the advanced level and capstone requirements are subject to change.

#### 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:

- (1) identify and describe different components of the environmental systems and key issues in environmental science
- (by means of lectures, coursework, tutorial classes and field/ laboratory/ team-based learning in the curriculum)
- (2) observe, describe, measure and analyze physical, biological and chemical characteristics of natural and manmade environments
- (by means of lectures, coursework, tutorial classes and field/ laboratory/ team-based learning in the curriculum)
- (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)
- (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)

## Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6)

SCNC1112 Fundamentals of modern science (6)

#### **Disciplinary Courses (36 credits)**

ENVS1401 Introduction to environmental science (6)

ENVS2001 Environmental field and lab course (6)

ENVS2002 Environmental data analysis (6)

Plus 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 36 credits requirement, but not both.

May take either STAT1601 or STAT1603 to fulfill this 36 credits requirement, but not

STAT1603 Introductory statistics (6)

BIOL2102 Biostatistics (6)

BIOL2306 Ecology and evolution (6)

CHEM2041 Principles of chemistry (6)

2. Advanced level courses (42 credits)

ENVS3004 Environment, society and economics (6)

Plus 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)

- 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 ('must take') 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 ("must take") 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) 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 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 in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.
- 5. Courses at the advanced level and capstone requirements are subject to change.

#### 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:

- (1) identify and describe different components of the environmental systems and key issues in environmental science
- (by means of lectures, coursework, tutorial classes and field/ laboratory/ team-based learning in the curriculum)
- (2) observe, describe, measure and analyze physical, biological and chemical characteristics of natural and manmade environments
- (by means of lectures, coursework, tutorial classes and field/ laboratory/ team-based learning in the curriculum)
- (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)
- (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)

## Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6)

SCNC1112 Fundamentals of modern science (6)

#### **Disciplinary Courses (36 credits)**

ENVS1401 Introduction to environmental science (6)

STAT1601 Elementary statistical methods (6)

May take either STAT1601 or STAT1603 to fulfill this 36 credits requirement, but not

both.

STAT1603 Introductory statistics (6)

May take either STAT1601 or STAT1603 to fulfill this 36 credits requirement, but not both

Plus at least 12 credits selected from the following courses (Level 1):

CHEM1042 General chemistry I (6)

EASC1020 Introduction to climate science (6)

EASC1401 Blue Planet (6)

ENVS1301 Environmental life science (6)

Plus at least 12 credits selected from the following courses (Level 2):

BIOL2102 Biostatistics (6)

BIOL2306 Ecology and evolution (6)

CHEM2041 Principles of 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)

ENVS3004 Environment, society and economics (6)

Plus 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)

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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 ('must take') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
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- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.
- 5. Courses at the advanced level and capstone requirements are subject to change.

#### 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:

- (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)
- (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)
- (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)
- (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)
- (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)
- (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)

## Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6)

SCNC1112 Fundamentals of modern science (6)

## **Disciplinary 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)

BIOL3201 Food chemistry (6)

BIOL3202 Nutritional biochemistry (6)

BIOL3203 Food microbiology (6)

Plus 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)

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 ('must take') 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 ("must take") 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) 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 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 in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.
- 5. Courses at the advanced level and capstone requirements are subject to change.
- 6. Students who wish to specialize in a certain area may choose to emphasize selection of courses from the following lists:
- (a) Food Science and Technology: 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.
- 7. Students who may wish to pursue postgraduate study in dietetics are strongly advised to consult their academic and course selection advisors regarding additional courses in Physiology and Biochemistry.

#### 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:

- (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)
- (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)
- (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)
- (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)
- (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)
- (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)

## Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6)

SCNC1112 Fundamentals of modern science (6)

## **Disciplinary 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)

BIOL3201 Food chemistry (6)

BIOL3202 Nutritional biochemistry (6)

BIOL3203 Food microbiology (6)

Plus 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)

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 ('must take') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.

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#### Remarks:

Major Title Major in 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.

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# Impermissible Combination:

Minor in Food & Nutritional Science

## Required courses (96 credits)

## 1. Introductory level courses (48 credits)

## Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6)

SCNC1112 Fundamentals of modern science (6)

## **Disciplinary Courses (36 credits)**

BIOL1110 From molecules to cells (6)

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## 2. Advanced level courses (42 credits)

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Plus at least 24 credits selected from the following courses:

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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)

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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)

BIOL4962 Food & nutritional science internship (6)

BIOL4992 Food & nutritional science project (12)

## Notes:

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- (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.
- 7. Students who may wish to pursue postgraduate study in dietetics are strongly advised to consult their academic and course selection advisors regarding additional courses in Physiology and Biochemistry.

#### Remarks:

Major Title Major in Geology

Offered to students

2014

admitted to Year 1 in

#### **Objectives:**

Geology concerns with the scientific study of the Earth's structure, processes, material and history. Geologists apply knowledge of chemistry, biology, physics and mathematics to solve Earth problems. The Geology Major aims to give students a sound foundation of the geological sciences and enable them to pursue postgraduate studies or careers in the geosciences. The curriculum emphasizes the development of knowledge and skills, and practical experience in the field. The core courses are designed to give students a well-rounded understanding of the geological disciplines including petrology, paleontology, geophysics, geochemistry, geochronology and the applications of geological knowledge to resource development, natural hazard management, and geotechnical and environmental engineering. Students who wish to become a professional geologist may take additional designated courses designed to meet the pathway for accreditation as a chartered geologist.

## **Learning Outcomes:**

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

- (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)
- (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)
- (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)
- (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)
- (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)

## Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6)

SCNC1112 Fundamentals of modern science (6)

#### **Disciplinary 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)

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) Plus 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) Advanced geochemistry and geochronology (6) **EASC3416 EASC3999** Directed studies in earth sciences (6) ENVS3007 Natural hazards and mitigation (6) Biogeochemical cycles (6) EASC4403 EASC4407 Regional geology (6) EASC4408 Special topics in earth sciences (6)

Earth sciences project (12)

3. Capstone requirement (6 credits)

**EASC4999** 

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 ('must take') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
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- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.
- 5. Courses at the advanced level and capstone requirements are subject to change.

#### Remarks:

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:

- (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)
- (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)
- (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)
- (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)
- (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)

## Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6)

SCNC1112 Fundamentals of modern science (6)

#### **Disciplinary 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)

EASC3402 Petrology (6)

EASC3403 Sedimentary environments (6)

EASC3404 Structural geology (6)

Geophysics (6) **EASC3409** Igneous and metamorphic petrogenesis (6) EASC4406 Earth Dynamics & Global Tectonics (6) Plus at least 12 credits selected from the following courses:

EASC3406 Reconstruction of past climate (6)

**EASC3410** Hydrogeology (6)

EASC3408

EASC3412 Earth resources (6)

**EASC3413** Engineering geology (6)

EASC3414 Soil and rock mechanics (6)

Advanced geochemistry and geochronology (6) **EASC3416** 

**EASC3999** Directed studies in earth sciences (6)

ENVS3007 Natural hazards and mitigation (6)

Biogeochemical cycles (6) EASC4403

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)

- 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 ('must take') by both majors. For cases with 24 or less doublecounted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
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- 5. Courses at the advanced level and capstone requirements are subject to change.

#### Remarks:

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:

- (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)
- (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
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#### Impermissible Combination:

Minor in Earth Sciences

## Required courses (96 credits)

#### 1. Introductory level courses (42 credits)

## Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6)

SCNC1112 Fundamentals of modern science (6)

#### **Disciplinary 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)

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)

Plus at least 12 credits selected from the following courses:

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**EASC3410** Hydrogeology (6)

EASC3412 Earth resources (6)

**EASC3413** Engineering geology (6)

EASC3414 Soil and rock mechanics (6)

Advanced geochemistry and geochronology (6) EASC3416

**EASC3999** Directed studies in earth sciences (6)

ENVS3007 Natural hazards and mitigation (6)

Biogeochemical cycles (6) EASC4403

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)

- 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 ('must take') by both majors. For cases with 24 or less doublecounted 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 ("must take") 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) 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 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 in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.
- 5. Courses at the advanced level and capstone requirements are subject to change.

#### 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:

- (1) describe and present fundamental concepts in mathematics
- (by means of coursework and learning activities in the major or minor curriculum)
- (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)
- (3) communicate in mathematical language and present scientific arguments
- (by means of coursework, seminars, guided studies and projects)
- (4) collaborate and work with other students in an effective manner
- (by means of guided studies, projects and seminars)
- (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)

# Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6)

SCNC1112 Fundamentals of modern science (6)

# **Disciplinary 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)

MATH3301 Algebra I (6)
MATH3401 Analysis I (6)

MATH3403 Functions of a complex variable (6)

Plus at least 24 credits advanced level Mathematics courses (MATH3XXX or MATH4XXX or MATH6XXX level), at least 12 credits of which should be from MATH4XXX or MATH6XXX level, excluding MATH4966 Mathematics internship, subject to pre-requisite requirements.

## 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 ('must take') 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 ("must take") 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) 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. Courses at the advanced level and capstone requirements are subject to change.
- 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.

#### Remarks:

Major Title Major in Mathematics

Offered to students

2013

admitted to Year 1 in

#### Objectives:

The Major in Mathematics provides students with a solid and comprehensive undergraduate education in the subject. It aims to nurture quantitative reasoning, logical, analytical and critical thinking, innovative imagination, meticulous care to work, ability to conceptualize, skills for problem-solving, and capability to tackle novel situations and ill-defined problems. Core courses in the curriculum emphasize fundamental knowledge and concepts in Mathematics and elective courses provide training in both pure and applied aspects of Mathematics. Throughout the curriculum there is also emphasis on experiential learning through guided studies, projects, seminars and summer internships. With the diversity of courses offered in the major, various specializations are available. These will lead to careers in a wide range of sectors including education, economics and finance, logistics, management, research and further studies.

# **Learning Outcomes:**

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

- (1) describe and present fundamental concepts in mathematics
- (by means of coursework and learning activities in the major or minor curriculum)
- (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)
- (3) communicate in mathematical language and present scientific arguments
- (by means of coursework, seminars, guided studies and projects)
- (4) collaborate and work with other students in an effective manner
- (by means of guided studies, projects and seminars)
- (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)

# **Science Foundation Courses (12 credits)**

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SCNC1112 Fundamentals of modern science (6)

# **Disciplinary 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)

MATH3301 Algebra I (6)
MATH3401 Analysis I (6)

MATH3403 Functions of a complex variable (6)

Plus at least 24 credits advanced level Mathematics courses (MATH3XXX or MATH4XXX or MATH6XXX level), at least 12 credits of which should be from MATH4XXX or MATH6XXX level, excluding MATH4966 Mathematics internship, subject to pre-requisite requirements.

## 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 ('must take') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
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- 4. Courses at the advanced level and capstone requirements are subject to change.
- 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.

#### Remarks:

Major Title Major in Mathematics

Offered to students

2012

admitted to Year 1 in

#### Objectives:

The Major in Mathematics provides students with a solid and comprehensive undergraduate education in the subject. It aims to nurture quantitative reasoning, logical, analytical and critical thinking, innovative imagination, meticulous care to work, ability to conceptualize, skills for problem-solving, and capability to tackle novel situations and ill-defined problems. Core courses in the curriculum emphasize fundamental knowledge and concepts in Mathematics and elective courses provide training in both pure and applied aspects of Mathematics. Throughout the curriculum there is also emphasis on experiential learning through guided studies, projects, seminars and summer internships. With the diversity of courses offered in the major, various specializations are available. These will lead to careers in a wide range of sectors including education, economics and finance, logistics, management, research and further studies.

# **Learning Outcomes:**

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

- (1) describe and present fundamental concepts in mathematics
- (by means of coursework and learning activities in the major or minor curriculum)
- (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)
- (3) communicate in mathematical language and present scientific arguments
- (by means of coursework, seminars, guided studies and projects)
- (4) collaborate and work with other students in an effective manner
- (by means of guided studies, projects and seminars)
- (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)

# **Science Foundation Courses (12 credits)**

SCNC1111 Scientific method and reasoning (6)

SCNC1112 Fundamentals of modern science (6)

# **Disciplinary 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)

MATH3301 Algebra I (6)
MATH3401 Analysis I (6)

MATH3403 Functions of a complex variable (6)

Plus at least 24 credits advanced level Mathematics courses (MATH3XXX or MATH4XXX or MATH6XXX level), at least 12 credits of which should be from MATH4XXX or MATH6XXX level, excluding MATH4966 Mathematics internship, subject to pre-requisite requirements.

## 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 ('must take') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
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- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Courses at the advanced level and capstone requirements are subject to change.
- 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.

#### 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:

- (1) identify and describe physical systems with a rigorous representation using their professional knowledge
- (by means of coursework and tutorial classes in the curriculum)
- (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)
- (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)
- (4) communicate and collaborate with people effectively in scientific issues
- (by means of group projects, tutorial sessions and presentation opportunities in the curriculum)
- (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)

# Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6)

SCNC1112 Fundamentals of modern science (6)

### **Disciplinary Courses (36 credits)**

MATH1013 University mathematics II (6)

PHYS1250 Fundamental physics (6)

MATH2101 Linear algebra I (6)

MATH2211 Multivariable calculus (6)

PHYS2250 Introductory mechanics (6)

PHYS2265 Modern physics (6)

## 2. Advanced level courses (42 credits)

MATH3301 Algebra I (6)

MATH3401 Analysis I (6)

PHYS3350 Classical mechanics (6)
PHYS3351 Quantum mechanics (6)

MATH4501 Geometry (6)

PHYS4351 Advanced quantum mechanics (6)

Plus at least 6 credits of advanced level Mathematics or Physics courses (MATH3XXX or MATH4XXX or MATH6XXX or PHYS4XXX or PHYS6XXX level), subject to prerequisite requirements.

# 3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:

MATH3999 Directed studies in mathematics (6)

PHYS3999 Directed studies in physics (6)

MATH4910 Senior Mathematics seminar (6)

MATH4911 Mathematics capstone project (6)

MATH4966 Mathematics internship (6)

MATH4999 Mathematics project (12)

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 ('must take') 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 ("must take") 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) 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 in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.
- 5. Courses at the advanced level and capstone requirements are subject to change.
- 6. (a) Students must have level 3 or above in HKDSE Physics or HKDSE Combined Science with Physics component or equivalent to take this major. Students who do not fufill this requirement are advised to take PHYS1240 Physics by inquiry; and
- (b) Students must have level 2 or above in HKDSE Extended Module 1 or 2 of Mathematics or equivalent to take this major. Students who do not fufill this requirement are advised to take MATH1011 University mathematics I.
- 7. 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:

Major Title Major in Mathematics/Physics

Offered to students

2013

admitted to Year 1 in

#### Objectives:

The Major in Mathematics/Physics aims to provide students with a solid foundation in both physics and mathematics. This major is catered especially for students interested in the more theoretical aspects of physics. It covers a wide range of core areas in both disciplines which form the blocks of fundamental knowledge for further specializations, e.g. quantum mechanics, statistical mechanics, classical mechanics, electrodynamics, linear algebra, mathematical analysis, abstract algebra, complex variables, differential equations, modern differential geometry, etc. A large selection of elective courses is provided for students to pursue a broad spectrum of professional knowledge in mathematical and theoretical physics. Analytical thinking, quantitative reasoning and innovative ideas are fostered through the effective design of courses and research projects. The curriculum emphasizes experiential learning through internships, field studies and research projects supervised by experts. With the comprehensive training received, graduates are expected to be well-prepared for further studies and to pursue careers in many fields of science and engineering.

### **Learning Outcomes:**

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

- (1) identify and describe physical systems with a rigorous representation using their professional knowledge
- (by means of coursework and tutorial classes in the curriculum)
- (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)
- (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)
- (4) communicate and collaborate with people effectively in scientific issues
- (by means of group projects, tutorial sessions and presentation opportunities in the curriculum)
- (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)

# Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6)

SCNC1112 Fundamentals of modern science (6)

### **Disciplinary Courses (36 credits)**

MATH1013 University mathematics II (6)

PHYS1250 Fundamental physics (6)

MATH2101 Linear algebra I (6)

MATH2211 Multivariable calculus (6)

PHYS2250 Introductory mechanics (6)

PHYS2265 Modern physics (6)

# 2. Advanced level courses (42 credits)

MATH3301 Algebra I (6)

MATH3401 Analysis I (6)

PHYS3350 Classical mechanics (6)
PHYS3351 Quantum mechanics (6)

MATH4501 Geometry (6)

PHYS4351 Advanced quantum mechanics (6)

Plus at least 6 credits of advanced level Mathematics or Physics courses (MATH3XXX or MATH4XXX or MATH6XXX or PHYS4XXX or PHYS6XXX level), subject to prerequisite requirements.

# 3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:

MATH3999 Directed studies in mathematics (6)

PHYS3999 Directed studies in physics (6)

MATH4910 Senior Mathematics seminar (6)

MATH4911 Mathematics capstone project (6)

MATH4966 Mathematics internship (6)

MATH4999 Mathematics project (12)

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 ('must take') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
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- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.
- 5. Courses at the advanced level and capstone requirements are subject to change.
- 6. (a) Students must have level 3 or above in HKDSE Physics or HKDSE Combined Science with Physics component or equivalent to take this major. Students who do not fufill this requirement are advised to take PHYS1240 Physics by inquiry; and
- (b) Students must have level 2 or above in HKDSE Extended Module 1 or 2 of Mathematics or equivalent to take this major. Students who do not fufill this requirement are advised to take MATH1011 University mathematics I.
- 7. 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:

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:

- (1) identify and describe physical systems with a rigorous representation using their professional knowledge
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- (4) communicate and collaborate with people effectively in scientific issues
- (by means of group projects, tutorial sessions and presentation opportunities in the curriculum)
- (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)

# Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6)

SCNC1112 Fundamentals of modern science (6)

### **Disciplinary Courses (36 credits)**

MATH1013 University mathematics II (6)

PHYS1250 Fundamental physics (6)

MATH2101 Linear algebra I (6)

MATH2211 Multivariable calculus (6)

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## 2. Advanced level courses (42 credits)

MATH3301 Algebra I (6)

MATH3401 Analysis I (6)

PHYS3350 Classical mechanics (6)
PHYS3351 Quantum mechanics (6)

MATH4501 Geometry (6)

PHYS4351 Advanced quantum mechanics (6)

Plus at least 6 credits of advanced level Mathematics or Physics courses (MATH3XXX or MATH4XXX or MATH6XXX or PHYS4XXX or PHYS6XXX level), subject to prerequisite requirements.

# 3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:

MATH3999 Directed studies in mathematics (6)

PHYS3999 Directed studies in physics (6)

MATH4910 Senior Mathematics seminar (6)

MATH4911 Mathematics capstone project (6)

MATH4966 Mathematics internship (6)

MATH4999 Mathematics project (12)

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 ('must take') 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 ("must take") 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) 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 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 in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.
- 5. Courses at the advanced level and capstone requirements are subject to change.
- 6. (a) Students must have level 3 or above in HKDSE Physics or HKDSE Combined Science with Physics component or equivalent to take this major. Students who do not fufill this requirement are advised to take PHYS1240 Physics by inquiry; and
- (b) Students must have level 2 or above in HKDSE Extended Module 1 or 2 of Mathematics or equivalent to take this major. Students who do not fufill this requirement are advised to take MATH1011 University mathematics I.
- 7. 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:

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:

- (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)
- (2) apply laboratory techniques essential to modern molecular science
- (by means of coursework and laboratory-based and/or research-based opportunities in the curriculum)
- (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)
- (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)
- (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)

## Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6)

SCNC1112 Fundamentals of modern science (6)

#### **Disciplinary Courses (30 credits)**

BIOL1110 From molecules to cells (6)

BIOL2220 Principles of biochemistry (6)

May take either BIOL2220 or BIOC2600 to fulfill this 30 credits requirement, but not

both.

BIOC2600 Basic biochemistry (6)

May take either BIOL2220 or BIOC2600 to fulfill this 30 credits requirement, but not

both.

BIOL2102 Biostatistics (6)

BIOL2103 Biological sciences laboratory course (6)

BIOL2306 Ecology and evolution (6)

# 2. Advanced level courses (48 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)

Plus 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 ('must take') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.

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- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.

5. Courses at the advanced level and capstone requirements are subject to change.

# 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:

- (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)
- (2) apply laboratory techniques essential to modern molecular science
- (by means of coursework and laboratory-based and/or research-based opportunities in the curriculum)
- (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)
- (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)
- (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	1. I	ntroductory	/ level co	ourses (42	credits
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### Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6)

SCNC1112 Fundamentals of modern science (6)

#### **Disciplinary Courses (30 credits)**

BIOL1110 From molecules to cells (6)

BIOL2220 Principles of biochemistry (6) May take either BIOL2220 or

BIOC2600 to fulfill this 30 credits requirement, but not

both.

BIOC2600 Basic biochemistry (6)

May take either BIOL2220 or BIOC2600 to fulfill this 30 credits requirement, but not

both.

BIOL2102 Biostatistics (6)

BIOL2103 Biological sciences laboratory course (6)

BIOL2306 Ecology and evolution (6)

# 2. Advanced level courses (48 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)

Plus 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 ('must take') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.

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- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.

5. Courses at the advanced level and capstone requirements are subject to change.

# 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:

- (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)
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- (by means of coursework and laboratory-based and/or research-based opportunities in the curriculum)
- (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	1. I	ntroductory	/ level co	ourses (42	credits
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### Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6)

SCNC1112 Fundamentals of modern science (6)

#### **Disciplinary Courses (30 credits)**

BIOL1110 From molecules to cells (6)

BIOL2220 Principles of biochemistry (6) May take either BIOL2220 or BIOC2600 to fulfill this 30

credits requirement, but not

both.

BIOC2600 Basic biochemistry (6)

May take either BIOL2220 or BIOC2600 to fulfill this 30 credits requirement, but not

both.

BIOL2102 Biostatistics (6)

BIOL2103 Biological sciences laboratory course (6)

BIOL2306 Ecology and evolution (6)

# 2. Advanced level courses (48 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)

Plus 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 ('must take') 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 ("must take") 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) 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 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 in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.

5. Courses at the advanced level and capstone requirements are subject to change.

# Remarks:

Major Title Major in Physics

Offered to students admitted to Year 1 in

#### **Objectives:**

The Major in Physics aims to provide students with a solid foundation on the subject. Core courses form the blocks of fundamental knowledge to pursue learning in specializations, e.g. quantum mechanics, statistical mechanics, classical mechanics and electrodynamics. A large selection of elective courses is provided for students to pursue a wide range of topics from the very small scale (i.e. subatomic particles) to the large scale (i.e. cosmology). Students will attain professional knowledge in physics, research experience and the training of analytical thinking and quantitative reasoning during their studies. Graduates are expected to have acquired the broad training which can equip them well for further studies in multiple science and technology disciplines and to work in their specialized area.

### **Learning Outcomes:**

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

(1) identify and describe physical systems with their professional knowledge

2014

- (by means of coursework and tutorial classes in the curriculum)
- (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)
- (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)
- (4) communicate and collaborate with people effectively in scientific issues
- (by means of group projects, tutorial sessions and presentation opportunities in the curriculum)
- (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)

### Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6)

SCNC1112 Fundamentals of modern science (6)

# **Disciplinary 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)

PHYS3350 Classical mechanics (6)

PHYS3351 Quantum mechanics (6)

PHYS3450 Electromagnetism (6)

PHYS3550 Statistical mechanics & thermodynamics (6)

Plus at least 18 credits of advanced level Physics courses (PHYS3XXX or PHYS4XXX or PHYS6XXX level), subject to prerequisite requirements.

## 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 ('must take') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
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- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.
- 5. Courses at the advanced level and capstone requirements are subject to change.
- 6. Students must have level 3 or above in HKDSE Physics or equivalent to take this major. Students who do not fulfill this requirement are advised to take PHYS1240 Physics by inquiry.

#### Remarks:

Major Title Major in Physics

Offered to students

2013

admitted to Year 1 in

#### **Objectives:**

The Major in Physics aims to provide students with a solid foundation on the subject. Core courses form the blocks of fundamental knowledge to pursue learning in specializations, e.g. quantum mechanics, statistical mechanics, classical mechanics and electrodynamics. A large selection of elective courses is provided for students to pursue a wide range of topics from the very small scale (i.e. subatomic particles) to the large scale (i.e. cosmology). Students will attain professional knowledge in physics, research experience and the training of analytical thinking and quantitative reasoning during their studies. Graduates are expected to have acquired the broad training which can equip them well for further studies in multiple science and technology disciplines and to work in their specialized area.

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#### Impermissible Combination:

Major in Mathematics/Physics

Minor in Physics

# Required courses (96 credits)

# 1. Introductory level courses (48 credits)

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SCNC1111 Scientific method and reasoning (6)

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## 2. Advanced level courses (42 credits)

PHYS3350 Classical mechanics (6)

PHYS3351 Quantum mechanics (6)

PHYS3450 Electromagnetism (6)

PHYS3550 Statistical mechanics & thermodynamics (6)

Plus at least 18 credits of advanced level Physics courses (PHYS3XXX or PHYS4XXX or PHYS6XXX level), subject to prerequisite requirements.

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At least 6 credits selected from the following courses:

PHYS3999 Directed studies in physics (6)

PHYS4966 Physics internship (6)

PHYS4999 Physics project (12)

#### Notes:

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#### Remarks:

Major Title Major in Physics

Offered to students

admitted to Year 1 in

2012

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#### Impermissible Combination:

Major in Mathematics/Physics

Minor in Physics

# Required courses (96 credits)

## 1. Introductory level courses (48 credits)

### Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6)

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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 ('must take') 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 ("must take") 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) 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 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 in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.
- 5. Courses at the advanced level and capstone requirements are subject to change.
- 6. Students must have level 3 or above in HKDSE Physics or equivalent to take this major. Students who do not fulfill this requirement are advised to take PHYS1240 Physics by inquiry.

#### Remarks

Major Title Major in 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:

- (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)
- (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)
- (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)
- (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)
- (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)
- (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 Statistics

Minor in Risk Management

Minor in Statistics

# Required courses (96 credits)

# 1. Introductory level courses (42 credits)

# 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)

STAT3600 Linear statistical analysis (6)

STAT3609 The statistics of investment risk (6)

STAT3615 Practical mathematics for investment (6)

STAT4601 Time-series analysis (6)

Plus 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 ('must take') 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 ("must take") 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) 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 in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Courses at the advanced level and capstone requirements are subject to change.
- 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.

#### 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 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:

- (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)
- (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)
- (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)
- (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)
- (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)
- (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 Statistics

Minor in Risk Management

Minor in Statistics

# Required courses (96 credits)

# 1. Introductory level courses (42 credits)

# 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)

STAT2601 Probability and statistics I (6)

STAT2602 Probability and statistics II (6)

STAT2603 Data management with SAS (6)

# 2. Advanced level courses (48 credits)

STAT3600 Linear statistical analysis (6)

STAT3609 The statistics of investment risk (6)

STAT3615 Practical mathematics for investment (6)

STAT4601 Time-series analysis (6)

Plus 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 ('must take') 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 ("must take") 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) 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 in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Courses at the advanced level and capstone requirements are subject to change.
- 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.

#### 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 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:

- (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)
- (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)
- (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)
- (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)
- (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)
- (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 Statistics

Minor in Risk Management

Minor in Statistics

# Required courses (96 credits)

# 1. Introductory level courses (42 credits)

# 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)

STAT2601 Probability and statistics I (6)

STAT2602 Probability and statistics II (6)

STAT2603 Data management with SAS (6)

# 2. Advanced level courses (48 credits)

STAT3600 Linear statistical analysis (6)

STAT3609 The statistics of investment risk (6)

STAT3615 Practical mathematics for investment (6)

STAT4601 Time-series analysis (6)

Plus 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 ('must take') 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 ("must take") 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) 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 in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Courses at the advanced level and capstone requirements are subject to change.
- 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.

#### 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 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:

- (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)
- (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)
- (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)
- (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)
- (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)
- (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 Risk Management

Minor in Risk Management

Minor in Statistics

#### Required courses (96 credits)

# 1. Introductory level courses (42 credits)

# **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)

STAT3600 Linear statistical analysis (6)

STAT3603 Probability modelling (6)

STAT4601 Time-series analysis (6)

STAT4602 Multivariate data analysis (6)

Plus 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 ('must take') 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 ("must take") 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) 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 in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 5. Courses at the advanced level and capstone requirements are subject to change.
- 6. 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.
- 7. 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:

Major Title Major in Statistics

2013

Offered to students admitted to Year 1 in

#### Objectives:

The Major in Statistics focuses on the study of statistics, a scientific discipline characterized by the development and applications of analytical and quantitative tools which involve logical thinking, problem formulation, probability reasoning and intensive data analyses. The programme aims to equip students with powerful mathematical, analytical and computational skills, which are in great demand in practical areas where data are obtained for the purpose of extracting information in support of decision making. It gives students a strong background in statistical concepts, and provides broad and solid training in applied statistical methodologies. The curriculum is constantly revised to meet a steadily rising demand for specialist statisticians or quantitative analysts in government, business, finance, industry, as well as in research and teaching in local and overseas institutions.

# **Learning Outcomes:**

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

- (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)
- (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)
- (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)
- (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)
- (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)
- (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 Risk Management

Minor in Risk Management

Minor in Statistics

#### Required courses (96 credits)

# 1. Introductory level courses (42 credits)

# 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)

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

STAT2603 Data management with SAS (6)

# 2. Advanced level courses (48 credits)

STAT3600 Linear statistical analysis (6) STAT3603 Probability modelling (6)

STAT4601 Time-series analysis (6)

STAT4602 Multivariate data analysis (6)

Plus 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 ('must take') 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 ("must take") 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) 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 in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 5. Courses at the advanced level and capstone requirements are subject to change.
- 6. 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.
- 7. 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:

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:

- (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)
- (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)
- (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)
- (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)
- (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)
- (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 Risk Management

Minor in Risk Management

Minor in Statistics

#### Required courses (96 credits)

# 1. Introductory level courses (42 credits)

# **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)

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

STAT2603 Data management with SAS (6)

# 2. Advanced level courses (48 credits)

STAT3600 Linear statistical analysis (6)

STAT3603 Probability modelling (6)

STAT4601 Time-series analysis (6)

STAT4602 Multivariate data analysis (6)

Plus 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 ('must take') 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 ("must take") 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) 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 in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 5. Courses at the advanced level and capstone requirements are subject to change.
- 6. 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.
- 7. 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:

Science Minors on offer in 2014-15

# SCIENCE

# SECTION VII Science Minors on offer in 2014/15

# 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

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:

- (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)
- (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:

FINA1310

Bachelor of Science in Actuarial Science

# Required courses (42 credits)

# 1. Introductory level courses (12 credits)

At least 12 credits selected from the following courses:

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)

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:

<sup>1.</sup> Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("must take") 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. Courses at the advanced level are subject to change.

#### 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:

- (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)
- (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)

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)

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:

<sup>1.</sup> Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("must take") 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. Courses at the advanced level are subject to change.

#### 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:

- (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)
- (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:

FINA1310

Bachelor of Science in Actuarial Science

# Required courses (42 credits)

# 1. Introductory level courses (12 credits)

At least 12 credits selected from the following courses:

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)

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 ("must take") 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. Courses at the advanced level are subject to change.

#### 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:

- (1) identify and describe astrophysical phenomena with fundamental knowledge in physics
- (by means of coursework and tutorial classes in the curriculum)
- (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)
- (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)

PHYS1250 Fundamental physics (6)

PHYS1650 Nature of the universe (6)

PHYS2265 Modern physics (6)

# 2. Advanced level courses (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)

PHYS6650

#### Notes:

- 1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("must take") 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. Courses at the advanced level are subject to change.

3. Students must have level 3 or above in HKDSE Physics or equivalent to take this major. Students who do not fulfill this requirement are advised to take PHYS1240 Physics by inquiry.

# 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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Major in Astronomy

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PHYS3652 Principles of astronomy (6)

PHYS4650 Stellar physics (6)

PHYS4651 Selected topics in astrophysics (6)

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PHYS4653 Cosmology (6)

PHYS4654 General relativity (6)

PHYS4655 Interstellar medium (6)

PHYS6650

#### Notes:

- 1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("must take") 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. Courses at the advanced level are subject to change.

3. Students must have level 3 or above in HKDSE Physics or equivalent to take this major. Students who do not fulfill this requirement are advised to take PHYS1240 Physics by inquiry.

# 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:

- (1) identify and describe astrophysical phenomena with fundamental knowledge in physics
- (by means of coursework and tutorial classes in the curriculum)
- (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)
- (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)

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PHYS3652 Principles of astronomy (6)

PHYS4650 Stellar physics (6)

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PHYS4652 Planetary science (6)

PHYS4653 Cosmology (6)

PHYS4654 General relativity (6)

PHYS4655 Interstellar medium (6)

PHYS6650

#### Notes

- 1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("must take") 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. Courses at the advanced level are subject to change.

3. Students must have level 3 or above in HKDSE Physics or equivalent to take this major. Students who do not fulfill this requirement are advised to take PHYS1240 Physics by inquiry.

# 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:

- (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)
- (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)
- (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)

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)

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 ("must take") 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. Courses at the advanced level are subject to change.

# 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:

- (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)
- (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)
- (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)

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)

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 ("must take") 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. Courses at the advanced level are subject to change.

# 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:

- (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)
- (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)
- (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)

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)

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 ("must take") 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. Courses at the advanced level are subject to change.

# 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:

- (1) understand and apply the basic concepts of chemistry
- (by means of coursework and laboratory-based learning in the curriculum)
- (2) apply chemistry concepts in other subjects
- (by means of coursework and laboratory-based learning in the curriculum)
- (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)

CHEM1042 General chemistry I (6)

Plus 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 CHEM2441 and CHEM2442 Organic chemistry I (6)

are mutually exclusive.

CHEM2442 Fundamentals of organic chemistry (6) CHEM2441 and CHEM2442 are mutually exclusive.

CHEM2541 Introductory Physical Chemistry (6)

# 2. Advanced level courses (24 credits)

At least 24 credits of advanced level Chemistry courses (CHEM3XXX or CHEM4XXX level), subject to prerequisite requirements.

- 1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("must take") 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. Courses at the advanced level are subject to change.
- 3. 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:

- (1) understand and apply the basic concepts of chemistry
- (by means of coursework and laboratory-based learning in the curriculum)
- (2) apply chemistry concepts in other subjects
- (by means of coursework and laboratory-based learning in the curriculum)
- (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)

CHEM1042 General chemistry I (6)

Plus 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 (24 credits)

At least 24 credits of advanced level Chemistry courses (CHEM3XXX or CHEM4XXX level), subject to prerequisite requirements.

#### Notes

- 1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("must take") 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. Courses at the advanced level are subject to change.
- 3. 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:

- (1) understand and apply the basic concepts of chemistry
- (by means of coursework and laboratory-based learning in the curriculum)
- (2) apply chemistry concepts in other subjects
- (by means of coursework and laboratory-based learning in the curriculum)
- (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)

CHEM1042 General chemistry I (6)

Plus 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 (24 credits)

At least 24 credits of advanced level Chemistry courses (CHEM3XXX or CHEM4XXX level), subject to prerequisite requirements.

#### Notes

- 1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("must take") 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. Courses at the advanced level are subject to change.
- 3. 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

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.

#### **Learning Outcomes:**

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

- (1) understand and describe fundamental concepts in computational and financial mathematics
- (by means of coursework, tutorial classes and project-based learning in the curriculum)
- (2) apply mathematical methods and analysis to real life problems
- (by means of coursework, tutorial classes and project-based learning in the curriculum)
- (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 4)

MATH1013 University mathematics II (6)

MATH2101 Linear algebra I (6)

MATH2211 Multivariable calculus (6)

# 2. Advanced level courses (24 credits)

MATH3601 Numerical analysis (6)
MATH3906 Financial calculus (6)

Plus 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 ("must take") 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. Courses at the advanced level are subject to change.
- 3. 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.

- 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 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.
- 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 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.

#### **Learning Outcomes:**

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

- (1) understand and describe fundamental concepts in computational and financial mathematics
- (by means of coursework, tutorial classes and project-based learning in the curriculum)
- (2) apply mathematical methods and analysis to real life problems
- (by means of coursework, tutorial classes and project-based learning in the curriculum)
- (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 4)

MATH1013 University mathematics II (6)

MATH2101 Linear algebra I (6)

MATH2211 Multivariable calculus (6)

# 2. Advanced level courses (24 credits)

MATH3601 Numerical analysis (6)
MATH3906 Financial calculus (6)

Plus 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 ("must take") 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. Courses at the advanced level are subject to change.
- 3. 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.

- 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 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.
- 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 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:

- (1) understand and describe fundamental concepts in computational and financial mathematics
- (by means of coursework, tutorial classes and project-based learning in the curriculum)
- (2) apply mathematical methods and analysis to real life problems
- (by means of coursework, tutorial classes and project-based learning in the curriculum)
- (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 4)

MATH1013 University mathematics II (6)

MATH2101 Linear algebra I (6)

MATH2211 Multivariable calculus (6)

# 2. Advanced level courses (24 credits)

MATH3601 Numerical analysis (6)
MATH3906 Financial calculus (6)

Plus 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 ("must take") 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. Courses at the advanced level are subject to change.
- 3. 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.

- 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 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.
- 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 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:

- (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)
- (2) understand and describe the basic nomenclature used in Earth Sciences
- (by means to coursework, tutorial classes and field-based learning in the curriculum)
- (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)

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)

At least 24 credits of advanced level Earth Sciences courses (EASC3XXX or EASC4XXX level), subject to prerequisite requirements.

#### Notes:

- 1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("must take") 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. Courses at the advanced level are subject to change.

## 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:

- (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)
- (2) understand and describe the basic nomenclature used in Earth Sciences
- (by means to coursework, tutorial classes and field-based learning in the curriculum)
- (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)

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)

At least 24 credits of advanced level Earth Sciences courses (EASC3XXX or EASC4XXX level), subject to prerequisite requirements.

#### Notes:

- 1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("must take") 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. Courses at the advanced level are subject to change.

## Remarks:

Minor Title Minor in Earth Sciences

Offered to students

2012

admitted to Year 1 in

## Objectives:

The Minor in Earth Sciences aims to provide interested students with an introduction to the fundamental structure, process and history of the Earth. The minor curriculum is designed particularly to provide students from different majors the flexibility to select courses to enhance their interests in Earth Sciences or to complement their major of study.

# **Learning Outcomes:**

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

- (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)
- (2) understand and describe the basic nomenclature used in Earth Sciences
- (by means to coursework, tutorial classes and field-based learning in the curriculum)
- (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)

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)

At least 24 credits of advanced level Earth Sciences courses (EASC3XXX or EASC4XXX level), subject to prerequisite requirements.

#### Notes:

- 1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("must take") 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. Courses at the advanced level are subject to change.

## 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:

- (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)
- (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)
- (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)

Required courses (36 credits)			
1. Introductory level courses (12 credits)			
BIOL1309	Evolutionary diversity (6)		
BIOL2306	Ecology and evolution (6)		
2. Advanced lev	2. Advanced level courses (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)		
BIOL4301	Fish and fisheries (6)		
BIOL4302	Environmental impact assessment (6)		
BIOL4303	Animal behaviour (6)		

#### Notes:

<sup>1.</sup> Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("must take") 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. Courses at the advanced level are subject to change.

#### 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:

- (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)
- (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)
- (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)	
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•				
1. Introductory level courses (12 credits)				
BIOL1309	Evolutionary diversity (6)			
BIOL2306	Ecology and evolution (6)			
2. Advanced lev	vel courses (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)			
BIOL4301	Fish and fisheries (6)			
BIOL4302	Environmental impact assessment (6)			
BIOL4303	Animal behaviour (6)			

#### Notes:

<sup>1.</sup> Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("must take") 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. Courses at the advanced level are subject to change.

#### 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:

- (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)
- (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)
- (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 credit	s)
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1. Introductory level courses (12 credits)

BIOL1309	Evolutionary diversity (6)
BIOL2306	Ecology and evolution (6)
2. Advanced level	I courses (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)
BIOL4301	Fish and fisheries (6)

Environmental impact assessment (6)

Animal behaviour (6)

#### Notes:

BIOL4302

BIOL4303

1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("must take") 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. Courses at the advanced level are subject to change.

#### 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:

- (1) identify and describe different components of the environmental systems and key issues in environmental science
- (by means of lectures, coursework, tutorial classes and field/ laboratory/ team-based learning in the curriculum)
- (2) observe, describe, measure and analyze physical, biological and chemical characteristics of natural and manmade environments
- (by means of lectures, coursework, tutorial classes and field/ laboratory/ team-based learning in the curriculum)
- (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)
- (4) gain skills in scientific inquiry and effective communication of global environmental problems, issues of resource management, policies and management methods

(by means of field/ laboratory/ team-based learning, research projects, presentation opportunities and capstone experiences in the curriculum)

## Impermissible Combination:

Major in Environmental Science

## Required courses (42 credits)

## 1. Introductory level courses (18 credits)

ENVS1401 Introduction to environmental science (6)

Plus at least 12 credits selected from the following courses (Level 1 & 2):

CHEM1042 General chemistry I (6)

CHEM2041 Principles of 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)

ENVS3004 Environment, society and economics (6)

Plus 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	NVS3313 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 ("must take") 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. Courses at the advanced level are subject to change.

# 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:

- (1) identify and describe different components of the environmental systems and key issues in environmental science
- (by means of lectures, coursework, tutorial classes and field/ laboratory/ team-based learning in the curriculum)
- (2) observe, describe, measure and analyze physical, biological and chemical characteristics of natural and manmade environments
- (by means of lectures, coursework, tutorial classes and field/ laboratory/ team-based learning in the curriculum)
- (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)
- (4) gain skills in scientific inquiry and effective communication of global environmental problems, issues of resource management, policies and management methods

(by means of field/ laboratory/ team-based learning, research projects, presentation opportunities and capstone experiences in the curriculum)

## Impermissible Combination:

Major in Environmental Science

## Required courses (42 credits)

## 1. Introductory level courses (18 credits)

ENVS1401 Introduction to environmental science (6)

Plus at least 12 credits selected from the following courses (Level 1 & 2):

CHEM1042 General chemistry I (6)

CHEM2041 Principles of 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)

ENVS3004 Environment, society and economics (6)

Plus 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	3313 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 ("must take") 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. Courses at the advanced level are subject to change.

# 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:

- (1) identify and describe different components of the environmental systems and key issues in environmental science
- (by means of lectures, coursework, tutorial classes and field/ laboratory/ team-based learning in the curriculum)
- (2) observe, describe, measure and analyze physical, biological and chemical characteristics of natural and manmade environments
- (by means of lectures, coursework, tutorial classes and field/ laboratory/ team-based learning in the curriculum)
- (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)
- (4) gain skills in scientific inquiry and effective communication of global environmental problems, issues of resource management, policies and management methods

(by means of field/ laboratory/ team-based learning, research projects, presentation opportunities and capstone experiences in the curriculum)

## Impermissible Combination:

Major in Environmental Science

## Required courses (42 credits)

## 1. Introductory level courses (18 credits)

ENVS1401 Introduction to environmental science (6)

Plus at least 6 credits selected from the following courses (Level 1):

CHEM1042 General chemistry I (6)

EASC1401 Blue Planet (6)

ENVS1301 Environmental life science (6)

Plus at least 6 credits selected from the following courses (Level 2):

BIOL2102 Biostatistics (6)

CHEM2041 Principles of 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)

ENVS3004 Environment, society and economics (6)

Plus at least 18 credits selected from the following courses:

BIOL3110 Environmental toxicology (6)

BIOL3303 Conservation ecology (6)

BIOL4302 Environmental impact assessment (6)

III				
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 ("must take") 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. Courses at the advanced level are subject to change.

# 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:

- (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)
- (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)
- (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)
- (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)

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)

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)

BIOL3210 Grain production and utilization (6)

BIOL3211 Nutrigenomics (6)

BIOL4201 Public health nutrition (6)

BIOL4204 Diet, brain function and behavior (6)

ВІС	DL4205	Food processing and engineering (6)
ВІС	DL4207	Meat and dairy sciences (6)
BIC	DL4209	Functional foods (6)
ВІС	DL4210	Food product development (6)
ВІС	DL4411	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 ("must take") 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. Courses at the advanced level are subject to change.

#### 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:

- (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)
- (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)
- (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)
- (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)

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)

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)

BIOL3210 Grain production and utilization (6)

BIOL3211 Nutrigenomics (6)

BIOL4201 Public health nutrition (6)

BIOL4204 Diet, brain function and behavior (6)

ВІС	DL4205	Food processing and engineering (6)
ВІС	DL4207	Meat and dairy sciences (6)
BIC	DL4209	Functional foods (6)
ВІС	DL4210	Food product development (6)
ВІС	DL4411	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 ("must take") 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. Courses at the advanced level are subject to change.

#### 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:

- (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)
- (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)
- (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)
- (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)

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)

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)

BIOL3210 Grain production and utilization (6)

BIOL3211 Nutrigenomics (6)

BIOL4201 Public health nutrition (6)

BIOL4204 Diet, brain function and behavior (6)

BIOL420	Food processing and en	gineering (6)
BIOL420	Meat and dairy sciences	s (6)
BIOL420	9 Functional foods (6)	
BIOL421	Food product developme	ent (6)
BIOL441	1 Plant and food biotechno	ology (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 ("must take") 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. Courses at the advanced level are subject to change.

#### Remarks:

Minor Title Minor in Marine Biology

Offered to students admitted to Year 1 in

2014

# 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:

- (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)
- (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)
- (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)
- (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)
- (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)

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)

BIOL3301 Marine biology (6)

ENVS3313 Environmental oceanography (6)

Plus 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)

#### Notes:

1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course

appears as a core course ("must take") 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. Courses at the advanced level are subject to change.

#### 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.

## **Learning Outcomes:**

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

- (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)
- (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)
- (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)
- (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)
- (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)

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)

BIOL3301 Marine biology (6)

ENVS3313 Environmental oceanography (6)

Plus 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)

## Notes:

1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course

appears as a core course ("must take") 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. Courses at the advanced level are subject to change.

#### 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.

## **Learning Outcomes:**

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

- (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)
- (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)
- (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)
- (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)
- (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)

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)

BIOL3301 Marine biology (6)

ENVS3313 Environmental oceanography (6)

Plus 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)

#### Notes

1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course

appears as a core course ("must take") 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. Courses at the advanced level are subject to change.

#### Remarks:

Minor Title Minor in Mathematics

Offered to students 2014

admitted to Year 1 in

# Objectives:

The Minor in Mathematics provides students with fundamental knowledge in the subject. It is specifically designed for students who are interested in the subject and those whose majors require sophisticated mathematical skills. It aims to nurture quantitative reasoning, logical, analytical and critical thinking, innovative imagination, meticulous care to work, ability to conceptualize, skills for problem-solving, and capability to tackle novel situations and ill-defined problems.

## **Learning Outcomes:**

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

- (1) understand and describe fundamental concepts of mathematics
- (by means of coursework, tutorial classes and project-based learning in the curriculum)
- (2) apply mathematical methods and analysis to real life problems
- (by means of coursework, tutorial classes and project-based learning in the curriculum)
- (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 5)

MATH1013 University mathematics II (6)

MATH2101 Linear algebra I (6)

MATH2211 Multivariable calculus (6)

## 2. Advanced level courses (18 credits)

At least 18 credits of advanced level Mathematics courses (MATH3XXX or MATH4XXX or MATH6XXX level), subject to pre-requisite requirements.

## Notes:

- 1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("must take") 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. Courses at the advanced level are subject to change.
- 3. 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.
- 4. 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.
- 5. 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.
- 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.

Minor Title Minor in Mathematics

Offered to students

admitted to Year 1 in

## **Objectives:**

The Minor in Mathematics provides students with fundamental knowledge in the subject. It is specifically designed for students who are interested in the subject and those whose majors require sophisticated mathematical skills. It aims to nurture quantitative reasoning, logical, analytical and critical thinking, innovative imagination, meticulous care to work, ability to conceptualize, skills for problem-solving, and capability to tackle novel situations and illdefined problems.

## Learning Outcomes:

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

(1) understand and describe fundamental concepts of mathematics

2013

- (by means of coursework, tutorial classes and project-based learning in the curriculum)
- (2) apply mathematical methods and analysis to real life problems
- (by means of coursework, tutorial classes and project-based learning in the curriculum)
- (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 5)

MATH1013 University mathematics II (6)

MATH2101 Linear algebra I (6)

MATH2211 Multivariable calculus (6)

## 2. Advanced level courses (18 credits)

At least 18 credits of advanced level Mathematics courses (MATH3XXX or MATH4XXX or MATH6XXX level), subject to pre-requisite requirements.

## Notes:

- 1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("must take") 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. Courses at the advanced level are subject to change.
- 3. 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.
- 4. 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.
- 5. 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.
- 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.

Minor Title Minor in Mathematics

Offered to students 2

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:

- (1) understand and describe fundamental concepts of mathematics
- (by means of coursework, tutorial classes and project-based learning in the curriculum)
- (2) apply mathematical methods and analysis to real life problems
- (by means of coursework, tutorial classes and project-based learning in the curriculum)
- (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 5)

MATH1013 University mathematics II (6)

MATH2101 Linear algebra I (6)

MATH2211 Multivariable calculus (6)

## 2. Advanced level courses (18 credits)

At least 18 credits of advanced level Mathematics courses (MATH3XXX or MATH4XXX or MATH6XXX level), subject to pre-requisite requirements.

## Notes:

- 1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("must take") 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. Courses at the advanced level are subject to change.
- 3. 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.
- 4. 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.
- 5. 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.
- 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.

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.

### **Learning Outcomes:**

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

- (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)
- (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)
- (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

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)

BIOL3401 Molecular biology (6)

Plus 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)

### Notes:

- 1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("must take") 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. Courses at the advanced level are subject to change.

### 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:

- (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)
- (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)
- (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)

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)

BIOL3401 Molecular biology (6)

Plus 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)

### Notes:

- 1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("must take") 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. Courses at the advanced level are subject to change.

### 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:

- (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)
- (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)
- (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)

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)

BIOL3401 Molecular biology (6)

Plus 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)

### Notes

- 1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("must take") 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. Courses at the advanced level are subject to change.

### Remarks:

Minor Title Minor in Physics

Offered to students 2014

admitted to Year 1 in

### Objectives:

The Minor in Physics is intended to provide interested students with a fundamental outlook on the subject. Students would acquire a taste of the subject through a large selection of elective courses which provides them to pursue a wide range of topics from the very small scale of nanomaterials to the large scale of astrophysics.

### **Learning Outcomes:**

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

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

PHYS1250 Fundamental physics (6)

PHYS2250 Introductory mechanics (6)

PHYS2265 Modern physics (6)

### 2. Advanced level courses (24 credits)

At least 24 credits of advanced level Physics courses (PHYS3XXX or PHYS4XXX or PHYS6XXX level), subject to prerequisite requirements.

### **Notes**

- 1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("must take") 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. Courses at the advanced level are subject to change.
- 3. Students must have level 3 or above in HKDSE Physics or equivalent to take this major. Students who do not fulfill this requirement are advised to take PHYS1240 Physics by inquiry.

### Remarks:

Minor Title Minor in Physics

Offered to students 2013

admitted to Year 1 in

### **Objectives:**

The Minor in Physics is intended to provide interested students with a fundamental outlook on the subject. Students would acquire a taste of the subject through a large selection of elective courses which provides them to pursue a wide range of topics from the very small scale of nanomaterials to the large scale of astrophysics.

### **Learning Outcomes:**

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

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

PHYS1250 Fundamental physics (6)

PHYS2250 Introductory mechanics (6)

PHYS2265 Modern physics (6)

### 2. Advanced level courses (24 credits)

At least 24 credits of advanced level Physics courses (PHYS3XXX or PHYS4XXX or PHYS6XXX level), subject to prerequisite requirements.

### **Notes**

- 1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("must take") 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. Courses at the advanced level are subject to change.
- 3. Students must have level 3 or above in HKDSE Physics or equivalent to take this major. Students who do not fulfill this requirement are advised to take PHYS1240 Physics by inquiry.

### Remarks:

Minor Title Minor in Physics

Offered to students 2012

admitted to Year 1 in

### Objectives:

The Minor in Physics is intended to provide interested students with a fundamental outlook on the subject. Students would acquire a taste of the subject through a large selection of elective courses which provides them to pursue a wide range of topics from the very small scale of nanomaterials to the large scale of astrophysics.

### **Learning Outcomes:**

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

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

PHYS1250 Fundamental physics (6)

PHYS2250 Introductory mechanics (6)

PHYS2265 Modern physics (6)

### 2. Advanced level courses (24 credits)

At least 24 credits of advanced level Physics courses (PHYS3XXX or PHYS4XXX or PHYS6XXX level), subject to prerequisite requirements.

### **Notes**

- 1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("must take") 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. Courses at the advanced level are subject to change.
- 3. Students must have level 3 or above in HKDSE Physics or equivalent to take this major. Students who do not fulfill this requirement are advised to take PHYS1240 Physics by inquiry.

### 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:

- (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)
- (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)
- (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)

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)

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 ("must take") 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. Courses at the advanced level are subject to change.

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:

- (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)
- (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)
- (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)

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)

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 ("must take") 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. Courses at the advanced level are subject to change.

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:

- (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)
- (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)
- (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)

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)

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 ("must take") 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. Courses at the advanced level are subject to change.

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:

- (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)
- (2) apply elementary methods and models for risk assessment and management
- (by means of coursework, tutorial classes and project-based learning in the curriculum)
- (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)

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)

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 ("must take") 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. Courses at the advanced level are subject to change.

### 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:

- (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)
- (2) apply elementary methods and models for risk assessment and management
- (by means of coursework, tutorial classes and project-based learning in the curriculum)
- (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)

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)

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 ("must take") 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. Courses at the advanced level are subject to change.

### 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:

- (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)
- (2) apply elementary methods and models for risk assessment and management
- (by means of coursework, tutorial classes and project-based learning in the curriculum)
- (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)

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)

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 ("must take") 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. Courses at the advanced level are subject to change.

### 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:

- (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)
- (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)
- (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 Risk Management

Major in Statistics

Minor in Risk Management

### Required courses (42 credits)

### 1. Introductory level courses (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)

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

Ш	t contract to the contract to	
		(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 ("must take") 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. Courses at the advanced level are subject to change.

### 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:

- (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)
- (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)
- (3) participate proactively in large-scale, multi-disciplinary studies, determine objective findings, and provide guidance on all aspects of data collection and analyses
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- 2. Courses at the advanced level are subject to change.

### Remarks:

Students taking double Majors,

Major-Minor or double Minors with overlapping course requirements

# SCIENCE

# SECTION VIII Students taking double Majors, Major-Minor or double Minors with overlapping course requirements

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science.
- 2. 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 ('must take') by both majors.
- 3. 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.
- 4. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("must take") 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) in the second major. The replacement course(s) must have the same prefix and at the same or higher level as the double-counted course(s).
- 5. Double counting of credits is not permissible for major–minor or double-minors combinations. When a course is required ("must take") both by the major and minor or by both minors, the student must take a replacement course for the minor. The replacement course must have the same prefix and at the same or higher level as the course to be replaced.
- 6. For situations 4 and 5 above, students have to complete the form "Application for Taking a Replacement Course for the Course Required in Two Different Majors/Minors."

Course Descriptions of BSc and

**Language Courses** 

# SCIENCE

· · · · · · · · · · · · · · · · · · ·		try (6 credits)		Academic Year	-	
Offering Department	Biochemis	·		Quota		
Course Co-ordinator		Dr J Tanner, Biochemistry (jatanner@hku.hk)				
Dr. M P M Wong, Biochemistry Dr L Y L Cheng, Biochemistry Dr J Tanner, Biochemistry Dr B C W Wong, Biochemistry						
- Teach students a biochemical perspective on each of the Basic Sciences focusing on conceptundamental to the learning of Biochemistry Promote deep learning of course material through an integrated programme of practical and collaborat 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.					I and collaborative stry.	
Course Contents & Topics	A Biochen	ical Perspective on the Basic S	ciences			
	The element electron); Water (than anyway?).	try for Biochemistry ents and bonding (from carbon Structure and conformation (thi e universal biochemical solve for Biochemistry	nking in 3 dimensions); Isor	merism (from mirro	rs to thalidomide)	
		building blocks of life (proteins volution (considering molecular				
	Thermody melting); \$	and Mathematics for Biocheminamics from a Biological Perspitatistics for biochemistry (applicals, logs and the limits of life).	pective; Introduction to mole			
	The protei	g Biochemistry n; The gene; Vitamins and dise cesses and failures.	ease; Synthetic biology; The	e challenges of mo	dern-day genetics	
Course Learning Outcomes	On succes	sful completion of this course, s	students should be able to:			
2230 Loanning Outcomes		e the basics of biomolecular str f biology, chemistry and physic			tegrating the basi	
20111119 Outcomes	sciences of 2. Apply I molecular 3. Interpre 4. Demor presentation 5. Relate I	f biology, chemistry and physics nowledge of biomolecular stru	s into a biochemical perspecture to review major disco or issues in biochemistry us collaborating together with the three basic sciences o	ctive. overies and conter sing the scientific lite h colleagues in p	mporary issues ir erature.	
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Pre-requisites (and Co-requisites and	sciences of 2. Apply I molecular 3. Interpre 4. Demor presentation 5. Relate I recognize Level 3 of componer Y 1st Y A+ to F  A B  C D  Fail  Lecture-ba  Activities  Group wo	f biology, chemistry and physica nowledge of biomolecular strubiology. ta scientific data and discuss may strate skills in working and on of scientific ideas. Now biochemistry intersects with the transition from school to unity above in HKDSE Biology, to requivalent sem  Exceptionally good performance deinto use of scientific data and the scientific literature; good prescientific data and the scientific literature; limited proportionally good prescientific data and the scientific literature; limited proportionally good prescientific data and the scientific literature; limited proportionally good prescientific literature; limited proportionally good prescientific literature; limited proportionally good prescientific literature; limited proportionally good performance demonstrating and the scientific literature; limited proportionally good prescientific literature; limited proportionally good prescientific literature; limited proportionally good prescientific literature; limited proportionally good performance demonstrating and the scientific literature; limited proportionally good performance demonstrating and the scientific literature; limited proportionally good performance demonstrating and the scientific literature; limited proportionally good performance demonstrating and the scientific literature; limited proportionally good performance demonstrating and the scientific literature; good prescientific literature; limited proportionally good performance demonstrations good prescientific literature; good	s into a biochemical perspecture to review major disconstruction of the collaborating together with the three basic sciences of versity level study.  Chemistry, or Combined Security of the subject material in the sentation and group collaboration setting adequate understanding of the subject material was entation and group collaboration and group collaborates.  Details  or workshops	ctive. overies and conter sing the scientific lite h colleagues in p of biology, chemistry Science with Biolo  Examination  Examination  Standing of the subject ion and group collaboration and group collaboration skills. The subject matter; some ability is skills. The of scientific data; no	mporary issues in erature. practicals and in a rand physics, and any or Chemistry  Dec  matter; critical insight tion skills. The use of scientific data are insight into use of to use scientific data understanding of the  No. of Hours  12  50  30  Weighting in fina	
Pre-requisites (and Co-requisites and Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade Grade Descriptors  Course Type Course Teaching & Learning Activities	sciences of 2. Apply I molecular 3. Interpre 4. Demor presentation 5. Relate I recognize Level 3 of componer Y 1st Y A+ to F  A B  C D  Fail  Lecture-ba  Activities Lectures  Group work Reading Assessm	f biology, chemistry and physica nowledge of biomolecular strubiology. ta scientific data and discuss may strate skills in working and on of scientific ideas. Now biochemistry intersects with the transition from school to unity above in HKDSE Biology, to requivalent sem  Exceptionally good performance deinto use of scientific data and the scientific literature; good prescientific data and the scientific literature; limited performance demonstrating and the scientific literature; limited prescientific literature and unable to prescientific literature	s into a biochemical perspecture to review major discovered to reversity use collaborating together with the three basic sciences of the three basic sciences of the three basic sciences of the service of the three basic sciences of the three basic sciences of the service of the three basic sciences of three basic sciences of the three basic sciences of three basic	ctive. overies and conter sing the scientific lite h colleagues in p if biology, chemistry Science with Biolo  Examination  Examination  standing of the subject ion and group collaborate iter; coherent insight into skills. the subject matter; some ability of skills. e of scientific data; no	mporary issues in erature. practicals and in a rand physics, and any or Chemistry  Dec  matter; critical insight tion skills. Duse of scientific data the insight into use of to use scientific data	

	Project reports	group communication project	30
Required/recommended reading and online materials	TBC		

BIOC2600 Basic biochemi	stry (6 cred	aits)		Academic Year	2014		
Offering Department	Biochemis	Biochemistry Quota 300					
Course Co-ordinator	Prof D K Y	Prof D K Y Shum, Biochemistry (shumdkhk@hku.hk)					
Teachers Involved	Dr J A Tar	Prof D K Y Shum, Biochemistry Dr J A Tanner, Biochemistry Dr B C W Wong, Biochemistry					
Course Objectives	process. V and non-s	This course is designed to present an overview of biochemistry of fundamental importance to the life process. We aim to develop appreciation of the basics in biochemistry as a common ground for science and non-science students to progress into their areas of specialization. Students intending to pursue further studies in Biochemistry and Molecular Biology will find this course particularly helpful.					
Course Contents & Topics	enzymes;	Structure and functions of carbohydrates, lipids, nucleic acids, amino acids and proteins; enzymes and co enzymes; basic bioenergetics; key metabolic processes in a living cell; signaling across cell membranes; flow of genetic information					
Course Learning Outcomes	On succes	ssful completion of this course, stude	ents should be able to	:			
	<ol> <li>Explain</li> <li>Explain</li> </ol>	1. Relate structures to functions of biomolecules. 2. Explain the functions of key metabolic processes. 3. Explain the significance of signaling across cell membranes 4. Explain the flow of genetic information					
Pre-requisites (and Co-requisites and Impermissible combination)		Pass in BIOC1600 Perspectives in biochemistry or BIOL1110 From molecules to cells; and Not for students who have passed in BIOL2220 Principles of biochemistry or already enrolled in this course.					
Offer in 2014 - 2015	Y 1st	sem		Examination	Dec		
Offer in 2015 - 2016	Υ						
Course Grade	A+ to F						
Grade Descriptors	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.						
	С	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 rang					
	D	Demonstrates partial but limited command of knowledge and analytical skills as required for attainment of son the course learning outcomes; limited evidence of critical thinking towards application of the knowledge in a range contexts.					
	Fail	Demonstrates little or no evidence of cor course learning outcomes; lacking in critic					
Course Type	Lecture-ba	ased course					
Course Teaching & Learning Activities	Activities	3	Details		No. of Hours		
& Learning Activities	Lectures				36		
	Tutorials				12		
	Reading /	Self study			100		
Assessment Methods and Weighting	Methods		Details		Weighting in final course grade (%)		
	Assignments				20		
	Examination				60		
	Test				20		
Required/recommended reading	Test  Nelson DL, Cox MM (2008) Lehninger Principles of Biochemistry, 5th ed. W.H. Freeman, New York.  Any other Biochemistry textbooks, e.g. Berg JM, Tymoczko JL, Stryer L (2012) Biochemistry, 7th ed. W.Freeman, New York.						

BIOC3601 Basic Metab	Academic Year	2014				
Offering Department	Biochemistry Quota					
Course Co-ordinator	Dr N S Wong, Biochemistry (nswong@hku.hk)					
Teachers Involved	Dr N S Wong, Biochemistry Dr Lydia Cheng, Biochemistry					
Course Objectives	This course aims to provide foundation concepts of metabolism. It will enable students of this course to see how some of the basic concepts in biochemistry (specifically those learned in BIOC1600 and					
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Required/recommended reading		Tymoczko JL, Stryer L (2007) Bioche	emistry, 6th ed. W.H. Freeman, New Yo with Clinical Correlations, 6th ed. Wiley			
	Assignments			20		
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)		
	Reading	/ Self study		100		
	Tutorials		working on problems relating to the lecture topics	12		
& Learning Activities	Lectures		glycolysis; gluconeogenesis; pentose phosphate pathway; glycogen metabolis; lipid metabolis; purine and pyrimidine metabolism; regulation and integration of metabolic pathways	36		
Course Teaching & Learning Activities	Activitie	5	Details	No. of Hours		
Course Type	Lecture-ba	ased course				
	Fail  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.					
	D Demonstrates limited knowledge and skills required for attaining some of the course learning outcomes. Shows poor analytical ability and logical thinking and is rarely able to apply knowledge to solve problems. Has difficulty in expressing ideas coherently.					
	C Demonstrates general but incomplete knowledge and skills required for attaining most of the course learning outcomes. Shows evidence of some analytical ability and logical thinking and is sometimes able to apply knowledge to familiar or uncomplicated situations. Sometimes communicates ideas 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.					
Grade Descriptors	A	A 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.				
Course Grade	A+ to F					
Offer in 2015 - 2016	Υ					
Offer in 2014 - 2015	Y 1st	sem	Examination	Dec		
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in BI I (Biochen	•	.2220 Principles of Biochemistry or MEI	DE2301 Life sciences		
Course Learning Outcomes	On successful completion of this course, students should be able to:  1. Explain the significance of individual steps in a metabolic pathway.  2. Recognize the importance and the need for regulation of metabolic pathways.  3. Discuss the roles of enzymes in the regulation of metabolic pathways.  4. Describe how metabolic process are integrated under different physiological and pathological conditions.					
O	synthesis and breakdown of glucose, glycogen, triacylglycerol, and amino acids. The metabolism of purines and pyrimidines will also be considered. Emphasis is on the understanding of the metabolic reactions involved and how they are regulated in relation to environmental cues. Metabolic derangements as a basis of diseases will also be discussed.					
Course Contents & Topics			pathways involved in the provision of energed in this course include those that			
	BIOC2600) could be applied to explain one of the most important and cardinal issues of biological life: acquisition of metabolic energy. The course will lay the foundation for the more advanced courses offe in the Biochemistry Major and will also serve as a useful complement to courses on nutrition.					

BIOC3602 Understanding metabolism diseases (6 credits)  Academic Year 20					
Offering Department	Biochemistry	Quota 40			
Course Co-ordinator	Dr L Y L Cheng, Biochemistry (Icheng@hku.hk)				
Teachers Involved	Dr L Y L Cheng, Biochemistry				
Course Objectives	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	Knowledge of major pathways is applied to the understanding of disease course will be delivered in the form of lectures, presentations, etc. at aids to illustrate the major concepts of metabolic diseases. The second in a tutorial format in which students are given cases to analyse references. Metabolic disturbances which lead to diabetes will be discussed.	nd supplemented wit I half of the course w and search for solu	th audio-visual rill be delivered		

Course Learning Outcomes	On succ	On successful completion of this course, students should be able to:					
	2. Illustra 3. Explai	<ol> <li>Apply the knowledge of major metabolic pathways to the understanding of disease mechanisms.</li> <li>Illustrate the major concepts of metabolic diseases and discuss the metabolic disturbances in diseases.</li> <li>Explain the importance of metabolic integration and control.</li> <li>Develop critical thinking, problem-solving and presentation skills.</li> </ol>					
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in I	Pass in BIOC3601 Basic Metabolism					
Offer in 2014 - 2015	N			Examination			
Offer in 2015 - 2016	N						
Course Grade	A+ to F						
Grade Descriptors	A	Demonstrates thorough and extensive knowl Shows strong analytical ability and logical thir wide range of complex situations. Presents id	nking in the critique of scien	tific data and is able to	apply knowledge to a		
	В	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 to a wide range of complex situations. Presents ideas coherently and collaborates effectively with peers.					
	С	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 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 outcomes. Shows poor analytical ability and logical thinking in the critique of scientific data and is rarely able to apply knowledge to solve problems. Lacks clarity when presenting ideas and reluctantly collaborates with peers.					
	Fail	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-	based course					
Course Teaching	Activiti	es	Details		No. of Hours		
& Learning Activities	Lecture	s			36		
	Tutorial	s			12		
	Reading	g / Self study			100		
Assessment Methods and Weighting	Method	ls	Details		eighting in final ourse grade (%)		
	Assignn	nents			50		
	Examination				50		
Required/recommended reading and online materials	TBC	TBC					

BIOC3604 Essential techn credits)	iques in biochemistry and molecular biology (6	Academic Year	2014			
Offering Department	Biochemistry	Quota	60			
Course Co-ordinator	Dr K M Yao, Biochemistry (kmyao@hku.hk)					
Teachers Involved	Prof D K Y Shum, Biochemistry Dr B C W Wong, Biochemistry Dr N S Wong, Biochemistry Dr K M Yao, Biochemistry Dr Z J Zhou, Biochemistry					
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; experimental approaches - genetic, biochemical, molecular, genomic and others; methods for isolation and analysis of carbohydrates, proteins, lipids and nucleic acids; subcellular fractionation; enzyme assays and spectrophotometry; basic nucleic acid manipulation - PCR, site-directed mutagenesis, blotting and hybridization, cloning strategies, restriction mapping.					
Course Learning Outcomes	On successful completion of this course, students should be able to:  1. Explain the basic principles of various biochemical and molecular  2. Describe different experimental approaches for achieving defined  3. Apply different techniques to biochemical and molecular analyses  4. Write and maintain a scientific laboratory notebook satisfactorily.	techniques. experimental aims.				
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in BIOC2600 Basic biochemistry or BIOL2220 Principles of Bio	ochemistry				
Offer in 2014 - 2015	Y 2nd sem	Examination	May			
Offer in 2015 - 2016	Υ	·	·			
Course Grade	A+ to F					

Grade Descriptors	A Demonstrates thorough and extensive knowledge and skills required for attaining all the course learning outcomes. Shows strong analytical ability and logical thinking, with evidence of original thought. Competently conducts laboratory skills and techniques with confidence and can critically appraise data to draw appropriate and insightful conclusions.						
	В	B Demonstrates substantial knowledge and skills required for attaining most of the course learning outcomes. Shows evidence of critical thinking and analytical skills. Conducts laboratory skills and techniques with confidence and can appraise data to draw appropriate conclusions.					
	С	outcomes. Shows some evidence	olete knowledge and skills required for of critical thinking and analytical skills. Or see and can sometimes correctly appraise of	onducts laboratory skills and techniques			
	D		nowledge and skills required for attaining analytical skills. Displays poor laboratory susions.				
	Fail		of knowledge and skills required for attain g. Displays ineffective lab skills and techr				
Course Type	Lecture w	vith laboratory component cours	e				
Course Teaching	Activities		Details	No. of Hours			
& Learning Activities	Lectures			12			
	Laboratory			54			
	Tutorials			6			
	Reading / Self study			76			
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)			
	Assignments			50			
	Examination			50			
Required/recommended reading and online materials	Cox MM, Doudna JA and O'Donnell M (2012) Molecular Biology: Principles and Practice, Macmillan. Scopes RK (1994) Protein Purification: Principles and Practice. Springer Advanced Texts in Chemistry, Springer-Verlag, New York. Wilson K, Walker KM (2005) Principles and Techniques of Biochemistry and Molecular Biology. Cambridge University Press, Cambridge.						

BIOC3605 Sequence bioin	formatics (	6 credits)	Academic Year	2014			
Offering Department	Biochemis	ry	Quota	50			
Course Co-ordinator	Dr B C W	Dr B C W Wong, Biochemistry (bcwwong@hku.hk)					
Teachers Involved	Dr B C W	Vong, Biochemistry					
Course Objectives	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 and Entrez and alignment,	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:  1. Search and retrieve sequence information from biological databases. 2. Describe the algorithms for pairwise and multiple alignments, BLAST search, and phylogenetic tre construction. 3. Perform sequence analysis using EMBOSS package and other web-based analysis tools. 4. Interpret results from sequence alignments and BLAST database searches. 5. Use results from various sequence analysis tools to annotate a biological sequence.						
Pre-requisites (and Co-requisites and Impermissible combination)		OC2600 Basic biochemistry or BIOL2220 Principles of BBMS2007 Essential molecular biology	of biochemistry or B	BMS2003 Humar			
Offer in 2014 - 2015	Y 2nd	Y 2nd sem Examination May					
Offer in 2015 - 2016	Υ		·	<u>'</u>			
Course Grade	A+ to F						
Grade Descriptors	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.						
	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.						
	С	Demonstrates general but incomplete command of knowledge and learning outcome; some critical thinking; adequate ability to apply bid					

	Fail		ce of command of knowledge and skills re little or no ability to apply bioinformatics sk			
Course Type	Lecture-based course					
Course Teaching & Learning Activities	Activities		Details	No. of Hours		
	Lectures			36		
	Tutorials			12		
	Reading / Self study			100		
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)		
	Assignments			30		
	Examina	ation		70		
Required/recommended reading and online materials	Proteins, Mount D	Baxevanis AD, Ouellette BFF (2005) Bioinformatics: A Practical Guide to the Analysis of Genes and Proteins, 3rd ed. Wiley, Hoboken, N.J. Mount DW (2004) Bioinformatics: Sequence and Genome Analysis, 2nd ed. Cold Spring Harbor Laboratory Press, Cold Spring Harbor, New York.				

BIOC3606 Molecular medi	cine (6 cre	dits)	Academic Yo	ear 2014			
Offering Department	Biochemi	stry	Quota	50			
Course Co-ordinator	Prof D Y Jin, Biochemistry (dyjin@hku.hk)						
Teachers Involved	Prof D Y Prof M H	Prof K S E Cheah, Biochemistry Prof D Y Jin, Biochemistry Prof M H Sham, Biochemistry Dr. CH Fu, Biochemistry					
Course Objectives	To provide up-to-date knowledge of the molecular and cellular basis of human diseases including cance and infection with HIV and influenza viruses, thereby preparing the students for a career in biomedical biotechnological, pharmaceutical and genomic research.						
Course Contents & Topics	topics madeath, of pathogen therapy, a	This course covers molecular basis of cancer and viral diseases, and molecular therapeutics. Specific topics may include mouse model of human diseases, cell cycle regulation, cell motility, programmed cell death, oncogenes and tumor suppressor genes, genome instability, HIV science, genetics and pathogenesis of influenza viruses, molecular approaches to vaccine development, stem cells, gene therapy, and nucleic acid therapeutics.  Basic knowledge of biochemistry and molecular cell biology is assumed for students taking this course.					
Course Learning Outcomes	On succe	ssful completion of this course, student	s should be able to:				
	<ol> <li>Ilustrate</li> <li>Integra</li> </ol>	<ol> <li>Explain the molecular mechanisms underlying cancers and viral diseases.</li> <li>Ilustrate the application of molecular biology in medicine with examples.</li> <li>Integrate and translate knowledge in molecular biology to new approaches in disease prevention and intervention.</li> </ol>					
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in B	Pass in BIOC2600 Basic Biochemistry or BIOL2220 Principles of Biochemistry					
Offer in 2014 - 2015	Y 2nd	d sem	Examination	May			
Offer in 2015 - 2016	Υ						
Course Grade	A+ to F						
Grade Descriptors	A Displays a comprehensive grasp of the key concepts underlying the molecular basis of human diseases, with few omissions or errors. Able to articulate clearly with examples how knowledge in molecular biology can lead to new strategies in disease prevention and intervention. Evidence of strong analytical and critical thinking when dealing with complex scientific data. Some evidence for additional information beyond what is given in the lectures.						
	B Displays a substantial and near-complete grasp of the key concepts underlying the molecular basis of human diseases, but without depth in some areas and with some omissions and factual errors. An understanding of the topic though is clear. Able to relate knowledge in molecular biology to new strategies in disease prevention and intervention. Able to apply analytical and critical thinking skills when dealing with scientific data.						
	С	C Displays a general understanding of the key concepts underlying the molecular basis of human disease and is sometimes able to relate knowledge in molecular biology to new strategies in disease prevention and intervention. Sometimes able to apply analytical and critical thinking skills when dealing with scientific data.					
	D	D Displays a limited understanding of the key concepts underlying the molecular basis of human disease and is rarely able to relate knowledge in molecular biology to new strategies in disease prevention and intervention. Evidence of weak analytical and critical thinking skills when dealing with scientific data.					
	Fail	Displays an incorrect or incomplete underst disease and is unable to relate this knowled thinking skills when dealing with scientific dat	ge to effective treatment strategies. No evid				
Course Type	Lecture-b	ased course					
Course Teaching	Activities Details		Details	No. of Hours			
& Learning Activities	Lectures			30			
	Tutorials			1:			
		/ Self study		10			

Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)			
	Examination		80			
	Test		20			
Required/recommended reading		Lodish et al: Molecular Cell Biology 7th ed., 2013 (4th ed. is available at NCBI Books)				
and online materials	Cassimeris et al: Lewin's Cells, 2nd ed., 2011	Alberts et al: Molecular Biology of the Cell 4th ed., 2008 (4th ed. is available at NCBI Books) Cassimeris et al: Lewin's Cells, 2nd ed., 2011				

BIOC3999 Directed studie	es in bioche	emistry (6 credits)		Academic Year	2014	
Offering Department	Biochemi	stry		Quota	36	
Course Co-ordinator	Dr J D Hu	ang, Biochemistry (jdhuang@	hku.hk)			
Teachers Involved		Dr J D Huang, Biochemistry All academic staff, Biochemistry				
Course Objectives		To enhance students knowledge of a particular topic and the students self-directed learning and critical thinking skills.				
Course Contents & Topics	member.	The student undertakes a self-managed study on a topic in biochemistry under the supervision of a staf member. The topic is preferably one not sufficiently covered in the regular curriculum. The directed study can be a critical review or a synthesis of published work on the subject. A laboratory or field study may also be involved that would enhance the student's understanding of the subject.				
Course Learning Outcomes	On succe	On successful completion of this course, students should be able to:				
	2. Examir	<ol> <li>Critically appraise research literature in a specific area of biochemistry and molecular biology.</li> <li>Examine the theoretical or experimental basis for existing concepts.</li> <li>Identify questions and evaluate issues for further research development.</li> </ol>				
Pre-requisites (and Co-requisites and Impermissible combination)	including	Pass in at least 24 credits of advanced level (level 3 or 4) compulsory/core courses in Biochemistry Maj including BIOC2600 Basic biochemistry and BIOL3401 Molecular biology. This capstone course is for Biochemistry Major students only.				
Offer in 2014 - 2015	Y 2nd	sem Summer		Examination	No Exam	
Offer in 2015 - 2016	Υ					
Course Grade	A+ to F					
Grade Descriptors	Produces a sophisticated and detailed appraisal of the biochemical literature, displaying a comprehensive and deep understanding of the selected topic. Able to contextualize all the ideas within a personal framework of knowledge and evaluate relevant issues emerging from the study. Works proactively with a supervisor to enhance understanding and scientific writing skills. Communicates the findings to a broader audience in an effective way and responds knowledgeably to questions. Excellent time-management skills and able to reflect honestly on one's own learning.					
	В	Produces a coherent appraisal of the biochemical literature, displaying a sound understanding of the selected topic. Able to contextualize many of the ideas within a personal framework of knowledge and identify some relevant issues emerging from the study. Works constructively with a supervisor to enhance understanding and scientific writing skills. Clearly communicates the findings to a broader audience and responds knowledgeably to most questions. Able to time-manage effectively and reflect on one's own learning.				
	С	Produces a reasonable appraisal of the biochemical literature, displaying an adequate understanding of the selected topic. Able to contextualize a few of the ideas within a personal framework of knowledge and makes some attempt to identify some relevant issues emerging from the study. Works with a supervisor and other co-workers to improve understanding and scientific writing skills. Communicates the findings to a broader audience with reasonable clarity and responds to most questions. Acceptable time-management and self-reflection skills.				
	D	Produces a superficial appraisal of the biochemical literature, displaying a limited understanding of the selected topic. Able to contextualize a few of the ideas within a personal framework of knowledge but unable to identify any relevant issues emerging from the study. Works reluctantly with a supervisor and other co-workers to develop understanding and scientific writing skills. Displays weak communication skills when presenting the findings to a broader audience. Poor time-management and self-reflection skills.				
	Fail  Fails to appraise the biochemical literature and thus unable to display any understanding of the selected topic. Unable to contextualize the ideas within a personal framework of knowledge or identify any relevant issues emerging from the study. Works in isolation, thus failing to make progress in understanding and scientific writing skills. Unable to communicate effectively when presenting the findings to a broader audience. No time-management skills or ability to self-reflect.					
Course Type	Project-ba	ased course				
Course Teaching	Activitie	s	Details		No. of Hours	
& Learning Activities	Reading	/ Self study	at least 120 hours	on the project	120	
Assessment Methods and Weighting	Methods	•	Details	. ,	Weighting in fina course grade (%	
	Dissertat	ion	including mind ma	p (10%)	60	
	Oral pres	entation		-	25	
	Researc	n report	Supervisor comme	ents	15	
Required/recommended reading and online materials	as sugges	sted by project supervisors	I .			

Offering Department	Biochemis	stry		Quota	50	
Course Co-ordinator	Dr K M Ya	ao, Biochemistry (kmyao@hku	ı.hk)			
Teachers Involved	Dr D Chai Dr CH Fu Prof D K	Dr D Chan, Biochemistry Dr CH Fu, Biochemistry Prof D K Y Shum, Biochemistry Dr K M Yao, Biochemistry				
Course Objectives	multicellul	This course aims at providing students an in-depth understanding of molecular and cellular signaling in multicellular organisms. This course is particularly useful for students interested in research or intending to develop a career in biomedical sciences.				
Course Contents & Topics	Cell-surfa mechanis kinases, t	A. Inter and intracellular signal transduction mechanisms Cell-surface receptors and signal transduction proteins; G-Protein-coupled receptors: structure amechanism; signaling pathways that control gene expression: receptors that activate protein tyroskinases, the Ras/MAP kinase pathway, phosphoinositide signaling pathways and receptor serine kina that activate Smads				
	The micro	eleton as target of signal trans otubule cytoskeleton; kinesin a cytoskeletion and cell behavio	and dynein motor; the actin		the intermediate	
	Transloca	n trafficking and sorting pathwa tion of secretory proteins - on, folding and quality control essing	insertion into the ER; ma			
	Cell-cell a	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 succes	ssful completion of this course	e, students should be able to	D:		
		Describe the molecular and cellular signal transduction mechanisms that mediate cellular communication to achieve a plethora of cellular responses.				
	cytoskelet	2. Illustrate the controls of the metabolic and cellular regulation based on their understanding of cytoskeleton as target of signal transduction, protein trafficking and sorting pathways, and cell-cell and cell matrix adhesion.				
	3. Develop critical thinking and analytical skills.					
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in technolog	Pass in BIOC3601 Metabolism or BIOL3401 Molecular biology or BIOL3402 Cell biology and cell technology or BIOL3404 Protein structure and function				
Offer in 2014 - 2015	N			Examination		
Offer in 2015 - 2016	Υ					
Course Grade	A+ to F					
Grade Descriptors	A	A Demonstrate thorough and complete mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong critical thinking and analytical skills, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations.				
	В					
	С					
	D	D Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some critical thinking, but with limited analytical skills. Show limited ability to apply knowledge to solve problems.				
	Fail	Fail  Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of critical thinking and analytical skills. Show very little or no ability to apply knowledge to solve problems.				
Course Type	Lecture-ba	ased course				
Course Teaching	Activitie	s	Details		No. of Hours	
& Learning Activities	Lectures				36	
	Tutorials				12	
	D !!	Reading / Self study			100	
	Reading					
		3	Details		eighting in final ourse grade (%)	
			Details			
Assessment Methods and Weighting	Methods	ents	Details		ourse grade (%	

BIOC4611 Advanced bioch		-		_		
Offering Department	Biochemi	istry		Quota	50	
Course Co-ordinator	Dr D Cha	n, Biochemistry (chand@hk	ru.hk)			
Teachers Involved	Dr M Kota Dr C M C Dr J Tanı	Dr D Chan, Biochemistry Dr M Kotaka, Physiology Dr C M Qian, Biochemistry Dr J Tanner, Biochemistry Dr N S Wong, Biochemistry				
Course Objectives	sequence	This course is aim at providing students with an up-to-date knowledge of protein biochemistry from sequence to structure and disease; realizing the importance of kinetics in cellular function and an appreciation of the technological advances in the characterization of macromolecules.				
Course Contents & Topics	conforma biomolec magnetic	Topics including protein folding and misfolding in diseases; conformation of proteins and the role of conformational changes in protein function; catalytic mechanisms of enzymes and enzyme kinetics; biomolecular interactions; characterization of macromolecules using X-ray crystallography, nuclear magnetic resonance and other spectroscopy methods; protein engineering and therapeutic approaches targeting protein function.				
Course Learning Outcomes	On succe	essful completion of this cou	rse, students should be able to	<b>)</b> :		
Pre-requisites	<ol> <li>Recog</li> <li>Derive</li> <li>Apply</li> <li>and appli</li> </ol>	1. Describe how protein structures inform functions. 2. Recognize the roles of enzyme kinetics in cellular functions. 3. Derive structural information of macromolecules from experimental data. 4. Apply their knowledge on protein engineering and therapeutics, and on experimental designs in basic and applied research.				
(and Co-requisites and Impermissible combination)	Chemistr	Pass in BIOC3601 Metabolism; and BIOL3404 Protein Structure and Function or CHEM2441 Organic Chemistry I; and Pass in BIOC4610 Advanced Biochemistry I, or already enrolled in this course				
Offer in 2014 - 2015	N			Examination		
Offer in 2015 - 2016	N					
Course Grade	A+ to F					
Grade Descriptors	Α	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.				
	В	Clear description of how protein structure informs function; evidence of ability to recognize mechanisms of enzyme function and interpretation of data; capable demonstration of applying knowledge to the design of scientific methodologies; and cohesive and systematic organization of information for presentation and communication.				
	С	Awareness of how protein structure informs function; some evidence of ability to recognize mechanisms of enzyme function and interpretation of data; some capable demonstration of applying knowledge to the design of scientific methodologies and systematic organization of information for presentation and communication.				
	D	Superficial awareness of how protein structure informs function; limited evidence of ability to recognize mechanisms of enzyme function and interpretation of data; superficial demonstration of applying knowledge to the design of scientific methodologies and limited organizational skill of information for presentation and communication.				
	Fail					
Course Type	Lecture-b	pased course				
Course Teaching	Activitie	?S	Details		No. of Hours	
& Learning Activities	Lectures	-			36	
	Tutorials				12	
		/ Self study			100	
Assessment Methods and Weighting	Method	,	Details		eighting in final	
	Assignm	nents			30	
	Examina				70	
Required/recommended reading	Fersht A		anism in Protein Science: A	Guide to Enzyme Cata		

BIOC4612 Molecular bi	Academic Year	2014			
Offering Department	Biochemistry	50			
Course Co-ordinator	Prof K S E Cheah, Biochemistry (hrmbdkc@hku.hk)				
Teachers Involved	Prof K S E Cheah, Biochemistry Prof M H Sham, Biochemistry Dr K M Yao, Biochemistry Dr Z J Zhou, Biochemistry				
Course Objectives	To provide an up-to-date knowledge of molecular biology, eukaryotic gene expression, molecular embryology.	especially with respect to	the regulation o		

Course Contents & Topics	This is a comprehensive course covering many detailed molecular aspects of gene regulation and gene function. Through this course an understanding of how gene expression can be regulated at levels of transcription and post transcription will be gained.					
Course Learning Outcomes	On successful completion of this course, students should be able to:  1. Describe the mechanisms for regulation of transcription, RNA processing and translation in eukaryotes.  2. Explain how cellular homeostasis can be maintained by a combination of controls of gene expression at multiple levels.  3. Illustrate the hierarchy of gene expression regulation in multicellular developmental processes.  4. Interpret experimental results in gene regulation studies.					
Pre-requisites (and Co-requisites and Impermissible combination)		Pass in BIOC3601 Metabolism or BIOL3401 Molecular biology or BIOL3402 Cell biology and cell technology or BIOL3404 Protein structure and function				
Offer in 2014 - 2015	N			Examination		
Offer in 2015 - 2016	Υ					
Course Grade	A+ to F					
Grade Descriptors	A Demonstrates a deep and comprehensive understanding of the regulation of eukaryotic gene expression and its relevance to disease and effectively relates the knowledge to multicellular developmental processes. Uses skill and insight to analyse and interpret experimental data from gene regulation studies.					
	В	B Demonstrates a competent grasp of the key concepts in the regulation of eukaryotic gene expression and its relevance to disease and is able to link the knowledge to multicellular developmental processes. Correctly analyses and interprets experimental data from gene regulation studies.				
	С	Demonstrates a basic understanding of the regulation of eukaryotic gene expression and its relevance to disease and is sometimes able to relate the knowledge to multicellular developmental processes. Displays a limited capacity to analyse and interpret experimental data from gene regulation studies.				
	D	D Demonstrates a simplistic knowledge of the regulation of eukaryotic gene expression and rarely relates the information to multicellular developmental processes. Displays weak analytical skills and is rarely able to interpret experimental data from gene regulation studies.				
	Fail  Demonstrates incomplete or incorrect knowledge of the regulation of gene expression and is unable to relate the ideas to multicellular developmental processes. Unable to analyse or interpret experimental data from gene regulation studies.					
Course Type	Lecture-ba	ased course				
Course Teaching	Activities	S	Details		No. of Hours	
& Learning Activities	Lectures				36	
	Tutorials				12	
	Reading / Self study				100	
Assessment Methods and Weighting	Methods		Details		Weighting in final course grade (%)	
	Assignme	ents			20	
	Examinat	ion			80	
Required/recommended reading and online materials	Lewin B (2	et al. (2007) Molecular Biology of the C 2008) Genes IX. Jones and Bartlett Pub D et al. (2008) Molecular Biology of	olishers, Sudbury, Ma	ass.		

BIOC4613 Advanced technologies)	niques in biochemistry & molecular biology (6	Academic Year	2014		
Offering Department	Biochemistry	Quota	50		
Course Co-ordinator	Dr D Chan, Biochemistry (chand@hku.hk)				
Teachers Involved	Dr D Chan & Dr J Tanner, Biochemistry Prof D Y Jin & Dr B C W Wong, Biochemistry Dr J D Huang, Biochemistry Dr K M Yao, Biochemistry Dr V Lui, Surgery				
Course Objectives	This is an advanced experimental-based course for students majoring in Biochemistry and related disciplines. The aim is to provide the necessary training for students to pursuit postgraduate research education and potential employment in a scientific laboratory/industry environment.				
Course Contents & Topics	Hands-on experiments using advanced techniques in biochemistry, molecular and cell biology, and bioinformatics. Students will also have the opportunity to familiarize themselves with modern instruments used in life sciences.				
Course Learning Outcomes	On successful completion of this course, students should be able to:  1. Explain the basic principles of current advanced techniques commonly used in biochemistry and molecular biology.  2. Apply and perform these techniques in other novel experimental settings.  3. Critically evaluate experimental data.  4. Design alternative approaches to test or validate hypotheses.  5. Write a concise experimental report using correct terminologies and nomenclatures.				
Pre-requisites (and Co-requisites and	Pass in BIOC3604 Essential techniques in biochemistry and molecular biology				
	280				

Impermissible combination)						
Offer in 2014 - 2015	Y 1s	sem	Examination	Dec		
Offer in 2015 - 2016	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.					
	В	B Comprehensive understanding of the principles and applications of advance technologies in biochemistry; clear ability to identify problems and generate solutions relating to applications in a laboratory setting; evidence of ability to evaluate experimental data; systematic planning and organization of experimental design and presentation of experimental data.				
	С	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 v	vith laboratory component course				
Course Teaching	Activitie	es De	tails	No. of Hours		
& Learning Activities	Lectures			12		
	Laboratory			54		
	Tutorials			6		
	Reading / Self study			76		
Assessment Methods and Weighting	Method	S Det	tails	Weighting in final course grade (%)		
	Assignm	ents		50		
	Examination		e 3-hour written examination	50		
Required/recommended reading and online materials		Walker JM (2005) Principles and Technique Press, Cambridge.	es of Biochemistry and Molecula	r Biology. Cambridge		

<b>BIOC4966 Biochemistry in</b>	nternship (	(6 credits)	Academic Year	2014		
Offering Department	Biochemist	try	Quota	20		
Course Co-ordinator	Dr J D Hua	r J D Huang, Biochemistry (jdhuang@hku.hk)				
Teachers Involved		Or J D Huang, Biochemistry All academic staff, Biochemistry				
Course Objectives	major of st knowledge	his course aims to offer students the opportunities to gain work experience in the industry related to their najor of study. The workplace learning experience would be of great benefit to the students to apply their nowledge gained in the study to the real work environments. Students have to take on at least 160 hours of ternship work either within the University or outside the University arranged by the School/Departments.				
Course Contents & Topics	or various  2. Outside student wil	<ol> <li>Within the university: The student will be supervised by a staff member (Supervisor), working on a project or various tasks as instructed by the Supervisor.</li> <li>Outside the university: The student will work in an external agency related to the major of study. The student will be supervised under a staff member of the external agency (the External Supervisor) and a staff member of the Department/School of the student (the Internal Supervisor).</li> </ol>				
Course Learning Outcomes	1. Recogni 2. Examine	On successful completion of this course, students should be able to:  1. Recognize the strengths and limitations of their area of training or expertise.  2. Examine the role of science in our society.  3. Acquire problem-solving skills to solve novel and ill-defined problems.				
Pre-requisites (and Co-requisites and Impermissible combination)	including B Students a	Pass in a least 24 credits of advanced level (level 3 or 4) compulsory/core courses in Biochemistry Major ncluding BIOC3604 Essential techniques in biochemistry & molecular biology. Students are expected to have satisfactorily completed their Year 3 study. This capstone course is for Biochemistry Major students only.				
Offer in 2014 - 2015	Y Sum	nmer	Examination	No Exam		
Offer in 2015 - 2016	Υ		·			
Course Grade	Pass/Fail					
Grade Descriptors	Pass	Able to apply knowledge to solve problems in the workplace. Succe the job or assigned by supervisor(s). Establishes effective colle colleagues, and clients in the job. Successfully fulfills the requirer working hours, written and oral report, and evaluation by supe	aboration and communication	on with supervisor(s) Description regardin		

		performance in the above would be awarded a grade of "Distinction".				
	Fail	Very limited or no ability to solve problems in the workplace. Fails to handle or carry out the work required in the job of assigned by supervisor(s). Fails to establish effective collaboration or communication with supervisor(s), other colleagues, 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	Internshi	nip				
Course Teaching	Activities		Details	No. of Hours		
& Learning Activities	Internship work		it is expected that students are to work at least 160 hours (or the equivalent of 4 weeks full-time)	160		
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)		
	Written report		written report, employer's feedback and oral presentation	100		
Additional Course Information	Students are expected to have satisfactorily completed their Year 3 study. Special consideration be given those who have completed Year 2.  Satisfactory completion of this course can be counted towards the Capstone requirement. Details contents internship will be recorded on the student's transcript. This course will be assessed on "Pass, Fail and Distinction" basis. Students who are interested to enrol in this course should contact the Department obtain the approval.  Enrolment of this course is not conducted via the online course selection system and should be made through the relevant Department/School office after approval has been obtained from the course coordinator.					

	roject (12 ci	redits)	Academic Year	2014		
Offering Department	Biochemist	ry	Quota	25		
Course Co-ordinator	Dr N S Wo	ng, Biochemistry (nswong@hku.hk)				
Teachers Involved		Dr N S Wong, Biochemistry All academic staff, Biochemistry				
Course Objectives	communica	To enable students to acquire the basic skills in scientific research: literature search, critical reasoning communication (both orally and in writing), teamwork and time management. The course is particularly useful for those students who intend to pursue a career in life science.				
Course Contents & Topics	Experimen Critical app Formulatio Design of e Data analy	Project-related topics in biochemistry, cell and molecular biology.  Experimental methods in protein and nucleic acid biochemistry; bioinformatics and cell biology.  Critical appraisal of current science literature  Formulation of research questions  Design of experiments.  Data analysis and interpretation.  Scientific writing				
Course Learning Outcomes	On succes	sful completion of this course, students should be able to	:			
	<ol> <li>Formula</li> <li>Apply ap</li> <li>Manage</li> </ol>	<ol> <li>Describe recent research development in a defined area of biochemistry and molecular biology.</li> <li>Formulate research questions and design experiments to address these questions.</li> <li>Apply appropriate experimental techniques to solve research problems.</li> <li>Manage and interpret experimental results.</li> <li>Develop scientific writing skills and logically report their research findings.</li> </ol>				
Pre-requisites (and Co-requisites and Impermissible combination)	including 4 BIOC3604 biochemist in these tw	Pass in at least 24 credits of advanced level (level 3 or 4) compulsory/core courses in Biochemistry Major including 4 of the following 5 courses: BIOL3401 Molecular Biology, BIOC3601 Basic Metabolism, an BIOC3604 Essential techniques in biochemistry and molecular biology; and BIOC4610 Advanced biochemistry and BIOC4613 Advanced techniques in biochemistry & molecular biology, or already enrolle in these two courses.				
	This capsto	o courses. one course is for Biochemistry Major students only.				
Offer in 2014 - 2015	This capsto		Examination			
			Examination	•		
Offer in 2015 - 2016	N		Examination	•		
Offer in 2015 - 2016 Course Grade	N Y		vestigation, framing the resea a meaningful body of data th al research question. Works c writing skills. Communicate	arch question within at is analysed with a proactively with a proactively step the findings to a		
Offer in 2015 - 2016 Course Grade	N Y A+ to F	Plans and executes a sophisticated and imaginative experimental in existing knowledge. Displays tenacity and commitment, generating insight and comprehensively evaluated in the context of the origin supervisor and other co-workers to enhance practical and scientific	vestigation, framing the resea a meaningful body of data the all research question. Works to writing skills. Communicate to questions. Excellent time-meaning the is analysed and evaluated in tructively with a supervisor are cates the findings to a broa	arch question within that is analysed with proactively with a sight findings to a anagement skills. Existing knowledge, the context of the dother co-workers		
Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade Grade Descriptors	N Y A+ to F	Plans and executes a sophisticated and imaginative experimental in existing knowledge. Displays tenacity and commitment, generating insight and comprehensively evaluated in the context of the origin supervisor and other co-workers to enhance practical and scientific broader audience in an effective way and responds knowledgeably to Plans and executes a detailed experimental investigation, framing t Works with commitment, generating a sufficient body of data that original research question with skill and understanding. Works const to enhance practical and scientific writing skills. Clearly community	vestigation, framing the resea a meaningful body of data that research question. Works to writing skills. Communicate or questions. Excellent time-meter research question within a sanalysed and evaluated in tructively with a supervisor arecates the findings to a brosectively.  ontextualize the research questionable analysis and evaluationable analysis and evaluations.	arch question within tat is analysed with proactively with a st the findings to a anagement skills. existing knowledge, the context of the dother co-workers der audience and estion. Works with on in the context of tical and scientific		

		skills.				
	Fail	Plans and executes a flawed or simplistic experimental investigation, which lacks a valid scientific conte commitment when collecting data and produces an incoherent analysis and evaluation. Works in is failing to improve practical and scientific writing skills. Displays weak communication skills when pr findings to a broader audience. No time-management skills.				
Course Type	Project-b	t-based course				
Course Teaching & Learning Activities	Activities		Details		No. of Hours	
a Learning Activities	Reading / Self study				240	
Assessment Methods and Weighting	Methods		Details		Weighting in final course grade (%)	
	Dissertation				60	
	Oral presentation		including continuous (15%)	assessment	40	
Required/recommended reading and online materials	None pre	scribed				

BIOL3404 Protein structur	e and fun	ction (6 credits)		Academic Year	2014
Offering Department	Biochemi	stry		Quota	160
Course Co-ordinator	Dr C M C	tian, Biochemistry (cmqian@hku.hk)			
Teachers Involved	Prof W W	ip, Biological Sciences  / M Lee, Biological Sciences  kian, Biochemistry			
Course Objectives	the meth	le students with a good understandi lods for study of both. This cours stry and biotechnology.			
Course Contents & Topics	higher structure Structure Enzymole Protein	se will include: Elements of structure ructures; Methods for determination ifugation and several hydrodynami and function: molecular motifs, rec ogy: kinetics and energetics of bind purification and characterization: ations of molecular masses and we	of structure: X-ray cryst ic methods for determin ognition and binding, evo ling, transition state and various liquid chromat	allography, various ation of molecular blution, natural and molecular mechan ographical method	optical methods size and shape; artificial mutants isms of catalysis, ds, methods of
Course Learning Outcomes	1. Demor 2. Design 3. Find or	On successful completion of this course, students should be able to:  1. Demonstrate a basic understanding of the relationship between protein structure and function.  2. Design assaying methods for enzymes.  3. Find out kinetic parameters of proteins or enzymes by graphically techniques.  4. Learn about the ways to purify protein and the many industrial uses of proteins.			
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in E	BIOC2600 Basic biochemistry or BIO	L2220 Principles of bioch	nemistry	
Offer in 2014 - 2015	Y 2n	d sem		Examination	May
Offer in 2015 - 2016	Υ				
Course Grade	A+ to F				
Grade Descriptors	A	Exceptionally good performance deminsight into the scientific literature. 3. Support of the scientific literature.			ect matter. 2. Critical
	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.				
	C 1. Satisfactory performance demonstrating adequate understanding of the subject matter. 2. Some insight into the scientific literature. 3. Adequate writing and group collaboration skills.				
	D 1. Limited performance demonstrating some understanding of basic subject matter. 2. Some ability to use the scientific literature. 3. Limited writing and group collaboration skills.				
	Fail	Poor understanding of subject matter. collaborate.	2. Little to no insight into use of	of the scientific literature.	3. Unable to write or
Course Type	Lecture-b	pased course			
Course Teaching & Learning Activities	Activitie	9S	Details		No. of Hours
a Learning Activities	Lectures	3			36
	Tutorials	3			12
	Reading	/ Self study			100
Assessment Methods and Weighting	Method	s	Details		/eighting in final course grade (%)
	Assignm	nents			30

Required/recommended reading and online materials	None prescribed To be announced.
Additional Course Information	This course will be offered subject to a minimum enrollment number and availability of teachers.

BIOL1110 From molecu	ules to cells	s (6 credits)		Academic Year	2014
Offering Department	Biological	Sciences		Quota	169
Course Co-ordinator	Prof B K C	Chow, Biological Sciences (bkcc@l	hku.hk)		
Teachers Involved	Dr C S C L Dr K W Y Y	Chow, Biological Sciences .o, Biological Sciences Yuen, Biological Sciences ang, Biological Sciences			
Course Objectives	later studie	e aims to provide basic conceptual es in applied biology, genetics, bioch and developmental biology.			
Course Contents & Topics	cells and to is divided in Genes and are the rull but not ide Metabolism requirement Cells and themselves cycle controlled Genetic en	passed approach will be adopted to on inspire further investigation through to 4 parts and the following is a list of inheritance: How do children reserves of genetic inheritance? What dentical to, their parents? What happer and Health: How are diets relants? Why can't we live without plants cell division: What are the commons to form tissues and organs? What old system goes wrong? How newly fingineering and modern biology: To we simportant?	h the exploration of conte of some of the questions mble their parents? What termines gender and sex n if some genes are non-fited to good health? Do ?? In features in a cell? How the is a cell cycle and how formed cells commit them that extent can genes be	emporary biological is to be asked and disc is the central dogma uality? Why is that c unctional or mutated' all humans have t do cells communica it is regulated? Wh selves for differentiat modified? Is gene the	ssues. The course cussed: of biology? What shildren resemble, ? the same dietary ate and assemble that happens if cellion? erapy the future of
Course Learning Outcomes	1. Underst living orgal 2. Learn th 3. Underst 4. Describ developme	e underlying principle on how mutat and the importance of dietary intake e various stages in a cell division ent.	es in a genome and the ion of a gene can lead to of biomolecules in relation and that disturbance of	the development of a nship to good health.	genetic disease.
		e concepts used in genetic engineer ome applications of genetic engineer		production of genetica	ally modified food.
Pre-requisites (and Co-requisites and Impermissible combination)				production of genetica	ally modified food.
(and Co-requisites and Impermissible combination)	6. Know so			eroduction of genetical	ally modified food.  Dec May
(and Co-requisites and impermissible combination) Offer in 2014 - 2015	6. Know so	ome applications of genetic engineer		<u> </u>	
(and Co-requisites and Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016	6. Know so	ome applications of genetic engineer		<u> </u>	
(and Co-requisites and Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade	6. Know so NIL  Y 1st s	ome applications of genetic engineer	nced level of extensive knowled cal abilities and logical thinking, ex, familiar and unfamiliar situat	Examination  dge required for attaining a with evidence of original ions. Apply highly effective	Dec May  all the course learning thought, and ability to e organizational skills.
(and Co-requisites and Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade	6. Know so NIL  Y 1st s Y A+ to F	ome applications of genetic engineer  sem 2nd sem  Demonstrate thorough mastery at an adva outcomes. Show strong analytical and criti apply knowledge to a wide range of comple	nced level of extensive knowled cal abilities and logical thinking, ex, familiar and unfamiliar situat 1, thoughtful intellectual engage or knowledge requivical and critical abilities and loghtpuly effective organizational	Examination  dge required for attaining a with evidence of original ions. Apply highly effective ment with broad range of ruired for attaining at leasingical thinking, and ability the second of the second or attaining at leasing and ability the second or attaining and ability the second or attaining and ability the second or attaining at leasing or attaining and ability the second or attaining at leasing at least attaining attaining attaining at least attaining at least attaining att	Dec May  all the course learning thought, and ability to e organizational skills. relevant concepts.  It most of the course to apply knowledge to
(and Co-requisites and Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade	6. Know so NIL  Y 1st s Y A+ to F	Demonstrate thorough mastery at an adva outcomes. Show strong analytical and criti apply knowledge to a wide range of comple Writings consistently demonstrate informed. Demonstrate substantial command of a blearning outcomes. Show evidence of anal familiar and some unfamiliar situations.	nced level of extensive knowled cal abilities and logical thinking, ex, familiar and unfamiliar situat d, thoughtful intellectual engage or knowledge requircal and critical abilities and logical thinking had range of relevant concepts. In an and of knowledge required for ical abilities and logical thinking nizational skills. Writings mostly	Examination  In the second of	Dec May  all the course learning thought, and ability to e organizational skills. relevant concepts. t most of the course to apply knowledge to emonstrate informed, see learning outcomes. ledge to most familiar
(and Co-requisites and Impermissible	6. Know so NIL  Y 1st s Y A+ to F  A B	Demonstrate thorough mastery at an adva outcomes. Show strong analytical and critiapply knowledge to a wide range of compl. Writings consistently demonstrate informed. Demonstrate substantial command of a blearning outcomes. Show evidence of anal familiar and some unfamiliar situations. thoughtful intellectual engagement with brown because of the common strate general but incomplete common Show evidence of some analytical and critisituations. Apply moderately effective orga	nced level of extensive knowled cal abilities and logical thinking, ex, familiar and unfamiliar situat di, thoughtful intellectual engage proad range of knowledge requivical and critical abilities and logical thinking and range of relevant concepts. In and of knowledge required for ical abilities and logical thinking nizational skills. Writings mostly afficient depth, breadth or under of knowledge required for attical thinking, but with limited an apply limited or barely effective.	Examination  Idge required for attaining a with evidence of original ions. Apply highly effective ment with broad range of ruired for attaining at least gical thinking, and ability to skills. Writings mostly deattaining most of the cours, and ability to apply know indicate informed, intellectanding.  aining some of the course alytical and critical abilities organizational skills. Writings mostly deattaining some of the course alytical and critical abilities organizational skills.	Dec May  all the course learning thought, and ability to e organizational skills. relevant concepts. It most of the course to apply knowledge to emonstrate informed, se learning outcomes. ledge to most familiar tual engagement with e learning outcomess. Show limited ability
(and Co-requisites and Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade	6. Know so NIL  Y 1st s Y A+ to F  A B	Demonstrate thorough mastery at an adva outcomes. Show strong analytical and critiapply knowledge to a wide range of compli Writings consistently demonstrate informed. Demonstrate substantial command of a blearning outcomes. Show evidence of anal familiar and some unfamiliar situations. thoughtful intellectual engagement with brown because of the complete completes on the complete completes of the control of the complete completes or the control of the complete completes or the control of the con	nced level of extensive knowled cal abilities and logical thinking, ex, familiar and unfamiliar situat d, thoughtful intellectual engage proad range of knowledge required and critical abilities and logical thinking had range of relevant concepts. In and of knowledge required for cical abilities and logical thinking nizational skills. Writings mostly ufficient depth, breadth or under of knowledge required for attical thinking, but with limited an apply limited or barely effective neories but mostly at a superficiand of knowledge required for coherent thinking. Show very imally effective or ineffective or ineffective.	Examination  Idea required for attaining a with evidence of original ions. Apply highly effective ment with broad range of ruired for attaining at least gical thinking, and ability to skills. Writings mostly deattaining most of the cours, and ability to apply know indicate informed, intellectanting some of the course allytical and critical abilities organizational skills. Writings to apply writings the course learning the	Dec May  all the course learning thought, and ability to a organizational skills. relevant concepts.  It most of the course to apply knowledge to apply knowledge to apply knowledge to apply knowledge to monstrate informed, se learning outcomes. ledge to most familiar ctual engagement with the learning outcomes. Show limited ability rittings indicate some ang outcomes. Lack of the knowledge to solve
(and Co-requisites and Impermissible combination)  Offer in 2014 - 2015  Offer in 2015 - 2016  Course Grade  Grade Descriptors	6. Know so NIL  Y 1st s Y A+ to F  A B C D Fail	Demonstrate thorough mastery at an adva outcomes. Show strong analytical and critia apply knowledge to a wide range of compl. Writings consistently demonstrate informed.  Demonstrate substantial command of a the learning outcomes. Show evidence of anal familiar and some unfamiliar situations, thoughtful intellectual engagement with brown brown of the properties of the original problems. Apply moderately effective orga concepts or theories but not always with submonstrate partial but limited command Show evidence of some coherent and logion to apply knowledge to solve problems. A intellectual engagement with concepts or the Demonstrate little or no evidence of command strate partial abilities, logical and problems. Organizational skills are minimal problems. Organizational skills are minimal problems.	nced level of extensive knowled cal abilities and logical thinking, ex, familiar and unfamiliar situat d, thoughtful intellectual engage proad range of knowledge required and critical abilities and logical thinking had range of relevant concepts. In and of knowledge required for cical abilities and logical thinking nizational skills. Writings mostly ufficient depth, breadth or under of knowledge required for attical thinking, but with limited an apply limited or barely effective neories but mostly at a superficiand of knowledge required for coherent thinking. Show very imally effective or ineffective or ineffective.	Examination  Idea required for attaining a with evidence of original ions. Apply highly effective ment with broad range of ruired for attaining at least gical thinking, and ability to skills. Writings mostly deattaining most of the cours, and ability to apply know indicate informed, intellectanting some of the course allytical and critical abilities organizational skills. Writings to apply writings the course learning the	Dec May  all the course learning thought, and ability to a organizational skills. relevant concepts.  It most of the course to apply knowledge to apply knowledge to apply knowledge to apply knowledge to monstrate informed, se learning outcomes. ledge to most familiar ctual engagement with the learning outcomes. Show limited ability rittings indicate some ang outcomes. Lack of the knowledge to solve
(and Co-requisites and impermissible combination)  Offer in 2014 - 2015  Offer in 2015 - 2016  Course Grade  Grade Descriptors  Course Type  Course Teaching	6. Know so NIL  Y 1st s Y A+ to F  A B C D Fail	Demonstrate thorough mastery at an adva outcomes. Show strong analytical and critiapply knowledge to a wide range of compl. Writings consistently demonstrate informed.  Demonstrate substantial command of a learning outcomes. Show evidence of anal familiar and some unfamiliar situations. thoughtful intellectual engagement with brown between the properties of the properti	nced level of extensive knowled cal abilities and logical thinking, ex, familiar and unfamiliar situat d, thoughtful intellectual engage proad range of knowledge required and critical abilities and logical thinking had range of relevant concepts. In and of knowledge required for cical abilities and logical thinking nizational skills. Writings mostly ufficient depth, breadth or under of knowledge required for attical thinking, but with limited an apply limited or barely effective neories but mostly at a superficiand of knowledge required for coherent thinking. Show very imally effective or ineffective or ineffective.	Examination  Idea required for attaining a with evidence of original ions. Apply highly effective ment with broad range of ruired for attaining at least gical thinking, and ability to skills. Writings mostly deattaining most of the cours, and ability to apply know indicate informed, intellectanting some of the course allytical and critical abilities organizational skills. Writings to apply writings the course learning the	Dec May  all the course learning thought, and ability to a organizational skills. relevant concepts.  It most of the course to apply knowledge to apply knowledge to apply knowledge to apply knowledge to monstrate informed, se learning outcomes. ledge to most familiar ctual engagement with the learning outcomes. Show limited ability rittings indicate some ang outcomes. Lack of the knowledge to solve
(and Co-requisites and impermissible combination)  Offer in 2014 - 2015  Offer in 2015 - 2016  Course Grade  Grade Descriptors  Course Type  Course Teaching	6. Know so NIL  Y 1st s Y A+ to F  A  B  C  D  Fail	Demonstrate thorough mastery at an adva outcomes. Show strong analytical and critiapply knowledge to a wide range of compl. Writings consistently demonstrate informed.  Demonstrate substantial command of a learning outcomes. Show evidence of anal familiar and some unfamiliar situations. thoughtful intellectual engagement with brown between the properties of the properti	nced level of extensive knowled cal abilities and logical thinking, ex, familiar and unfamiliar situat d, thoughtful intellectual engage proad range of knowledge requitical and critical abilities and logical thinking and range of relevant concepts. In and of knowledge required for ical abilities and logical thinking nizational skills. Writings mostly ufficient depth, breadth or under of knowledge required for attractional skills, but with limited an Apply limited or barely effective neories but mostly at a superficient of knowledge required for action of knowledge required for coherent thinking. Show very consulty effective or in the consultance of the consultance of the coherent thinking. Show very consultance is the consultance of the coherent thinking. Show very consultance is the consultance of the coherent thinking. Show very consultance is the coherent thinking. Show very consultance is the coherent thinking.	Examination  Idea required for attaining a with evidence of original ions. Apply highly effective ment with broad range of ruired for attaining at least gical thinking, and ability to skills. Writings mostly deattaining most of the cours, and ability to apply know indicate informed, intellectanting some of the course allytical and critical abilities organizational skills. Writings to apply writings the course learning the	Dec May  all the course learning thought, and ability to e organizational skills. relevant concepts.  It most of the course to apply knowledge to emonstrate informed, see learning outcomes. ledge to most familiar stual engagement with e learning outcomes. Show limited ability ritings indicate some ang outcomes. Lack of y knowledge to solve sence of intellectual
(and Co-requisites and impermissible combination)  Offer in 2014 - 2015  Offer in 2015 - 2016  Course Grade  Grade Descriptors  Course Type  Course Teaching	6. Know so NIL  Y 1st s Y A+ to F  A B C D Fail Lecture-ba Activities	Demonstrate thorough mastery at an adva outcomes. Show strong analytical and critiapply knowledge to a wide range of compl. Writings consistently demonstrate informed.  Demonstrate substantial command of a learning outcomes. Show evidence of anal familiar and some unfamiliar situations. thoughtful intellectual engagement with brown between the properties of the properti	nced level of extensive knowled cal abilities and logical thinking, ex, familiar and unfamiliar situat d, thoughtful intellectual engage proad range of knowledge requitical and critical abilities and logical thinking and range of relevant concepts. In and of knowledge required for ical abilities and logical thinking nizational skills. Writings mostly ufficient depth, breadth or under of knowledge required for attractional skills, but with limited an Apply limited or barely effective neories but mostly at a superficient of knowledge required for action of knowledge required for coherent thinking. Show very consulty effective or in the consultance of the consultance of the coherent thinking. Show very consultance is the consultance of the coherent thinking. Show very consultance is the consultance of the coherent thinking. Show very consultance is the coherent thinking. Show very consultance is the coherent thinking.	Examination  Idea required for attaining a with evidence of original ions. Apply highly effective ment with broad range of ruired for attaining at least gical thinking, and ability to skills. Writings mostly deattaining most of the cours, and ability to apply know indicate informed, intellectanting some of the course allytical and critical abilities organizational skills. Writings to apply writings the course learning the	Dec May  all the course learning thought, and ability to be organizational skills. The course to apply knowledge to apply knowledge to apply knowledge to most familiar stual engagement with the learning outcomes. Show limited ability ritings indicate some and outcomes. Lack of y knowledge to solve sence of intellectual
(and Co-requisites and Impermissible combination)  Offer in 2014 - 2015  Offer in 2015 - 2016  Course Grade  Grade Descriptors  Course Type  Course Teaching	6. Know so NIL  Y 1st s Y A+ to F  A B C D Fail Lecture-ba Activities Lectures Tutorials	Demonstrate thorough mastery at an adva outcomes. Show strong analytical and critiapply knowledge to a wide range of compl. Writings consistently demonstrate informed.  Demonstrate substantial command of a learning outcomes. Show evidence of anal familiar and some unfamiliar situations. thoughtful intellectual engagement with brown between the properties of the properti	nced level of extensive knowled cal abilities and logical thinking, ex, familiar and unfamiliar situat d, thoughtful intellectual engage proad range of knowledge requitical and critical abilities and logical thinking and range of relevant concepts. In and of knowledge required for ical abilities and logical thinking nizational skills. Writings mostly ufficient depth, breadth or under of knowledge required for attractional skills, but with limited an Apply limited or barely effective neories but mostly at a superficient of knowledge required for action of knowledge required for coherent thinking. Show very consulty effective or in the consultance of the consultance of the coherent thinking. Show very consultance is the consultance of the coherent thinking. Show very consultance is the consultance of the coherent thinking. Show very consultance is the coherent thinking. Show very consultance is the coherent thinking.	Examination  Idea required for attaining a with evidence of original ions. Apply highly effective ment with broad range of ruired for attaining at least gical thinking, and ability to skills. Writings mostly deattaining most of the cours, and ability to apply know indicate informed, intellectanting some of the course allytical and critical abilities organizational skills. Writings to apply writings the course learning the	Dec May  all the course learning thought, and ability to e organizational skills. relevant concepts to apply knowledge to emonstrate informed, see learning outcomes. ledge to most familiar stual engagement with e learning outcomes. Show limited ability ritings indicate some ing outcomes. Lack of y knowledge to solve sence of intellectual  No. of Hours  36
(and Co-requisites and Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade	6. Know so NIL  Y 1st s Y A+ to F  A B C D Fail Lecture-ba Activities Lectures Tutorials	Demonstrate thorough mastery at an adva outcomes. Show strong analytical and critiapply knowledge to a wide range of compl. Writings consistently demonstrate informed.  Demonstrate substantial command of a learning outcomes. Show evidence of anal familiar and some unfamiliar situations. thoughtful intellectual engagement with brown between the properties of the properti	nced level of extensive knowled cal abilities and logical thinking, ex, familiar and unfamiliar situat d, thoughtful intellectual engage proad range of knowledge requitical and critical abilities and logical thinking and range of relevant concepts. In and of knowledge required for ical abilities and logical thinking nizational skills. Writings mostly ufficient depth, breadth or under of knowledge required for attractional skills, but with limited an Apply limited or barely effective neories but mostly at a superficient of knowledge required for action of knowledge required for coherent thinking. Show very consulty effective or in the consultance of the consultance of the coherent thinking. Show very consultance is the consultance of the coherent thinking. Show very consultance is the consultance of the coherent thinking. Show very consultance is the coherent thinking. Show very consultance is the coherent thinking.	Examination  In the second of the course of	Dec May  all the course learning thought, and ability to e organizational skills. relevant concepts.  It most of the course to apply knowledge to emonstrate informed, see learning outcomes. ledge to most familiar stual engagement with e learning outcomes. Show limited ability ritings indicate some ing outcomes. Lack of y knowledge to solve sence of intellectual  No. of Hours  36
(and Co-requisites and Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade Grade Descriptors  Course Type Course Teaching & Learning Activities	6. Know so NIL  Y 1st s Y A+ to F  A  B  C  D  Fail  Lecture-ba  Activities Lectures Tutorials Reading /	Demonstrate thorough mastery at an adva outcomes. Show strong analytical and critiapply knowledge to a wide range of compl. Writings consistently demonstrate informed.  Demonstrate substantial command of a learning outcomes. Show evidence of anal familiar and some unfamiliar situations. thoughtful intellectual engagement with broughtful intellectual engagement with some evidence of some analytical and critisituations. Apply moderately effective orga concepts or theories but not always with su Demonstrate partial but limited command Show evidence of some coherent and log to apply knowledge to solve problems. A intellectual engagement with concepts or the Demonstrate partial but limited command Show evidence of some coherent and log to apply knowledge to solve problems. A intellectual engagement with concepts or the orient of commanalytical and critical abilities, logical and problems. Organizational skills are min engagement with concepts or theories. Wr used course	nced level of extensive knowled cal abilities and logical thinking, ex, familiar and unfamiliar situat di, thoughtful intellectual engage proad range of knowledge required and critical abilities and logical thinking had range of relevant concepts. In an	Examination  In the second of the course of	Dec May  all the course learning thought, and ability to a organizational skills. relevant concepts. to apply knowledge to apply knowledge to apply knowledge to the monstrate informed, are learning outcomes. It is selevant of a most familiar atual engagement with the learning outcomes. So show limited ability ritings indicate some and outcomes. Lack of y knowledge to solve sence of intellectual to the learning outcomes. The learning outcomes are solved in the learning outcomes. The learning outcomes are solved in the learning outcomes. The learning outcomes are solved in the learning outcomes. The learning outcomes are solved in the learning outcomes. The learning outcomes are solved in the learning outcomes. The learning outcomes are solved in the learning outcomes. The learning outcomes are solved in the learning outcomes. The learning outcomes are solved in the learning outcomes. The learning outcomes are solved in the learning outcomes. The learning outcomes are solved in the learning outcomes. The learning outcomes are solved in the learning outcomes. The learning outcomes are solved in the learning outcomes. The learning outcomes are solved in the learning outcomes. The learning outcomes are solved in the learning outcomes are solved in the learning outcomes. The learning outcomes are solved in the learning outcomes are solved in the learning outcomes. The learning outcomes are solved in the learning outcomes are solved in the learning outcomes. The learning outcomes are solved in the learning outcomes. The learning outcomes are solved in the learning outcomes are solved in the learning outcomes. The learning outcomes are solved in the learning outcomes are solved in the learning outcomes. The learning outcomes are solved in the learning outcomes are solved in the learning outcomes. The learning outcomes are solved in the learning outcomes are solved in the learning outcomes.

Offering Department	Biological S	Sciences		Quota	80	
Course Co-ordinator		nyk, Biological Sciences (dvornyk@i	hku.hk)			
Teachers Involved		nyk, Biological Sciences	<b>,</b>			
Course Objectives	To introduc	To introduce students to the diversity and function of microorganisms; and relate this to their importance in the natural environment, disease and public health, food production and spoilage and the biotechnology industry.				
Course Contents & Topics	genetics; I animals a	Evolutionary diversity of bacteria, archaea, eukarya and viruses; Metabolic strategies, cell biology and genetics; Microbial ecology, marine microbiology, terrestrial microbiology; Microbial interactions with animals and plants; The human microbiome; Medical microbiology and immunology; Biotechnology applications; Food spoilage and food fermentations.				
Course Learning Outcomes	On succes	sful completion of this course, stude	ents should be able to:			
	<ul><li>2. Explain and compa</li><li>3. Identify</li></ul>	Describe the key features of the major microbial phyla and place them in an evolutionary context.     Explain the major physiological and genetic processes in prokaryotes and eukaryotic microorganisms and compare the similarities and differences between these two domains.     Identify the microorganisms involved and their role in ecological processes, human disease and medicine, food production and spoilage, and biotechnology.				
Pre-requisites (and Co-requisites and Impermissible combination)	NIL					
Offer in 2014 - 2015	Y 1st s	sem		Examination	Dec	
Offer in 2015 - 2016	Υ				<u>'</u>	
Course Grade	A+ to F					
Grade Descriptors	A (85-100%) Meets the standard of excellence. All criteria are addressed. Organization of ideas and clarity are excellent. Additional reading or research is evident. Ideas show an exceptional understanding of concepts. Arguments are highly persuasive and show excellent judgment and prioritization of issues. Presentation is highly creative and appealing.					
	В	(70-84%) Approaches the standard of excellence. All criteria are addressed. Organization of ideas and clarity are very good. Ideas show a complete understanding of concepts. Arguments are persuasive and prioritize major issues. Presentation is creative and appealing.				
	С	(55-69%) Meets an acceptable standard. All criteria are addressed. Organization of ideas and clarity are sufficient. Ideas show an effective understanding of concepts. Arguments identify major issues. Presentation is appealing but may lack clarity.				
	_	(45-54%) Below acceptable standard. Most criteria are addressed. Organization of ideas and clarity are weak. Ideas show an incomplete understanding of concepts. Arguments are not persuasive. Presentation lacks creativity or is not appealing.				
	D	show an incomplete understanding of con-				
	Fail	show an incomplete understanding of con-	cepts. Arguments are not pe major criteria. Very weak o	rsuasive. Presentation la	acks creativity or is not clarity. Ideas show a	
Course Type	Fail	show an incomplete understanding of con- appealing.  (<45%) Unacceptable. Inability to identify	cepts. Arguments are not pe major criteria. Very weak o	rsuasive. Presentation la	acks creativity or is not clarity. Ideas show a	
Course Teaching	Fail	show an incomplete understanding of con- appealing.  (<45%) Unacceptable. Inability to identify lack of understanding of concepts. No coh- th laboratory component course	cepts. Arguments are not pe major criteria. Very weak o	rsuasive. Presentation la	acks creativity or is not clarity. Ideas show a	
Course Teaching	Fail Lecture wit	show an incomplete understanding of con- appealing.  (<45%) Unacceptable. Inability to identify lack of understanding of concepts. No coh- th laboratory component course	cepts. Arguments are not pe major criteria. Very weak or erent argument. Presentation	rsuasive. Presentation la	cks creativity or is not clarity. Ideas show a appealing.	
Course Teaching	Fail Lecture wit	show an incomplete understanding of con- appealing.  (<45%) Unacceptable. Inability to identify lack of understanding of concepts. No coh- th laboratory component course	cepts. Arguments are not pe major criteria. Very weak or erent argument. Presentation	rsuasive. Presentation la	clarity. Ideas show a appealing.  No. of Hours	
Course Teaching	Fail Lecture wit Activities Lectures	show an incomplete understanding of con- appealing.  (<45%) Unacceptable. Inability to identify lack of understanding of concepts. No coh- th laboratory component course	cepts. Arguments are not pe major criteria. Very weak or erent argument. Presentation	rsuasive. Presentation la	cks creativity or is not clarity. Ideas show a appealing.  No. of Hours	
Course Teaching	Fail  Lecture with Activities Lectures Laborator Tutorials	show an incomplete understanding of con- appealing.  (<45%) Unacceptable. Inability to identify lack of understanding of concepts. No coh- th laboratory component course	cepts. Arguments are not pe major criteria. Very weak or erent argument. Presentation	rsuasive. Presentation la	clarity. Ideas show a appealing.  No. of Hours  24	
Course Teaching & Learning Activities  Assessment Methods	Fail  Lecture with Activities Lectures Laborator Tutorials	show an incomplete understanding of con- appealing.  (<45%) Unacceptable. Inability to identify lack of understanding of concepts. No coh th laboratory component course	cepts. Arguments are not pe major criteria. Very weak or erent argument. Presentation	rsuasive. Presentation la rganization of ideas and lacks creativity or is un	clarity. Ideas show a appealing.  No. of Hours  24  24	
Course Teaching & Learning Activities  Assessment Methods	Fail  Lecture with Activities Lectures Laborator Tutorials Reading /	show an incomplete understanding of con- appealing.  (<45%) Unacceptable. Inability to identify lack of understanding of concepts. No coh- th laboratory component course  Self study	cepts. Arguments are not pe major criteria. Very weak or erent argument. Presentation  Details	rsuasive. Presentation la rganization of ideas and lacks creativity or is un	clarity. Ideas show a appealing.  No. of Hours 24 24 6 100 Weighting in final	
Course Teaching & Learning Activities  Assessment Methods	Fail  Lecture with Activities Lectures Laborator Tutorials Reading / Methods	show an incomplete understanding of con- appealing.  (<45%) Unacceptable. Inability to identify lack of understanding of concepts. No coh th laboratory component course  Self study	cepts. Arguments are not pe major criteria. Very weak or erent argument. Presentation  Details	rsuasive. Presentation la rganization of ideas and lacks creativity or is un	No. of Hours  No. of Hours  24  24  6  100  Weighting in final course grade (%)	
Course Type Course Teaching & Learning Activities  Assessment Methods and Weighting  Required/recommended reading and online materials	Fail  Lecture with Activities Lectures Laborator Tutorials Reading / Methods  Examinati Laborator	show an incomplete understanding of con- appealing.  (<45%) Unacceptable. Inability to identify lack of understanding of concepts. No coh th laboratory component course  Self study  on y reports  ogy of Microorganisms, Pearson I	major criteria. Very weak or erent argument. Presentation  Details  Details	rganization of ideas and lacks creativity or is un	No. of Hours  No. of Hours  24  24  6  100  Weighting in final course grade (%)	

<b>BIOL1201 Introduction</b>	to food and nutrition (6 credits)	Academic Year	2014
Offering Department	Biological Sciences	Quota	110
Course Co-ordinator	Prof N P Shah, Biological Sciences (npshah@hku.hk)		
Teachers Involved	Dr E T S Li, Biological Sciences Dr J W F Wan, Biological Sciences Prof N P Shah, Biological Sciences		
Course Objectives	To enable student to appreciate the multidisciplinary nature farmer's field to the dinner table, a basic understanding of for covered. Food safety, food selection behaviour as well instrumental to good health will be discussed.  This is an independent course which can be taken by students for further studies in Food and Nutritional Science.	ood production, processing a as balanced nutrition as	and storage will be part of life style
	Stadente for farther stadies in 1 cod and Mathtenial Colonice.		

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.				processed foods;	
Course Learning Outcomes	On successful completion of this course, students should be able to:  1. Understand the key components of food and be able to discuss their functional properties.  2. Understand the significance of food safety and be able to identify sources of contamination.  3. Understand the concept of a balanced diet.  4. Critically assess and identify quack or fad diets.					
Pre-requisites (and Co-requisites and Impermissible combination)	NIL					
Offer in 2014 - 2015	Y 1st	Y 1st sem Examination Dec				
Offer in 2015 - 2016	Υ					
Course Grade	A+ to F					
Grade Descriptors	Α	Demonstrate thorough grasp of the subject integrate knowledge. Demonstrate highly effe			ticulate concepts and	
	В	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.					
	D 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 retentic understand concepts and show minimal comskills.				
Course Type	Lecture-b	ased course				
Course Teaching	Activitie	s	Details		No. of Hours	
& Learning Activities	Lectures				36	
	Tutorials		student-centered lear	rning	12	
	Reading	/ Self study			100	
Assessment Methods and Weighting	Methods	3	Details		Weighting in final course grade (%)	
	Assignm	ents			20	
	Examina	tion			60	
	Test				20	
Required/recommended reading and online materials	Fenema ( Brown A.	Hotchkiss J.H. & Porter N.N. Food Science. Chapman & Hall, 1995 Fenema O.R. Food Chemistry. Marcel Dekker, 1996 Brown A. Understanding Food: Principles and Preparation. Wadsworth, Cengage Learning, 2011 Whitney E. & Rolfes S.R. Understanding Nutrition. Wadsworth, Cengage Learning, 2011				
Course Website	http://mod	odle.hku.hk/				

<b>BIOL1309 Evolutionary div</b>	versity (6 credits)	Academic Year	2014	
Offering Department	Biological Sciences	Quota	105	
Course Co-ordinator	Prof R M K Saunders, Biological Sciences (saunders@hk	u.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 resulted in fundamental changes in our understanding evolutionary trees will be used as the basis for a survey of for understanding how structures, processes and behavior	g of evolutionary history (phy of different groups in phylogenet	logeny). Current tic sequence, and	
Course Contents & Topics	Introduction to the methodology for reconstructing the sequence of past evolutionary events (cladistics) algae (Rhodophyta, Phaeophyta and Chlorophyta); non-vascular plants (Hepatophyta, Anthocerophyta and Bryophyta); seedless vascular plants (Lycophyta, Psilophyta, Sphenophyta and Pterophyta); seed plants (Cycadophyta, Ginkgophyta, Coniferophyta, Gnetophyta and Anthophyta); invertebrates (Cnidaria Platyhelminthes, Annelida, Mollusca, Nematoda, Arthropoda and Echinodermata); fish (Chondrichthyes and Actinopterygii); amphibians (Batrachomorpha); reptiles (Anapsida, Lepidosauromorpha and Archosauromorpha); and mammals (Monotremata, Metatheria and Eutheria).			
Course Learning Outcomes	On successful completion of this course, students should 1. Interpret phylogenies in order to understand the relat evolutionary changes in structures, processes and behavi 2. Describe the characteristics of different evolutionary names of the main taxonomic groups.  3. Explain the possible selective advantages of the highlig	tedness of taxonomic groups a lours. Iineages of plants and animal	ls and recall the	

Pre-requisites (and Co-requisites and Impermissible combination)	NIL				
Offer in 2014 - 2015	Y 2n	d sem		Examination	May
Offer in 2015 - 2016	Υ	Y			
Course Grade	A+ to F	A+ to F			
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 extensive use of named examples. Show evidence of significant critical abilities and logical thinking. Apply highly effective presentation skills.				
	В	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.			
	С	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 commo outcomes, without use of named examples Presentational skills are minimally effective o	s. Show little or no evide		
Course Type	Lecture v	vith laboratory component course			
Course Teaching	Activitie	es	Details		No. of Hours
& Learning Activities	Lectures	:			24
	Laboratory				36
	Reading / Self study				100
Assessment Methods and Weighting	Method	S	Details		Weighting in final course grade (%)
	Examina	ition			70
	Laborato	ory reports			30
Required/recommended reading and online materials		ven, R. F. Evert & S. E. Eichhorn: Biolog ppert & R. D. Barnes: Invertebrate Zoolo			rk, 2005, 7th ed.)
Course Website	http://ww	w.biosch.hku.hk/ecology/lsc/			

BIOL1501 Bioethics (6 cre	dits)		Academic Year	2014	
Offering Department	Biological	Sciences	Quota	40	
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 aim is	to explore the ethical implications of the latest major adv	ances in biology and m	edicine.	
Course Contents & Topics	major adva limited to: dying, env	he course will discuss research ethic between student and mentor, and ethical implications in rece hajor advancements in biological and medical sciences. Major areas to be discussed include but are n mited to: genetics, reproduction, disease diagnosis and therapy, development, transplantation, aging ying, environment, and the use of animals in research. Ethical and moral principles and implications for ocial framework and public policy raised by these advances will be discussed.			
Course Learning Outcomes	Familia bioethics s     Reflect understand     Underst	esful completion of this course, students should be able to rize with the current ethical theories, discussions, and specifically related to the advancement of modern molecu- upon and formulate in a professional manner their own of d and enter into a respectful dialogue with those who pos- tand the basis of one's own position, as well as the basis of the the quandaries that arise when facing modern medical	arguments taking plac lar biology and genomi opinions on these matt sess another point of v of another person's opi	cs. ers as well as to ew. nion.	
Pre-requisites (and Co-requisites and Impermissible combination)	NIL				
Offer in 2014 - 2015	N		Examination		
Offer in 2015 - 2016	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 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	B Demonstrate substantial grasp of the subject matter covered. Show evidence of analytical and critical abilities and logical thinking with some evidence of competence in professional-level problem solving. Use communication skills and techniques and analysis of data and results to draw generally appropriate conclusions to real-world problems. Demonstrate effective individual as well as collaborative-based organizational and presentational skills.			
			nizational and presentational	skills.	

	С	communication skills and techniques and an	n limited competence in professional-level alysis of data and results to draw moderately a ms. Demonstrate moderately individual as we	ppropriate but sometimes	
	D	Show some evidence of coherent and logica Use communication skills and techniques ar	retention of some relevant information, of the il thinking, but lacking competence in professio danalysis of data and results to draw sometin s. Demonstrate individual as well as collabora ess.	nal-level problem solving. mes appropriate but often	
	Fail	Demonstrate little or no grasp, with retention of little relevant information, of the subject matter co- coherent and logical thinking, and minimal competence in professional-level problem solving. Use skills and techniques and analysis of data and results ineffectively, leading generally to inapput erroneous conclusions to real-world problems. Demonstrate ineffectiveness individual as well as organizational and presentational skills.			
Course Type	Lecture-ba	ased course			
Course Teaching & Learning Activities	Activitie	s	Details	No. of Hours	
a Learning Activities	Lectures			36	
	Tutorials			12	
	Assessment			100	
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	
	Assignme	ents	continuous assessment of essays, presentation and debate exercises	60	
	Examina	tion		40	
Required/recommended reading and online materials	NIL Library &	web-based reading materials			
Additional Course Information	This cours	se will be offered subject to a minimum	enrollment number and availability of	teachers.	

- '	dits)		Academic Year	2014
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	human ger quality of I with. The	tive is to expose students to the impacts of genes to nome and many agricultural crops and animals genome ife as well as lots of technical and ethical issues/chall goal of this course is to open up students from all back gene and its impact on various scientific and social discipance.	es, it brings not only pror enges that general pub grounds to this basic u	nises of a bette lic need to dea
Course Contents & Topics	Introduction Basic gene Basic Mole Bacterial G Human Ge Human Ge Genes and Genes and Genes and Genes and Genes and		nd cloning	
Course Learning Outcomes	1. Demons 2. Gain de	sful completion of this course, students should be able to strate understanding and to explain the principle of inherities op understanding about the advancement of biotechnologue and explain the benefits and shortcomings of the app	itance, recombinant DN	· ·
	NIL			
(and Co-requisites and		dents with level 3 or above in HKDSE Biology or Combi	ined Science with Biolog	gy component o
and Co-requisites and mpermissible combination)	Not for stu	•	ined Science with Biolog	gy component o
(and Co-requisites and Impermissible combination) Offer in 2014 - 2015	Not for stue	•		
(and Co-requisites and Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016	Not for stue equivalent.	•		,
Pre-requisites (and Co-requisites and Impermissible combination)  Offer in 2014 - 2015  Offer in 2015 - 2016  Course Grade  Grade Descriptors	Not for studequivalent.  N Y	•	Examination  strong analytical and critical rofessional-level problem sol lits to draw appropriate and in	abilities and logical ving. Critically use sightful conclusions

	С	critical abilities and logical thinking wi communication skills and techniques and a	o of the subject matter covered. Show some eventh limited competence in professional-level nalysis of data and results to draw moderately alems. Demonstrate moderately individual as we	problem solving. Use propriate but sometimes
	D	Show some evidence of coherent and logic Use communication skills and techniques a	n retention of some relevant information, of the al thinking, but lacking competence in profession and analysis of data and results to draw sometin ms. Demonstrate individual as well as collaboratess.	nal-level problem solving. nes appropriate but often
	Fail	coherent and logical thinking, and minimal skills and techniques and analysis of data	n of little relevant information, of the subject mati competence in professional-level problem solv and results ineffectively, leading generally to in ms. Demonstrate ineffectiveness individual as we	ring. Use communication nappropriate and usually
Course Type	Lecture-b	ased course		
Course Teaching	Activitie	es .	Details	No. of Hours
& Learning Activities	Lectures			36
	Tutorials			12
	Reading	/ Self study	including 45 hours on 15 essay/report writing, 30 presentation (include preparation)	93
Assessment Methods and Weighting	Methods	5	Details	Weighting in final course grade (%)
	Assignm	ents	discussion forum	35
	Essay		essays & written reports	25
	Presenta	ation	poster & oral presentation	30
	Test		in-class participation & quizzes	10
Required/recommended reading and online materials	Library &	Library & web-based reading materials		

BIOL2102 Biostatistics (6	credits)		Academic Year	2014		
Offering Department	Biological	Sciences	Quota	135		
Course Co-ordinator	Dr G Pana	agiotou, Biological Sciences (gipa@hku.hk)				
Teachers Involved	Dr G Pana	agiotou, Biological Sciences				
Course Objectives	students 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	Introduction to Statistics; Describing, Exploring and Comparing Data; Probability; Probability Distributions; Normal Probability Distribution; Relations between Distributions; Interval estimation; Hypothesis Testing; Correlation and Regression; Statistical tests; Non-Parametric Inference.				
Course Learning Outcomes	1. Formula 2. Design 3. Make q 4. Use R 1 5. Unders 6. Use Vir	On successful completion of this course, students should be able to:  1. Formulate biological questions into statistical questions. 2. Design experiments effectively. 3. Make quantitative estimation of biologically meaningful parameters. 4. Use R to carry out some of the statistical computations. 5. Understand the assumptions of commonly used statistical methods. 6. Use Virtual Laboratories for Next Generation Sequencing experiments. 7. Evaluate critically the medical literature.				
Pre-requisites (and Co-requisites and Impermissible combination)		BIOC1600 Perspectives in biochemistry or BIOL1110 Fr and evolution or ENVS1301 Environmental life science				
Offer in 2014 - 2015	Y 2nd	sem	Examination	May		
Offer in 2015 - 2016	Υ					
Course Grade	A+ to F					
Grade Descriptors	A	Demonstrate thorough grasp of the subject and skills required for atts strong analytical and critical abilities and logical thinking, with evide computational skills and techniques for basic statistical analyses. Be to draw appropriate and insightful conclusions. Apply highly effective or	nce of original thought. A able to critically use data	Apply highly effective and statistical results		
	B Demonstrate substantial grasp of the subject and skills required for attaining at least most of the course learning outcomes. Present evidence of analytical and critical abilities and logical thinking. Apply effective computational skills and techniques for basic statistical analyses. Be able to correctly use data and statistical results to draw appropriate conclusions. Apply effective organizational and presentational skills.					
	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 drapresentational skills.	aw appropriate conclusions. Apply mode	erately effective organizational and
	D	Demonstrate partial and limited grasp o outcomes. Present evidence of some con Apply limited or barely effective compulimited ability to use data and statistical organizational and presentational skills.	pherent and logical thinking, but with lin tational skills and techniques for basic	nited analytical and critical abilities. c statistical analyses. Demonstrate
	Fail	Demonstrate evidence of little or no gras outcomes. Present evidence of little or minimally effective or ineffective compu misuse of data and statistical results ar ineffective organizational and presentation	ack of analytical and critical abilities, lo tational skills and techniques for basion d/or unable to draw appropriate conclu	ogical and coherent thinking. Apply statistical analyses. Demonstrate
Course Type	Lecture-based course			
Course Teaching & Learning Activities	Activities		Details	No. of Hours
a Learning Activities	Lectures			36
	Tutorials		including projects	24
	Reading / Self study			100
Assessment Methods and Weighting	Methods	3	Details	Weighting in final course grade (%)
	Assignments			50
	Examination			50
Required/recommended reading and online materials	Zar, J. H.	Biostatistical Analysis (Prentice-Ha	ll / Englewood Cliffs, N.J., 1999,	4th edition)
Course Website	http://mod	odle.hku.hk/		

Offering Department		atory course (6 credits)	Academic Year	2014		
Oncoming Department	Biological S	Sciences	Quota	215		
Course Co-ordinator	Dr W Y Lui	Dr W Y Lui, Biological Sciences (wylui@hku.hk)				
Teachers Involved	Prof B K C	, Biological Sciences Chow, Biological Sciences Biological Sciences				
Course Objectives	biological	The objective is to provide students a comprehensive training in basic laboratory techniques used in modern biological studies. The course will cover a number of techniques used by molecular biologists and microbiologists to conduct scientific research.				
Course Contents & Topics	This course	e will be divided into three modules and each module w	vill have 3 laboratory ses	sions.		
		e: Nucleic acid analysis A isolation, spectrometry, gel electrophoresis, restric	tion enzyme analysis ar	nd DNA sequence		
	Module two: Protein analysis Centrifugation, chromatography and SDS-PAGE electrophoresis.					
	Module three: Microbiology Microscopy, observation of microorganisms and staining of bacteria, isolation of pure cultures by streaking and serial dilution, enumeration of microbial cells by Petroff-Hausser counting chamber, and turbidity. Identification and classification of microbes from natural source and statistical analysis.					
Course Learning Outcomes		sful completion of this course, students should be able				
	<ol> <li>Demons setting.</li> <li>Master s</li> <li>Understand</li> </ol>	trate knowledge in proper use of simple research equip trate knowledge and understanding of how and why ome basic laboratory techniques for carrying out exper and the different ways that microorganisms were ca	certain techniques are uriments.			
	00.00. 0	response to dye etc. and how they were counted.				
Pre-requisites (and Co-requisites and Impermissible combination)		DL1110 From molecules to cells				
(and Co-requisites and mpermissible combination)		DL1110 From molecules to cells	Examination	Dec May		
(and Co-requisites and Impermissible combination) Offer in 2014 - 2015	Pass in BIC	DL1110 From molecules to cells	Examination	Dec May		
(and Co-requisites and Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016	Pass in BIC	DL1110 From molecules to cells	Examination	Dec May		
(and Co-requisites and Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade	Pass in BIC  Y 1st s	DL1110 From molecules to cells	ive knowledge required for at nd logical thinking, with eviden data and results to draw app	taining all the course		
(and Co-requisites and	Pass in BIO  Y 1st s  Y  A+ to F	DEMONSTRATE thorough mastery at an advanced level of extensi learning outcomes. Show strong analytical and critical abilities ar Apply highly effective lab skills and techniques. Critical use of a	ive knowledge required for at and logical thinking, with eviden data and results to draw app nal skills. ge required for attaining at lea and logical thinking. Apply e	taining all the course ce of original thought ropriate and insightful list most of the course fective lab skills and		

		and techniques. Mostly correct but some moderately effective organizational and p	e erroneous use of data and results to draw appropresentational skills.	priate conclusions. Apply		
	D	Evidence of some coherent and logical th	d of knowledge required for attaining some of the coninking, but with limited analytical and critical abilities on use data and results to draw appropriate conclusional skills.	s. Apply partially effective		
	Fail	Demonstrate little or no evidence of command of knowledge required for attaining the course learning ou Evidence of little or lack of analytical and critical abilities, logical and coherent thinking. Apply minimally effi- ineffective lab skills and techniques. Misuse of data and results and/or unable to draw appropriate condocranization and presentational skills are minimally effective or ineffective.				
Course Type	Laborato	Laboratory and workshop course				
Course Teaching	Activities		Details	No. of Hours		
& Learning Activities	Laborat	ory	11 laboratory sessions (4 hours each)	44		
	Tutorials		lecture/tutorials	18		
	Reading	g / Self study		100		
Assessment Methods and Weighting	Method	ls	Details	Weighting in final course grade (%)		
	Laborat	ory reports		60		
	Test		1 hour final examination	40		
Course Website	http://mo	oodle.hku.hk/				
Additional Course Information	Lab A or Quota 13	Quota 80 - 1st Semester Lab A on Wed. with 40 students and Lab. B on Thurs. with 40 students Quota 135 - 2nd Semester Lab C on Wed. with 25 students; Lab. D on Thurs. with 65 students and Lab. E on Fri. with 45 students				

BIOL2220 Principles of bi	ochemistry	(6 credits)		Academic Year	2014	
Offering Department	Biologica	Sciences		Quota	100	
Course Co-ordinator	Dr C S C	Lo, Biological Sciences (clivelo@hku	.hk)			
Teachers Involved	Dr C S C	Lo, Biological Sciences				
Course Objectives		This course is designed to provide undergraduate (non-biochemistry major) an overview of fundamenta concepts in biochemistry as well as hands-on experience in biochemical techniques.				
Course Contents & Topics	with emp	An introduction to various biomolecules in terms of their structures, functions, syntheses and metabolisms, with emphasis on amino acids, proteins, enzymes, carbohydrates, lipids and nucleic acids. The correlations between their biochemical properties and their roles in various life processes will be illustrated.				
Course Learning Outcomes	On successful completion of this course, students should be able to:					
	2. Unders	<ol> <li>Describe the key structural features of carbohydrates, proteins, lipids and nucleotides.</li> <li>Understand the basic enzyme kinetic properties.</li> <li>Explain how the common sugars, fatty acids and amino acids are metabolized and synthesized in livicells.</li> </ol>				
Pre-requisites (and Co-requisites and Impermissible combination)		IOL1110 From molecules to cells; and udents who have passed in BIOC260		have already enro	lled in this course	
Offer in 2014 - 2015	Y 1st	Y 1st sem Examination Dec			Dec	
Offer in 2015 - 2016	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. Integration of the full range of appropriate theories, principles, evidence and techniques					
	В	Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. General integration of theories, principles, evidence and techniques				
	С	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. Some partial integration of theories, principles, evidence and techniques				
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Limited integration of theories, principles, evidence and techniques				
	Fail	Demonstrate little or no evidence of com- outcomes. Lack of analytical and critical al knowledge to solve problems. Little or no o	bilities, logical and coherent th	ninking. Show very little	or no ability to apply	
Course Type	Lecture w	rith laboratory component course				
Course Teaching	Activitie	s	Details		No. of Hours	
& Learning Activities						

	Laboratory	3 laboratory sessions	24
	Tutorials		12
	Reading / Self study		100
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)
	Examination		60
	Laboratory reports		10
	Test		30
Required/recommended reading and online materials	L.A. Moran, H.R. Horton, K.G. Scrimgeou International Edition)	ır, M.D. Perry: Principles of Biocher	nistry 5th edition (Pearson
Course Website	http://moodle.hku.hk/		

BIOL2306 Ecology and ev	olution (6 c	credits)	Academic Year	2014		
Offering Department	Biological	Sciences	Quota	140		
Course Co-ordinator	Prof D Du	dgeon, Biological Sciences (ddudgeon@hku.hk)				
eachers Involved		dgeon, Biological Sciences Nilliams (Field course component only), Biological S	Sciences			
Course Objectives	order to interaction understan componer	The interaction between organisms and their environment is addressed using an issue-based approach i order to explains how the ecology of plants and animals has been shaped by evolution through interactions with their living and non-living environment. The course also demonstrates how we car understand and explain the significance of what we see in nature using scientific methods. A field cours component provides the opportunity to investigate how the environment influences community composition, biodiversity and adaptive radiation in a variety of habitats.				
course Contents & Topics	they live a influences responsible some bas by physiol biodiversit of popular ecology a describing and the will concludence a visit a variation.	The environment influences organisms profoundly. It affects their present-day ecology (determining what they live and how many can survive there) and, through natural selection acting over past generation influences their form and adaptations. Present day human-induced changes to the environment are a responsible for endangering species and degrading their habitats. This introductory course introdusome basic scientific principles of ecology and evolution, showing how they are linked to the environment by physiological tolerances and evolutionary adaptation which, in turn, lead to specialization and gene biodiversity. Individuals and their interactions will be a major focus of the course together with discuss of population dynamics, community structuring, life histories, and niche dynamics. The principles ecology and evolution resulting from interaction with the environment will also be demonstrated describing the origins of modern humans, including our fossil record and relationship to other prima and the main ecological transformations caused by humans and their environmental impacts. The countil conclude with an account of the importance of biodiversity, and the factors that threaten it globally. Lectures are complemented by a 5-day residential field course during the Reading Week when stude visit a variety of Hong Kong habitats to study their biodiversity, community composition and relationship between organisms and their environment				
ourse Learning Outcomes	On succes	ssful completion of this course, students should be a	able to:			
	ecological 2. Unders adaptatior 3. Unders environme 4. Unders example. 5. Unders	stand how scientific methods (hypotheses, expering and evolutionary processes. It is the basic mechanism of natural selection, and nand generate biodiversity. It is that ecology and behaviour can be interpreted in the property of the ecological factors influencing evolution, at the community ecology and biodiversity of the organisms found there.	how interactions with the end in the light of selective processing the human evolution	essures from the		
Pre-requisites and Co-requisites and mpermissible combination)		BIOL1309 Evolutionary diversity or BIOL1110 ental life science or ENVS1401 Introduction to envir		or ENVS130		
Offer in 2014 - 2015	Y 1st	sem	Examination	Dec		
Offer in 2015 - 2016	Υ					
ourse Grade	A+ to F					
Grade Descriptors	Α	A Evidence of complete or near-complete understanding and a thorough grasp of the subject as demonstrated by attainment of all learning outcomes, and excellent use of named (organism) examples, including local species and habitats. Show excellent organizational, presentational and/or analytical skills and fieldwork techniques. Excellent or outstanding (for A+) work relative to what is required at degree level.				
	B Evidence of substantial understanding and a good grasp of the subject as demonstrated by attainment of the majority of learning outcomes, and use of named (organism) examples, including local species and habitats. Show good organizational, presentational and/or analytical skills and fieldwork techniques. Work more than sufficient for what is required at degree level.					
	С	Evidence of general understanding with an adequate (but general but incomplete attainment of most of the learning out Show fair organizational, analytical, presentational and/or at for what is required for degree level.	tcomes, with limited use of named (	organism) example:		
	D	Evidence of retention of a minimum of relevant informatiknowledge is very incomplete), as demonstrated by partial familiarity with fieldwork techniques, habitats or organisms. I required at degree level.	but limited attainment of learning of	utcomes. Insufficier		

	Fail	Evidence of poor or inadequate knowledge outcomes cannot be attained. Little or no ev Work fails to reach degree level.		
Course Type	Lecture wit	th laboratory component course		
Course Teaching & Learning Activities	Activities		Details	No. of Hours
a Learning Activities	Lectures		24 hours lectures, plus 10 hours of lectures during residential field course	34
	Laborator	у	at least 36 hours field and laboratory work, as groups and individuals	36
	Reading / Self study of intreading		during the semester in the form of internet tutorials, assigned reading and a laboratory workshop	80
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)
	Assignme	nts		40
	Examinati	on		60
Required/recommended reading and online materials	in HKU libr Stiling, P. ( An up-to-c	Silk, J.B. (1997) How Humans Evolve ary.)  (2002) Ecology: Theories and Applicational Application	ons (4th Edition). Prentice Hall, Sing scientific literature, background rea	apore.
Course Website	http://www	.biosch.hku.hk/ecology/lsc/		
Additional Course Information	A compulsory 5-day residential field component during the reading week.  Details of the location and cost of the residential field course, which will be held in the Reading week of semester 1, will be made available at the start of the semester. Cost per head in 2014-2015 was \$830 (not refundable).			

· ,	gy and env	ironmental adaptation (6 credits)	Academic Year	2014		
Offering Department	Biological S	Sciences	Quota	40		
Course Co-ordinator	Prof A O L	Wong, Biological Sciences (olwong@hku.hk)				
Teachers Involved	Prof A S T	Prof A O L Wong, Biological Sciences Prof A S T Wong, Biological Sciences Dr W Y Lui, Biological Sciences				
Course Objectives	aquatic hat especially of environmer	e covers the major aspects of animal physiology for epitats. Stress will be given to the functional interactions on the mechanisms by which animals obtain resources ntal changes via sensory structures, and respond to a forms & functions.	s between animals and t for survival from the env	he environment ironment, detec		
Course Contents & Topics	energy me inter-tidal, a adaptations Background signals: fur navigation environmer	cepts of animal adaptation to environmental changes tabolism according to oxygen availability; Different mand terrestrial habitats; Cross-adaptation to different as in mammals; Visual signals & differential levels of phad adaptation: functions & mechanisms for color presentions & mechanisms of detection in aquatic & terres without visual signals; Behavioral, morphological & ht: extreme hot vs freezing cold; salinity changes in labitats on osmoregulation, water balance & nitrogenou	odels of gaseous excha- environment: air-breathin otoreception from protoz entation; Sound wave as strial habitats; Echo sour & physiological adaptat aquatic habitats & wate	nge for aquatic, g fish vs diving to mammals environmental ding in bats for tons in hostile		
Course Learning Outcomes	1. Have a b	sful completion of this course, students should be able to proad understanding on functional interactions between the the role of the environment in shaping the evolution hend a wide range of physiological adaptations (both shall stress.	animals and their enviro of animal structures & fu	nctions.		
Pre-requisites (and Co-requisites and Impermissible combination)		IOL2103 Biological sciences laboratory course or B Biostatistics or BIOL2306 Ecology & evolution	IOL2220 Principles of I	piochemistry or		
	N	N Examination				
Offer in 2014 - 2015			Examination			
	Υ		Examination			
Offer in 2015 - 2016			Examination			
Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade Grade Descriptors	Υ	Demonstrate thorough mastery at an advanced level of extensive learning outcomes. Show strong analytical and critical abilities and and ability to apply knowledge to a wide range of complex, familia organizational skills. Writings consistently demonstrate informed range of relevant concepts.	e knowledge required for attai l logical thinking, with evidence ar and unfamiliar situations. Ap	ning all the course of original thought, ply highly effective		

		learning outcomes. Show evidence of anal knowledge to familiar and some unfamilia demonstrate informed, thoughtful intellectual of	r situations. Apply effective of	organizational skills. Writings mostly	
	С	Demonstrate general but incomplete commo outcomes. Show evidence of some analytical to most familiar situations. Apply moderate intellectual engagement with concepts or thec	and critical abilities and logical all effective organizational skill	thinking, and ability to apply knowledge s. Writings mostly indicate informed,	
	D	Demonstrate partial but limited command of knowledge required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational skills. Writings indicate some intellectual engagement with concepts or theories but mostly at a superficial level.			
	Fail	Demonstrate little or no evidence of command of knowledge required for attaining the course learning Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply to solve problems. Organizational skills are minimally effective or ineffective. Writings reveal an a intellectual engagement with concepts or theories. Writings are irrelevant or superficial.			
Course Type	Lecture-ba	sed 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 (%)	
	Assignme	nts		25	
	Examinati	on		75	
Required/recommended reading and online materials	<ol> <li>E. N. Marieb (2012) Essentials of Human Anatomy &amp; Physiology. Benjamin Cummings.</li> <li>C. L. Stanfield (2011) Principles of Human Physiology, Benjamin Cummings.</li> <li>R. W. Hill, G. A. Wyse &amp; M. Anderson (2008) Animal Physiology, Sinauer Associate, Inc., Sunderland</li> <li>C. D. Myoyes &amp; P. M. Schulte (2008) Principles of Animal Physiology. Benjamin Cummings.</li> </ol>			mings. uer Associate, Inc., Sunderland	
Course Website	http://mood	lle.hku.hk/			
Additional Course Information		e Website of School of Biological Scier e will be offered subject to a minimum		ailability of teachers.	

<b>BIOL3107 Plant physiolog</b>	y (6 credits	s)		Academic Year	2014	
Offering Department	Biological	Sciences		Quota	30	
Course Co-ordinator	Dr W K Yip	Dr W K Yip, Biological Sciences (wkyip@hku.hk)				
Teachers Involved	Dr W K Yi	Dr W K Yip, Biological Sciences				
Course Objectives		To give an understanding of plant processes such as plant growth and development and their regulatory mechanisms.				
Course Contents & Topics	signal tran	Discovery, assay, chemical nature, mechanism, structure-activity relationships, physiological effects, and signal transduction of plant hormones. Hormonal transport. Selected topics on plant growth and development including photo-morphogenesis, seed germination, dormancy, apical dominance, fruit ripening, leaf abscission, and plant defense.				
Course Learning Outcomes	1. Underst 2. Underst	On successful completion of this course, students should be able to:  1. Understand the study of plant biology using mutants in model plant Arabidopsis.  2. Understand biotechnological opportunities by manipulating plant gene expression.  3. Understand the regulation of plant growth and development by various plant hormones.				
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in Blo	OL2103 Biological sciences laborator	y course			
Offer in 2014 - 2015	Y 1st	sem		Examination	Dec	
Offer in 2015 - 2016	Υ					
Course Grade	A+ to F					
Grade Descriptors	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	B In written examination: coherent organization and clear presentation, the discussion would be a complete and critical response to questions. In practical sessions: full understanding of the practical aims; submit accurate reports.				
	C In written examination and practical sessions: Good in parts, but important points omitted. Might also have defects in presentation or be not very well written. Reasonably competent, but might show misunderstanding of the material: significant inaccuracies or errors.					
		In written examination and practical sessions: Some knowledge of the material is evident, but ther deficiencies in understanding, organization, clarity or accuracy. Write-ups that are unduly brief woul category.				
	D					
	D Fail	deficiencies in understanding, organization	, clarity or accuracy. Write- ns: Poor knowledge and und	ups that are unduly bri	ef would fall into this	
Course Type	Fail	deficiencies in understanding, organization category.  In written examination and practical session	, clarity or accuracy. Write- ns: Poor knowledge and und	ups that are unduly bri	ef would fall into this	

	Lectures		24
	Laboratory		24
	Tutorials		6
	Reading / Self study		100
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)
	Examination		75
	Laboratory reports		25
Required/recommended reading and online materials	P. J. Davis: Plant Hormones: Physiology, E 1995, 2nd ed.) Lecturing materials and journal articles will	·	ology (Martinus Nijhoff Publishers,
Course Website	http://moodle.hku.hk/		
Additional Course Information	This course will be offered subject to a min	mum enrollment number and	availability of teachers.

BIOL3108 Microbial phys	iology (6 cr	edits)		Academic Year	2014		
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	pharmace provides n essential t Microbiolo	are amazing and important entities on jutics, biotechnologies, diseases contro molecular basis for understanding of the foundations for sub-disciplines of Micrology. Upon completion, students will a studies and be able to relate knowledge	II, and biogeochemic se important process biology, such as envi cquire fundamental	al processes. Mich es and applications ronmental, industri knowledge and m	robial Physiology s, and to serve a al, and medicina		
Course Contents & Topics	Physiology Adaption'. presented for the str Generation a coheren	Serving as a fundamental course for the understanding of the world of microorganisms, Microbia Physiology is organized and presented in three themes: 'Microbial Rules', 'Microbial Breath', and 'Microbia Adaption'. Under these three themes, a broad range of highly educational and interesting topics at presented including: 'Microorganisms and their position in the living world', 'Fundamental methodologie for the study of microbes', 'Microbial structures and functions', 'Microbial growth and control', 'Energ Generation', 'Central metabolism', and 'Regulation and control of metabolic Activities'. Topics are taught a coherent manner with a highly interactive tutorial session following each of the topics such that studen will achieve a high quality, stimulating, and problem-based learning experiences.					
Course Learning Outcomes	On succes	On successful completion of this course, students should be able to:					
	2. Compre 3. Relate I	Appreciate the diversity of microbial metabolisms and the strategies for their adaptive responses.     Comprehend the principles underlying the dynamic nature of microbial physiology.     Relate knowledge to practical application of microbes in industry and medicine.     Develop abilities to read and assess scientific literatures in microbiology area.					
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in BI	IOL2103 Biological sciences laboratory	course				
Offer in 2014 - 2015	Y 1st	sem		Examination	Dec		
Offer in 2015 - 2016	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.					
	B Demonstrate substantial command of a broad range of knowledge required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational skills.						
	C Demonstrate general but incomplete command of knowledge required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational skills.						
	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 comman Lack of analytical and critical abilities, logical a to solve problems. Organizational skills are mi	and coherent thinking. Sho	w very little or no ability			
Course Type	Lecture-ba	ased course					
Course Teaching	Activities	S	Details		No. of Hours		
& Learning Activities	Lectures				36		
	Tutorials				12		
	Project w	vork					
		/ Self study			100		

and Weighting	Methods	Details	Weighting in final course grade (%)
	Assignments		10
	Examination		50
	Test	mid-term I (20%), mid-term II (20%)	40
Required/recommended reading and online materials	Primary Text Book: Prescott, Harley, and Klein's Microbiology, by Jo Woolverton, published by McGraw-Hill Supplementary Reading: On-line textbook of Bacteriology: Kenneth Tobar URL (http://www.textbookofbacteriology.net/)	•	
Course Website	http://moodle.hku.hk/		
Additional Course Information	This course will be offered subject to a minimum of	enrollment number and availability of	teachers.

BIOL3109 Environmental	microbiolo	gy (6 credits)	Academic	Year	2014		
Offering Department	Biological	Sciences	Quota		40		
Course Co-ordinator	Dr J D Gu	ı, Biological Sciences (jdgu@hku.hk)					
Teachers Involved	Dr J D Gu	, Biological Sciences					
Course Objectives	environme which the microorga	To familarize students with the role of various microorganisms in natural process which affect our environment, such as cycling of chemical elements, interactions with plants and animals, and the way is 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	<ol> <li>Contrib</li> <li>Microbi</li> <li>Microbi</li> </ol>	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 succes	ssful completion of this course, students	s should be able to:				
Pre-requisites	biochemic 2. Know microorga 3. Apply th	tand a range of microorganisms in the cal capability and host range. the specific biochemical processes, unisms and their distribution in the environme appropriate techniques in environme IOL2103 Biological sciences laboratory	enzymes involved and reaction onment. ental and microbial research.				
(and Co-requisites and Impermissible combination)							
Offer in 2014 - 2015	Y 2nd	d sem	Examinati	on	May		
Offer in 2015 - 2016	Υ						
Course Grade	A+ to F						
Grade Descriptors	A Thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Thorough grasp of the subject matter. Show very strong analytical and critical abilities and high logical thinking, with evidence of original thought. Apply highly effective lab skills and techniques. Critical use of data and results to draw appropriate and insightful conclusions. Apply highly effective organizational and presentational skills.						
	B Substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Substantial grasp of the subject. Show evidence of analytical and critical abilities and logical thinking. Apply effective lab skills and techniques. Correct use of data of results to draw appropriate conclusions. Apply effective organizational and presentational skills.						
	С	General but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. General but incomplete grasp of the subject. Evidence of some analytical and critical abilities and logical thinking. Apply moderately effective lab skills and techniques. Mostly correct but some erroneous use of data and results to draw appropriate conclusions. Apply moderately effective organizational and presentational skills.					
	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 knowl Evidence of little or no grasp of the knowle analytical and critical abilities, logical and techniques. Misuse of data and results a presentational skills are minimally effective or	edge and understanding of the subject coherent thinking. Minimally effective and/or unable to draw appropriate co	. Eviden or ineffe	ce of little or lack of ective lab skills and		
Course Type	Lecture w	ith laboratory component course					
	Activitie	s	Details		No. of Hours		
	Lectures				2		
	Lectures				24		
Course Teaching & Learning Activities		ry					

	Tutorials		4
	Reading / Self study		100
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)
	Assignments		10
	Examination		50
	Laboratory reports		25
	Presentation	including report	10
	Test		5
Required/recommended reading and online materials	M.T. Madigan, J. M. Martinko, P.V. Dunlap (Pearson/Benjamin Cummings, 2009, 12th ed.) R.M. Atlas and R. Bartha: Microbial Ecology: Fun 4th ed.) References Molecular Biology of the Cell - Fifth Edition by Bru Julian Lewis, Martin Raff, Keith Roberts, Peter W. R. Mitchell and JD. Gu: Environmental Microbiol ed.)	damentals and Applications (Benja ice Alberts, Alexander Johnson, alter (December 2007)	
Course Website	http://moodle.hku.hk/		
Additional Course Information	This course will be offered subject to a minimum of	enrollment number and availability	of teachers.

BIOL3110 Environmental	oxicology (	6 credits) Academic Year					
Offering Department	Biological S	Sciences Quota	60				
Course Co-ordinator	Dr J D Gu,	Biological Sciences (jdgu@hku.hk)					
Teachers Involved		Biological Sciences Wu, Biological Sciences					
Course Objectives	fate of polluresponse v	be students to the basic principles of environmental and ecological toxicology, atants in lithosphere, hydrosphere, atmosphere and biosphere. Mechanisms will be analyzed through adsorption, metabolism, toxicity and elimination and enzymes involved will be highlighted. Specific cases of toxicity will	of toxicity as dos . Major metaboli				
Course Contents & Topics	bioaccumul 2. Partitioni 3. Quantitat 4. Emergino 5. Eliminatio	Environmental chemistry of pollutants and their toxicity and factors governing toxic effects bioaccumulation and biomagnification     Partitioning and transformation of environmental pollutants     Quantitative toxicology using dose-response approaches     Emerging endocrine-disrupting chemicals and carcinogens at molecular levels     Elimination of pollutants from the environments     Laboratory testing of toxicity and review various adsorption isotherm models					
Course Learning Outcomes	1. Understa 2. Understa	sful completion of this course, students should be able to:  and fate and distribution of chemicals in various compartments of the ecosyst and toxicity through adsorption, metabolism, elimination and target site and quand mechanism of toxicity from specific pollutants of choice.					
	4. Understa mineralizati	and specific biochemical processes and enzymes involved in pollutants t	ransformation and				
(and Co-requisites and	4. Understa mineralizati 5. Understa Pass in B	and specific biochemical processes and enzymes involved in pollutants tion.					
and Co-requisites and mpermissible combination)	4. Understa mineralizati 5. Understa Pass in B	and specific biochemical processes and enzymes involved in pollutants toon. and appropriate techniques in environmental cleaning up BIOL2103 Biological sciences laboratory course or ENVS3042 Pollutiontal chemistry					
and Co-requisites and mpermissible combination) Offer in 2014 - 2015	Understamineralizati     Understa     Pass in B     Environmer	and specific biochemical processes and enzymes involved in pollutants toon.  and appropriate techniques in environmental cleaning up  BIOL2103 Biological sciences laboratory course or ENVS3042 Pollutiontal chemistry	n or CHEM3141				
(and Co-requisites and Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016	Understamineralization     Understamineralization     Understamineralization     Value of the state of t	and specific biochemical processes and enzymes involved in pollutants toon.  and appropriate techniques in environmental cleaning up  BIOL2103 Biological sciences laboratory course or ENVS3042 Pollutiontal chemistry	n or CHEM3141				
Pre-requisites (and Co-requisites and Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade Grade Descriptors	Understamineralization     Understamineralization     Understamineralization     Value of the second of the s	and specific biochemical processes and enzymes involved in pollutants toon.  and appropriate techniques in environmental cleaning up  BIOL2103 Biological sciences laboratory course or ENVS3042 Pollutiontal chemistry	n or CHEM3141  Dec  ttaining all the course itical abilities and highes. Critical use of data				
(and Co-requisites and Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade	4. Understa mineralizati 5. Understa Pass in B Environmer Y 1st s Y A+ to F	and specific biochemical processes and enzymes involved in pollutants to tion.  and appropriate techniques in environmental cleaning up  BIOL2103 Biological sciences laboratory course or ENVS3042 Pollutional chemistry  em  Examination  Thorough mastery at an advanced level of extensive knowledge and skills required for a learning outcomes. Thorough grasp of the subject matter. Show very strong analytical and clogical thinking, with evidence of original thought. Apply highly effective lab skills and techniquand results to draw appropriate and insightful conclusions. Apply highly effective organization.	Dec  ttaining all the course itical abilities and high es. Critical use of data and presentational and presentational at most of the course at abilities and logical				
(and Co-requisites and Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade	4. Understamineralizati 5. Understa Pass in B Environmer  Y 1st s Y A+ to F	and specific biochemical processes and enzymes involved in pollutants to ion.  and appropriate techniques in environmental cleaning up  BIOL2103 Biological sciences laboratory course or ENVS3042 Pollutional chemistry  em  Examination  Thorough mastery at an advanced level of extensive knowledge and skills required for a learning outcomes. Thorough grasp of the subject matter. Show very strong analytical and c logical thinking, with evidence of original thought. Apply highly effective lab skills and technique and results to draw appropriate and insightful conclusions. Apply highly effective organizations kills.  Substantial command of a broad range of knowledge and skills required for attaining at learning outcomes. Substantial grasp of the subject. Show evidence of analytical and critical thinking. Apply effective lab skills and techniques. Correct use of data of results to draw appropriate to draw appropriate and critical subject. Show evidence of analytical and critical sciences are considered to the constant of the subject. Show evidence of results to draw appropriate and constant of the subject. Show evidence of analytical and critical sciences are constant of the subject. Show evidence of results to draw appropriate and critical sciences are constant or constant of the subject. Show evidence of analytical and critical sciences are constant or cons	Dec  ttaining all the course itical abilities and high es. Critical use of data and presentational and presentational and presentations at most of the course all abilities and logical propriate conclusions of the course learning call abilities and logical abilities and logical evous use of data and				
(and Co-requisites and Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade	4. Understamineralizati 5. Understa Pass in B Environmer  Y 1st s Y A+ to F  A B	and specific biochemical processes and enzymes involved in pollutants to ion.  and appropriate techniques in environmental cleaning up  BIOL2103 Biological sciences laboratory course or ENVS3042 Pollutional chemistry  em  Examination  Thorough mastery at an advanced level of extensive knowledge and skills required for a learning outcomes. Thorough grasp of the subject matter. Show very strong analytical and c logical thinking, with evidence of original thought. Apply highly effective lab skills and technique and results to draw appropriate and insightful conclusions. Apply highly effective organizations kills.  Substantial command of a broad range of knowledge and skills required for attaining at leaterning outcomes. Substantial grasp of the subject. Show evidence of analytical and critic thinking. Apply effective lab skills and techniques. Correct use of data of results to draw apply effective organizational and presentational skills.  General but incomplete command of knowledge and skills required for attaining most of outcomes. General but incomplete grasp of the subject. Evidence of some analytical and critic thinking. Apply moderately effective lab skills and techniques. Mostly correct but some error	Dec  taining all the course itical abilities and high es. Critical use of data and and presentations at most of the course at abilities and logical ecous use of data and ational skills.  se learning outcomes of some coherent and techniques. Limited				

		al and coherent thinking. Minimally effective or is esults and/or unable to draw appropriate conclu- ctive or ineffective.	
Course Type	Lecture with laboratory component course		
Course Teaching	Activities	Details	No. of Hours
& Learning Activities	Lectures		24
	Laboratory	laboratory, assignment; and seminar	36
	Reading / Self study		100
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)
	Examination		60
	Laboratory reports	student-based assessment includes laboratory report, assignment, presentations or other forms	40
Required/recommended reading and online materials	D.G. Crosby: Environmental Toxicology an W. Stumm, J.J. Morgan: Aquatic Chemistry 3rd ed.) R. Mitchell and JD. Gu: Environmental Mi	y: Chemical Equlibria and Rates in Natural	
Course Website	http://moodle.hku.hk/		
Additional Course Information	This course will be offered subject to a min	imum enrollment number and availability o	f teachers.

	(6 credits)				Academic Year	2014	
Offering Department	Biological	Sciences			Quota	60	
Course Co-ordinator	Dr J C Y I	ee, Biological S	Sciences (jettylee@	hku.hk)			
Teachers Involved	Dr J C Y I	ee, Biological S	Sciences				
Course Objectives		To provide a basic understanding of chemistry in food systems, and to provide practical training in chemistry related to food science and nutrition.					
Course Contents & Topics	minor con and chem for unders foods, and A series of	The course will cover the components of food, including water, proteins, carbohydrates and lipids, and minor components such as enzymes, vitamins, minerals, colorants, flavorants and additives. The physical and chemical properties of these important constituents of foods are covered in detail, and form the basis for understanding the reactions which occur during the production, processing, storage and handling of foods, and in understanding the methods used in analyzing foods.  A series of laboratory sessions will cover analysis of food components, protein chemistry, lipid oxidation properties of sugars and starches, enzymatic and non-enzymatic browning reactions, and sensory analysis of foods.					
Course Learning Outcomes	1. Unders 2. Unders	On successful completion of this course, students should be able to:  1. Understand the functions and properties of major and minor food components.  2. Understand the basic chemistry behind food processing.  3. Have integrated their knowledge of biological and chemical principles into a food science and nutrition					
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in B	IOC2600 Basic	biochemistry or BIC	L2220 Principles of t	piochemistry		
-		Y 2nd sem Examination May					
Offer in 2014 - 2015	Y 2nd	d sem			Examination	May	
	Y 2nd	l sem			Examination	May	
Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade		i sem			Examination	May	
	Υ	Demonstrate th		knowledge. Critically use	Examination  w extensive knowledge and lab skills and techniques and	understanding of the	
Offer in 2015 - 2016 Course Grade	Y A+ to F	Demonstrate th topics covered a results to draw a Demonstrate su content and a h	and can readily apply this appropriate and insightfund stantial grasp of the sunigh level of competence	knowledge. Critically use conclusions. bject matter covered. She in the topics covered an	w extensive knowledge and	understanding of the d analysis of data and understanding of the ge and skills to most	
Offer in 2015 - 2016 Course Grade	Y A+ to F	Demonstrate th topics covered a results to draw a Demonstrate su content and a h situations. Use Demonstrate ge understanding	and can readily apply this appropriate and insightfu ibstantial grasp of the suigh level of competence ab skills and techniques eneral but incomplete gra of the main areas of co	knowledge. Critically use conclusions.  bject matter covered. Shin the topics covered an and analysis of data and risp of the subject matter content and has achieved	w extensive knowledge and lab skills and techniques and ow thorough knowledge and d able to apply this knowled	understanding of the d analysis of data and understanding of the ge and skills to most route conclusions.	
Offer in 2015 - 2016 Course Grade	Y A+ to F  A B	Demonstrate th topics covered a results to draw a Demonstrate sucontent and a histuations. Use I Demonstrate ge understanding covered. Use la Demonstrate pa Show a basic k	and can readily apply this appropriate and insightfur with the standard propriate and insight with the same and the same and the same areas of the same artial but limited grasp, nowledge and understand appropriate and understandard propriate and the same artial but limited grasp, nowledge and understandard propriate and the same artial but limited grasp, nowledge and understandard propriate and the same artial but limited grasp, nowledge and understandard propriate and the same artists and the same artists and the same artists and the same artists are same artist	knowledge. Critically use conclusions. bject matter covered. Shin the topics covered an and analysis of data and respondent and has achieved and analysis of data and re with retention of some redding of the content and h	w extensive knowledge and lab skills and techniques and ow thorough knowledge and dable to apply this knowled results to draw generally approper overed. The student has a san adequate level of company the san adequate	understanding of the d analysis of data and understanding of the ge and skills to most ropriate conclusions. sound knowledge and letence in the topics ropriate conclusions. oject matter covered. of competence in the	
Offer in 2015 - 2016 Course Grade	Y A+ to F  A B C	Demonstrate the topics covered a results to draw a content and a histuations. Use I Demonstrate gunderstanding covered. Use la Demonstrate per show a basic ktopics covered occasionally.  Demonstrate little lementary kno	and can readily apply this appropriate and insightfu abstantial grasp of the suigh level of competence abs skills and techniques and the skills and techniques a cartial but limited grasp, nowledge and understand Use lab skills and techniques and the skills and techniques and the skills and techniques and understandile to room or grasp, with rewiedge and understanding the skills and techniques and the skills and the sk	knowledge. Critically use conclusions.  bject matter covered. Shin the topics covered an and analysis of data and responded to the subject matter of the subject matter and has achieved and analysis of data and responded to the subject matter of the subject matter and has achieved and analysis of data and responded to the subject matter and the subject matter and analysis of content and included and analysis of contents of little relevant in ag in few areas of the content and the subject matter and th	w extensive knowledge and lab skills and techniques and with the work of the w	understanding of the d analysis of data and understanding of the ge and skills to most opriate conclusions. Sound knowledge and setence in the topics ropriate conclusions. Diject matter covered. of competence in the propriate conclusions statter covered. Show imited competence in	
Offer in 2015 - 2016 Course Grade	Y A+ to F  A B C D	Demonstrate the topics covered a results to draw a content and a histuations. Use Independent of the properties of the topics covered. Use late topics covered occasionally.  Demonstrate littlementary kno some of the top generally to inal	and can readily apply this appropriate and insightfur appropriate and insightfur abstantial grasp of the sight level of competence ab skills and techniques appropriate and the skills and techniques appropriate and the skills and techniques a artial but limited grasp, anowledge and understandil tele or no grasp, with rewiedge and understandil bics covered. Use lab s	knowledge. Critically use conclusions.  bject matter covered. Shin the topics covered an and analysis of data and responded to the subject matter of the subject matter and has achieved and analysis of data and responded to the subject matter of the subject matter and has achieved and analysis of data and responded to the subject matter and the subject matter and analysis of content and included and analysis of contents of little relevant in ag in few areas of the content and the subject matter and th	w extensive knowledge and lab skills and techniques and with the skills and techniques and dable to apply this knowledge and dable to apply this knowledge and the seults to draw generally approvered. The student has an adequate level of compounds to draw moderately applevant information of the sultiple subject of the subject modernation, and the subject modernation and has achieved very lead to subject modernation.	understanding of the d analysis of data and understanding of the ge and skills to most opriate conclusions. Sound knowledge and setence in the topics ropriate conclusions. Diject matter covered. of competence in the propriate conclusions statter covered. Show imited competence in	

& Learning Activities	Lectures		24
	Laboratory		24
	Tutorials		6
	Reading / Self study		100
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)
	Assignments		30
	Examination		70
Required/recommended reading and online materials	Fennema OR, Food Chemistry (Mar Belitz HD, Grosch W, Schieberle, P,	cel Dekker 4th Ed, 2008) Food Chemistry (Springer 4th Ed, 20	009)
Course Website	http://moodle.hku.hk/		

<b>BIOL3202 Nutritional biod</b>	hemistry (6	credits)	A	cademic Year	2014		
Offering Department	Biological	Sciences	Q	uota	100		
Course Co-ordinator	Dr E T S L	i, Biological Sciences (etsli@hku.hi	k)				
Teachers Involved	Dr E T S L	i, 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	of macron	Essential nutrients and their requirements. Energy balance and caloric value of foods. Metabolic co of macronutrient utilization. Nutritional impacts of hexoses, long chain polyunsaturated fatty acids amino acids. Dietary recommendations.					
Course Learning Outcomes	1. Undersi 2. Explain 3. Undersi 4. Undersi	On successful completion of this course, students should be able to:  1. Understand the concept of nutrient requirements. 2. Explain how different organs coordinate to achieve metabolic control of glucose homeostasis. 3. Understand the metabolic pathways of various polyunsaturated fatty acids. 4. Understand the theoretical constructs of nitrogen requirement and the importance of the urea cycle. 5. Assess the impacts of dietary inadequacy.					
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in BI	OL2220 Principles of biochemistry of	or BIOC2600 Basic biocher	mistry			
Offer in 2014 - 2015	Y 1st	sem	E	xamination	Dec		
Offer in 2015 - 2016	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 organization / writing skills.						
	В	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 organization / writing skills.					
	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 sometime erroneous conclusions. Demonstrate basic organization / writing skills.					
	Fail	Demonstrate little or no grasp, with retention of little relevant information, of the subject matter covered. Show lack o coherent and logical thinking, and minimal competence in problem solving. Fail to integrate information and identify problems. Seriously deficient in ability to analyze and interpret scientific data and draw conclusions. Demonstrate poor organization / writing skills.					
Course Type	Lecture-ba	ased course					
Course Teaching	Activities	S	Details		No. of Hours		
& Learning Activities	Lectures				36		
	Tutorials		tutorials/guided studie	es	12		
	Reading	/ Self study	-		100		
Assessment Methods and Weighting	Methods		Details		Veighting in fina		
	Assignme	ents			15		
	Examinat	tion			70		
	Test				15		
Required/recommended reading		. Metabolic regulation: A Human Pe P.C., Harvey R.A. & Ferrier D.R. Lip			Lippincott, 2008		

		ts)		Academic Year	2014		
Offering Department	Biological S	Sciences		Quota	60		
Course Co-ordinator	Dr H S El-N	Nezami, Biological Sciences (elnezami	@hku.hk)				
Teachers Involved	Dr H S El-N	Nezami, Biological Sciences					
Course Objectives		e provides the key concepts and prin- between microorganisms and food., in detail.	•	0,			
Course Contents & Topics	their signi	Detection and enumeration of microbes in foods, Factors that influence microbes in foods, Spores an their significance, Physical methods of food preservation, Chemical preservation and natura antimicrobials, Foodborne pathogens.					
Course Learning Outcomes	On success	sful completion of this course, students	s should be able to:				
	<ol> <li>Demons that can sp</li> <li>Develop a food.</li> </ol>	e methods for evaluating microorganisi trate an understanding of the causes of oil a given food. and implement appropriate measures trate the ability to work in a team to inv	of food spoilage, and to control the spoila	I predict response of ge and pathogenic	microorganisms ir		
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in BIO	DC2600 Basic biochemistry or BIOL22	20 Principles of biod	hemistry			
Offer in 2014 - 2015	Y 2nd	sem		Examination	May		
Offer in 2015 - 2016	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.						
	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.						
	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.						
		critical abilities and logical thinking with limite techniques and analysis of data and results to	d competence in profess draw moderately approp	ional-level problem solv oriate but sometimes err	ring. Use lab skills and oneous conclusions to		
	D	critical abilities and logical thinking with limite techniques and analysis of data and results to	d competence in profess o draw moderately approp effective team-based org tetention of some relevant thinking, but lacking com f data and results to draw	ional-level problem solv oriate but sometimes err ganizational and present int information, of the su petence in professional w sometimes appropriat	ring. Use lab skills and oneous conclusions to tational skills.  Libject matter covered.  Level problem solving. te but often erroneous		
		critical abilities and logical thinking with limite techniques and analysis of data and results to real-world problems. Demonstrate moderately Demonstrate partial but limited grasp, with r Show some evidence of coherent and logical Use lab skills and techniques and analysis o conclusions to real-world problems. Demon	d competence in profess of draw moderately approper effective team-based orgetention of some relevant thinking, but lacking comfedata and results to draw strate team-based organish for little relevant information competence in profession ineffectively, leading gen	ional-level problem solvoriate but sometimes error anizational and present anizational and present anizational and professional w sometimes appropriatizational and presenta ani, of the subject matter nal-level problem solvir lerally to inappropriate a	ring. Use lab skills and oneous conclusions to tational skills.  ubject matter covered.  level problem solving. the but often erroneous tional skills of limited covered. Show lack of ng. Use lab skills and and usually erroneous		
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Course Teaching & Learning Activities  Assessment Methods	Fail  Lecture wit  Activities Lectures Laboratory Tutorials Reading /  Methods  Assignment Examinating Laboratory Food Micro Microbiolog Food Micro	critical abilities and logical thinking with limite techniques and analysis of data and results to real-world problems. Demonstrate moderately  Demonstrate partial but limited grasp, with r Show some evidence of coherent and logical Use lab skills and techniques and analysis o conclusions to real-world problems. Demon effectiveness.  Demonstrate little or no grasp, with retention of coherent and logical thinking, and minimal techniques and analysis of data and results conclusions to real-world problems. Demonstrate little or no grasp, with retention of the problems and analysis of data and results conclusions to real-world problems. Demonstrate little or no grasp, with retention of the problems and the problems of the problems. Demonstrate little or no grasp, with retention of the problems and the problems and the problems. Demonstrate little or no grasp, with retention of the problems and the problems. Demonstrate little or no grasp, with retention of the problems and the problems. Demonstrate little or no grasp, with retention of the problems. Demonstrate little or no grasp, with retention of the problems. Demonstrate little or no grasp, with retention of the problems. Demonstrate little or no grasp, with retention of the problems. Demonstrate little or no grasp, with retention of the problems. Demonstrate little or no grasp, with retention of the problems. Demonstrate little or no grasp, with retention of the problems. Demonstrate little or no grasp, with retention of the problems. Demonstrate little or no grasp, with retention of the problems. Demonstrate little or no grasp, with retention of the problems. Demonstrate little or no grasp, with retention of the problems. Demonstrate little or no grasp, with retention of the problems and logical literature problems. Demonstrate little or no grasp, with retention of the problems. Demonstrate little or no grasp, with retention of the problems and logical literature problems. Demonstrate little or no grasp, with retention of the problems and logical literature pr	d competence in profess of draw moderately appropress of effective team-based orgetention of some relevant thinking, but lacking come fedata and results to draw strate team-based organistrate ineffectively, leading generate ineffectiveness team-based organistrates of the profession	ional-level problem solvoriate but sometimes error ganizational and present in information, of the supetence in professional with sometimes appropriate in a present in information in a present in a professional and present in a professional and present in a professional arror in a professional arror in a professional arror in a professional in a present in a professional arror in a professional arror in a present in a	ing. Use lab skills and oneous conclusions to tational skills.  ibject matter covered. Idevel problem solving. Ite but often erroneous titional skills of limited covered. Show lack of ig. Use lab skills and and usually erroneous dipresentational skills.  No. of Hours  No. of Hours  24  12  100  Weighting in final course grade (%)  40  40  70  70  71  72  73  74  75  76  77  78  78  78  78  78  78  78  78		

<b>BIOL3204 Nutrition and the</b>	life cycle (6 credits)	Academic Year	2014	
Offering Department	Biological Sciences	Quota	70	
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	Nutritional needs vary throughout different stages of the life cycle. This course aims to cover the functional roles of essential nutrients and highlight the nutritional concerns during specific times of growth, development, and aging.				
Course Contents & Topics	key issue that influe	Teaching and learning will take place through an evidence-based approach and will be organized around key issues: vitamin and mineral needs and their metabolism; physiological and psychological determinants that influence nutrient requirements at different stages of the human life cycle; socio-economic factors that influence dietary habit and nutritional status.				
Course Learning Outcomes	On succe	ssful completion of this course, studer	nts should be able to:			
	<ol> <li>Have fundamental knowledge of essential micronutrient metabolism.</li> <li>Be able to critically assess and identify the specific needs at different stages of the life cycle.</li> <li>Relate the concept of requirement to physiological needs.</li> <li>Understand the impact of socio-cultural factors on nutritional status.</li> </ol>					
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in E	BIOC2600 Basic biochemistry or BIO stry	L2220 Principles of biochemistry	or BIOL3202 Nutritional		
Offer in 2014 - 2015	Y 2nd	d sem	Examination	on May		
Offer in 2015 - 2016	Υ		'			
Course Grade	A+ to F					
Grade Descriptors	A					
	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 team-based organization and presentation skills.					
	С	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.				
	D	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.				
	Fail	coherent and logical thinking, and minimal	competence in problem solving. Fail to inte	on, of the subject matter covered. Show lack of olving. Fail to integrate information and identify tific data and draw conclusions. Demonstrate		
Course Type	Lecture-b	ased course				
Course Teaching	Activitie	·s	Details	No. of Hours		
& Learning Activities	Lectures			36		
	Tutorials		student-centered learning	12		
	Reading	/ Self study	-	100		
Assessment Methods and Weighting	Methods	3	Details	Weighting in final course grade (%)		
	Assignm	ents		30		
	Examina	tion		70		
Required/recommended reading and online materials	Edelstein 2009 Gropper S	Brown J.E. Nutrition Through the Life Cycle. Thomson, 2011 Edelstein S. & Sharlin J. Life Cycle Nutrition: An Evidence-based Approach. Jones & Bartlett Publishers 2009 Gropper S.S., Smith J.L & Groff J.L. Advanced Nutrition and Human Metabolism (Wadsworth, 2009) L. Kathleen Mahan & Sylvia Escott-Stump: Krause's Food, Nutrition, & Diet Therapy (Saunders, 2004,				
Course Website	http://mod	odle.hku.hk/				
Additional Course Information	This cour	se will be offered subject to a minimun	a enrollment number and availabilit	v of toochore		

BIOL3205 Human physiolo	Academic Year	2014	
Offering Department	Biological Sciences Quota 120		
Course Co-ordinator	Dr W Y Lui, Biological Sciences (wylui@hku.hk)		
Teachers Involved	Dr W Y Lui, Biological Sciences Prof F C C Leung, Biological Sciences Prof A O L Wong, Biological Sciences Dr E T S Li, Biological Sciences		
Course Objectives	The course covers major aspects of the physiology of the human body using an integrated approach. After completing 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	Overview of the physiological systems and homeostasis; Neural and system physiology; The digestive system; Cardiac physiology, the blorespiratory system; The urinary system; The skeletal & muscular syst rhythms; Central-peripheral communication in energy homeostasis.	ood vessels and blo	od pressure; The

Course Learning Outcomes	On successful completion of this course, students should be able to:  1. Comprehend the essence of how the body meets changing conditions while maintaining a relatively constant internal environment.  2. Understand the functions of various body systems.  3. Explain normal body functions through integration of basic physiologic concepts.					
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in Bl	Pass in BIOL2103 Biological sciences laboratory course				
Offer in 2014 - 2015	Y 1st	sem		Examination	Dec	
Offer in 2015 - 2016	Υ	Y				
Course Grade	A+ to F	A+ to F				
Grade Descriptors	A	Demonstrate thorough mastery at an adva learning outcomes. Show strong analytical and ability to apply knowledge to a wide ra organizational skills.	and critical abilities and log	ical thinking, with evide	nce of original thought,	
	В	Demonstrate substantial command of a bro learning outcomes. Show evidence of an knowledge to familiar and some unfamiliar s	alytical and critical abilitie	es and logical thinking		
	C Demonstrate general but incomplete command of knowledge required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational skills.					
	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 comm Lack of analytical and critical abilities, logica to solve problems. Organizational skills are	al and coherent thinking. S	how very little or no abi		
Course Type	Lecture-ba	ased course				
Course Teaching	Activities	3	Details		No. of Hours	
& Learning Activities	Lectures				36	
	Tutorials				12	
	Reading / Self study			100		
Assessment Methods and Weighting	Methods		Details		Weighting in final course grade (%)	
	Assignme	ents			30	
	Examinat	ion			70	
Required/recommended reading and online materials	Sherwood Johnson M Siegel G.	n D. U.: Human Physiology: An integra L.: Human Physiology: From Cells to M. D.: Human Biology (Pearson, 2006) J. et al.: Basic Neurochemistry (Acade S.E. & Myers A.K. Netter's Essential F	Systems (Thomson, ) emic Press, 2006)	2007)		
reading	Sherwood Johnson M Siegel G.	L.: Human Physiology: From Cells to 1. D.: Human Biology (Pearson, 2006) J. et al.: Basic Neurochemistry (Acade S.E. & Myers A.K. Netter's Essential F	Systems (Thomson, ) emic Press, 2006)	2007)		

<b>BIOL3206 Clinical nutrition</b>	ı (6 credits)	Academic Year	2014			
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 Wan, Biological Sciences					
Course Objectives	This course aims to provide understanding and insight into dietetics, specifically to:  1. Explain the relationships between diet and disease. 2. Describe the role of diet in the development and preventic diabetes, obesity and anorexia, cardiovascular disease, cancer, 3. Differentiate risk factors that influence dietary choice. 4. Describe the rationales for postoperative nutritional support for	on of common chronic of immune deficiency and r	diseases such a			
Course Contents & Topics	The basics of nutrition for health and fitness and medical n development and prevention of chronic diseases such as cance as bulimia nervosa, cardiovascular diseases, renal failure, etc. Medical nutrition therapy for food allergy and food intolerance. N	er, diabetes, obesity and Ialnutrition. Nutrition and	I anorexia as we immune functior			
Course Learning Outcomes	On successful completion of this course, students should be able 1. Discuss the different relationships between diet and disease. 2. Describe the role of diet in the development and preven cardiovascular disease, cancer, immune deficiency, and renal fa 3. Clearly differentiate and interpret risk factors that influence die 4. Describe the rationales for postoperative nutritional support fo	ntion of diabetes, obesi ilure. tary choice.	ty and anorexia			
Pre-requisites (and Co-requisites and	Describe the rationales for postoperative nutritional support for hospitalized patients.  Pass in BIOL3202 Nutritional biochemistry or BIOL3203 Food microbiology or BIOL3204 Nutrition and life cycle or BIOL3205 Human physiology					

Offer in 2014 - 2015	Y 2nd	Isem		Examination	May
Offer in 2015 - 2016	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. 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.				
	B Demonstrate 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, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills. Apply effective laboratory /fieldwork skills and techniques. Correct use of data of results to draw appropriate conclusions. Apply effective organizational and presentational skills.				
	С	Demonstrate general but incomplete comma learning outcomes. General but incomplete abilities and logical thinking, and ability to ay organizational and presentational skills. App Mostly correct but some erroneous use of effective organizational and presentational ski	grasp of the subject. Sh pply knowledge to most fa ply moderately effective I data and results to draw	ow evidence of some amiliar situations. Appl aboratory / fieldwork s	analytical and critical y moderately effective skills and techniques.
	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Partial but limited grasp of the subject, retention of some relevant information of the subject. 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 / 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 little or no evidence of comma outcomes. Little or no grasp of the knowled abilities, logical and coherent thinking. Sho Organization and presentational skills are millaboratory / fieldwork skills and techniques conclusions. Organization and presentational	dge and understanding of ow very little or no abilitinimally effective or ineffes. Misuse of data and	f the subject. Lack of ty to apply knowledge ctive. Apply minimally results and/or unable	analytical and critical e to solve problems. effective or ineffective
	Lecture-based course				
Course Type	Lecture-ba	2360 600136			
Course Teaching	1		Details		No. of Hours
Course Teaching	Activities		Details		No. of Hours
••	<b>Activities</b> Lectures		Details		36
Course Teaching	Activities Lectures Tutorials		Details		
Course Teaching	Activities Lectures Tutorials	s / Self study	Details  Details		36 12
Course Teaching & Learning Activities  Assessment Methods	Activities Lectures Tutorials Reading	Self study			36 12 100 Weighting in final
Course Teaching & Learning Activities  Assessment Methods	Activities Lectures Tutorials Reading	Self study			36 12 100 Weighting in final course grade (%)
Course Teaching & Learning Activities  Assessment Methods	Activities Lectures Tutorials Reading	S / Self study			36 12 100 Weighting in final course grade (%)
Course Teaching & Learning Activities	Activities Lectures Tutorials Reading Methods Assignme Examinat Presental Selected r S. Rodwe	S / Self study	Details  ass website.  py (7th ed.) Suitor	& Hunter: Nutritic	36 12 100 Weighting in final course grade (%) 20 60 20
Course Teaching & Learning Activities  Assessment Methods and Weighting  Required/recommended reading	Activities Lectures Tutorials Reading / Methods Assignme Examinat Presental Selected r S. Rodwe Application	S S S S S S S S S S S S S S S S S S S	Details  ass website.  py (7th ed.) Suitor	& Hunter: Nutritic	36 12 100 Weighting in final course grade (%) 20 60 20

ourse Co-ordinator eachers Involved  ourse Objectives  To introduce student confidence in the habasic concepts behin nondietary exposure toxicokinetic studies conducting food toxic	iological Sciences is to methods used in indling and interpretand toxicological eval to to chemicals. Stu in toxicological eva	in assessing the tation of toxicolo luation, and the udents will und	toxicity of foo gical data. Stu criteria for set erstand the ro	udents will also be ting guidance value ole of biochemical	introduced to the es for dietary and , metabolic and
eachers Involved  Dr H S El-Nezami, B  To introduce student confidence in the habasic concepts behin nondietary exposure toxicokinetic studies	iological Sciences is to methods used in indling and interpretand toxicological eval to to chemicals. Stu in toxicological eva	in assessing the tation of toxicolo luation, and the udents will und	toxicity of foo gical data. Stu criteria for set erstand the ro	udents will also be ting guidance value ole of biochemical	introduced to the es for dietary and , metabolic and
ourse Objectives  To introduce student confidence in the habasic concepts behin nondietary exposure toxicokinetic studies	is to methods used in indling and interpretand toxicological evalue to chemicals. Stu- in toxicological evalue in toxicological evalue	tation of toxicolo luation, and the udents will und	gical data. Stu criteria for set erstand the ro	udents will also be ting guidance value ole of biochemical	introduced to the es for dietary and , metabolic and
confidence in the habasic concepts behinondietary exposure toxicokinetic studies	indling and interpretand toxicological evalue to chemicals. Stuin in toxicological eva	tation of toxicolo luation, and the udents will und	gical data. Stu criteria for set erstand the ro	udents will also be ting guidance value ole of biochemical	introduced to the es for dietary and , metabolic and
	cological studies.			equip students w	ith basic skills in
(toxicokinetics), con substances, target of	Topics include a discussion on exposure and entry routes, fates of toxic substances in the body (toxicokinetics), concepts in experimental toxicology, the dose response relationship, actions of toxic substances, target organ effects, the actions and types of carcinogens. A survey of the health effects of common classes of toxic substances is also presented.				
On successful comp  1. Demonstrate an excretion of toxicante 2. Demonstrate an u 3. Demonstrate an u toxicants. 4. Demonstrate the in human health.	understanding of the s, including an under nderstanding of the nderstanding of the	ne processes inverstanding of the various effects in factors which un	volved in abso toxicokinetic b induced after e nderlie species	behavior of toxicant exposure to toxicant s differences in resp	s in mammals. ts. conse to potential

(and Co-requisites and Impermissible combination)	physiolog	y			
Offer in 2014 - 2015	Y 2nd	d sem Examina	ation	May	
Offer in 2015 - 2016	Υ	· · · · · · · · · · · · · · · · · · ·			
Course Grade	A+ to F				
Grade Descriptors	A	Demonstrate thorough grasp of the subject matter covered. Show strong analytics thinking, with evidence of creative ability and competence in professional-level piskills and techniques and analysis of data and results to draw appropriate and in problems. Demonstrate highly effective team-based organizational and presentation	roblem solvi sightful cond	ing. Critically use lab	
	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 critical abilities and logical thinking with limited competence in professional-level pr techniques and analysis of data and results to draw moderately appropriate but son real-world problems. Demonstrate moderately effective team-based organizational approach.	roblem solvir netimes erro	ng. Use lab skills and oneous conclusions to	
	D	Demonstrate partial but limited grasp, with retention of some relevant information Show some evidence of coherent and logical thinking, but lacking competence in p Use lab skills and techniques and analysis of data and results to draw sometimes conclusions to real-world problems. Demonstrate team-based organizational and effectiveness.	rofessional-l appropriate	level problem solving. e but often erroneous	
	Fail	Demonstrate little or no grasp, with retention of little relevant information, of the sub		covered. Show lack of	
		coherent and logical thinking, and minimal competence in professional-level professional techniques and analysis of data and results ineffectively, leading generally to inal conclusions to real-world problems. Demonstrate ineffectiveness team-based organ	ppropriate a	g. Use lab skills and nd usually erroneous	
Course Type	Lecture w	techniques and analysis of data and results ineffectively, leading generally to inap	ppropriate a	g. Use lab skills and nd usually erroneous	
Course Teaching		techniques and analysis of data and results ineffectively, leading generally to inal conclusions to real-world problems. Demonstrate ineffectiveness team-based organith laboratory component course	ppropriate a	g. Use lab skills and nd usually erroneous d presentational skills.	
· · · · · · · · · · · · · · · · · · ·	Activitie	techniques and analysis of data and results ineffectively, leading generally to inal conclusions to real-world problems. Demonstrate ineffectiveness team-based organith laboratory component course  Details	ppropriate a	g. Use lab skills and nd usually erroneous d presentational skills.	
Course Teaching	<b>Activitie</b> Lectures	techniques and analysis of data and results ineffectively, leading generally to inal conclusions to real-world problems. Demonstrate ineffectiveness team-based organith laboratory component course  Details	ppropriate a	g. Use lab skills and nd usually erroneous d presentational skills.  No. of Hours	
Course Teaching	Activitie Lectures Laborato	techniques and analysis of data and results ineffectively, leading generally to inal conclusions to real-world problems. Demonstrate ineffectiveness team-based organith laboratory component course  Details	ppropriate a	g. Use lab skills and nd usually erroneous d presentational skills.  No. of Hours  24	
Course Teaching	Activitie Lectures Laborato Tutorials	techniques and analysis of data and results ineffectively, leading generally to inal conclusions to real-world problems. Demonstrate ineffectiveness team-based organization laboratory component course  Details	ppropriate a	g. Use lab skills and nd usually erroneous d presentational skills.  No. of Hours  24  24  12	
Course Teaching & Learning Activities	Activitie Lectures Laborato Tutorials	techniques and analysis of data and results ineffectively, leading generally to inal conclusions to real-world problems. Demonstrate ineffectiveness team-based organith laboratory component course  Details	ppropriate a	g. Use lab skills and nd usually erroneous d presentational skills.  No. of Hours  24	
Course Teaching	Activitie Lectures Laborato Tutorials	techniques and analysis of data and results ineffectively, leading generally to inal conclusions to real-world problems. Demonstrate ineffectiveness team-based organization laboratory component course  Details  Y Self study	ppropriate and izational and	g. Use lab skills and nd usually erroneous d presentational skills.  No. of Hours  24  24  12	
Course Teaching & Learning Activities  Assessment Methods	Activitie Lectures Laborato Tutorials Reading	techniques and analysis of data and results ineffectively, leading generally to inal conclusions to real-world problems. Demonstrate ineffectiveness team-based organith laboratory component course  S  Details  Petails  Details  Seminars & continuous	ppropriate ai	g. Use lab skills and nd usually erroneous d presentational skills.  No. of Hours  24  24  12  100  Veighting in final	
Course Teaching & Learning Activities  Assessment Methods	Activitie Lectures Laborato Tutorials Reading Methods	techniques and analysis of data and results ineffectively, leading generally to inal conclusions to real-world problems. Demonstrate ineffectiveness team-based organization laboratory component course    Details	ppropriate ai	g. Use lab skills and nd usually erroneous d presentational skills.  No. of Hours  24  24  12  100  Veighting in final course grade (%)	
Course Teaching & Learning Activities  Assessment Methods	Activitie Lectures Laborato Tutorials Reading Methods Assignm Examina	techniques and analysis of data and results ineffectively, leading generally to inal conclusions to real-world problems. Demonstrate ineffectiveness team-based organization laboratory component course    Details	ppropriate ai	g. Use lab skills and nd usually erroneous d presentational skills.  No. of Hours  24  24  12  100  Veighting in final course grade (%)	
Course Teaching & Learning Activities  Assessment Methods	Activitie Lectures Laborato Tutorials Reading Methods Assignm Examina Laborato	techniques and analysis of data and results ineffectively, leading generally to inal conclusions to real-world problems. Demonstrate ineffectiveness team-based organith laboratory component course  S	ppropriate and izational and	g. Use lab skills and nd usually erroneous d presentational skills.  No. of Hours  24  24  12  100  Veighting in final course grade (%)  40	
Course Teaching & Learning Activities  Assessment Methods and Weighting  Required/recommended reading	Activitie Lectures Laborato Tutorials Reading Methods Assignm Examina Laborato S. S. Des	techniques and analysis of data and results ineffectively, leading generally to inal conclusions to real-world problems. Demonstrate ineffectiveness team-based organization laboratory component course    Details	ppropriate and izational and	g. Use lab skills and nd usually erroneous d presentational skills.  No. of Hours  24  24  12  100  Veighting in final course grade (%)  40	

BIOL3208 Food safety and	d quality management (6 credits)	Academic Year	2014
Offering Department	Biological 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 exposure to some key management concepts used that will succeed in the marketplace. To introduce students to business situations in food safety management.		
Course Contents & Topics	- The regulatory, social and business imperative for food safety Basic concepts in TQM - Statistical Process Control - Quality Function Deployment - Quality Function Deployment - Quality management standards (ISO 9000) - Development and implementation of a Hazard Analysis Critic ISO 22000 food safety management system/ supply chain appropriate in the food industry - Role of environmental management systems (ISO 14000) in the Intellectual Property issues in the food industry - Religious, ethical, and cultural food choices - Illustrative business case studies on food safety management	cal Control Point (HACCI bach) e food industry	P) plan (within ar
Course Learning Outcomes	On successful completion of this course, students should be able 1. Understand the historical development of government regulat 2. Be familiar with a set of management techniques applicable in 3. Be able to analyze food production problems and make record and safety.	ion of food safety.  n the food industry.	to improve quality
Pre-requisites	Pass in BIOL3201 Food chemistry or BIOL3203 Food microbiole	ogy	

Impermissible combination)					
Offer in 2014 - 2015	Y 1st	sem	Exam	nination	Dec
Offer in 2015 - 2016	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 quality management skills and techniques and analysis of data and results to draw appropriate and insightful conclusions to real-world problems. Demonstrate highly effective team-based organizational and presentational skills.				
	B Demonstrate substantial grasp of the subject matter covered. Show evidence of analytical and critical abilities and logical thinking with some evidence of competence in professional-level problem solving. Use 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.				
	С	Demonstrate general but incomplete grasp o critical abilities and logical thinking with lim management skills and techniques and analy erroneous conclusions to real-world problem presentational skills.	ited competence in professional sis of data and results to draw m	I-level problem noderately appro	solving. Use quality opriate but sometimes
	D	Demonstrate partial but limited grasp, with re Show some evidence of coherent and logical Use quality management skills and technique often erroneous conclusions to real-world pu skills of limited effectiveness.	thinking, but lacking competence s and analysis of data and results	in professional- is to draw some	level problem solving.
	Fail	Demonstrate little or no grasp, with retention of coherent and logical thinking, and minima management skills and techniques and analy and usually erroneous conclusions to real-word and presentational skills.	I competence in professional-le sis of data and results ineffective	evel problem : ely, leading gen	solving. Use quality erally to inappropriate
Course Type	Lecture-ba	ased course			
Course Teaching					
	Activitie	s	Details		No. of Hours
& Learning Activities	Activitie	s	Details		No. of Hours
		s	Details including presentation		
	Lectures				36
	Lectures Tutorials Group we				36 12
	Lectures Tutorials Group we	ork / Self study			36 12 30
& Learning Activities  Assessment Methods	Lectures Tutorials Group we Reading	ork / Self study	including presentation		36 12 30 100 Weighting in final
& Learning Activities  Assessment Methods	Lectures Tutorials Group we Reading Methods	ork / Self study	including presentation		36 12 30 100 Weighting in final course grade (%)
& Learning Activities  Assessment Methods	Lectures Tutorials Group we Reading Methods Assignment	ork / Self study ents	including presentation		36 12 30 100 Weighting in final course grade (%)
& Learning Activities  Assessment Methods and Weighting  Required/recommended reading	Lectures Tutorials Group we Reading  Methods  Assignme Examina Project re Jones, J.	ents tion eports M.: Food Safety (Eagan Press, 1992)	including presentation  Details  including presentation		36 12 30 100 Weighting in final course grade (%) 10 60 30
& Learning Activities  Assessment Methods and Weighting	Lectures Tutorials Group we Reading  Methods  Assignme Examina Project re Jones, J.	ork / Self study sents tion eports	including presentation  Details  including presentation		36 12 30 100 Weighting in final course grade (%) 10 60 30
& Learning Activities  Assessment Methods and Weighting  Required/recommended reading	Lectures Tutorials Group we Reading  Methods  Assignme Examina Project re Jones, J.  Mortimore	ents tion eports M.: Food Safety (Eagan Press, 1992)	including presentation  Details  including presentation  al Approach (Chapman and	d Hall, 1994	36 12 30 100 Weighting in final course grade (%) 10 60 30
& Learning Activities  Assessment Methods and Weighting  Required/recommended reading	Lectures Tutorials Group we Reading  Methods  Assignme Examina Project re Jones, J.  Mortimore Forsythe,	ents tion eports M.: Food Safety (Eagan Press, 1992) e, S. and Wallace, C.: HACCP: A Practic	including presentation  Details  including presentation  al Approach (Chapman and	d Hall, 1994	36 12 30 100 Weighting in final course grade (%) 10 60 30

BIOL3209 Food and nutrient analysis (6 credits)  Academic Year 2014				
Offering Department	Biological Sciences	Quota	70	
Course Co-ordinator	Dr M F Wang, Biological Sciences (mfwang@hku.hk)			
Teachers Involved	Dr M F Wang, Biological Sciences Dr J C Y Lee, Biological Sciences			
Course Objectives	To introduce basic principles and provide practical training in food an to understand the principles behind analytical instruments used in analyze major and minor food components as well as some food adult	food analysis. To t		
Course Contents & Topics	The key concepts in professional food analysis in an industry context will be introduced. Basic analytical techniques for macronutrients (e.g. protein, carbohydrate and fats), micronutrients (vitamins and minerals) and adulterants in food will be covered. A variety of classical and instrumental techniques used in food 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:  1. Understand the basic principles of food and nutrient analysis.  2. Be familiar with a variety of classical and instrumental analytical techniques.  3. Understand the principles behind analytical instruments associated with food.  4. Be able apply their knowledge and laboratory skills in novel situations to measure and analyze the macronutrient and micronutrient of food products.  5. Be able to select and justify an appropriate analytical technique to solve practical food analysis problems.			
Pre-requisites (and Co-requisites and	Pass in BIOL3201 Food chemistry			

Offer in 2014 - 2015	Y 1s	t sem	Examinatio	n Dec		
Offer in 2015 - 2016	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.				
	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 abilities and logical thinking with li techniques and analysis of data and resu	asp of the subject matter covered. Show some imited competence in professional-level proble lits to draw moderately appropriate but sometimately effective team-based organizational and p	m solving. Use lab skills and nes erroneous conclusions to		
	D	Show some evidence of coherent and log Use lab skills and techniques and analyst	with retention of some relevant information, of pical thinking, but lacking competence in profes sis of data and results to draw sometimes app monstrate team-based organizational and pre	sional-level problem solving. ropriate but often erroneous		
	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.					
	_	Lecture with laboratory component course				
Course Type	Lecture v	vith laboratory component course				
Course Teaching	Lecture v	, .	Details	No. of Hours		
Course Teaching		es	Details	No. of Hours		
••	Activitie	es S	Details			
Course Teaching	Activitie	es S Dory	Details	24		
	Activities Lectures Laborate Tutorials	es S Dory	Details	24 24		
Course Teaching	Activities Lectures Laborate Tutorials	es Sorry Sorry Solf Study	Details Details	24 24 6		
Course Teaching & Learning Activities  Assessment Methods	Activities Lectures Laborate Tutorials Reading	es s pory s / Self study		24 24 6 100 Weighting in final		
Course Teaching & Learning Activities  Assessment Methods	Activities Lectures Laborato Tutorials Reading	ess S S S S S S S S S S S S S S S S S S	Details	24 24 6 100 Weighting in final course grade (%)		
Course Teaching & Learning Activities  Assessment Methods	Activitie Lectures Laborate Tutorials Reading Methods Assignm Examina Y. Pome ed.)	ess Sory Sory Sory Sory Sory Sory Sory Sory	Details	24 24 6 100 Weighting in final course grade (%) 40 60 nd Reinhold, 1994, 3rd		
Course Teaching & Learning Activities  Assessment Methods and Weighting  Required/recommended reading	Activities Lectures Laborato Tutorials Reading  Methods Assignm Examina Y. Pome ed.) S. S. Nie	ess Sory Sory Sory Sory Sory Sory Sory Sory	Details  practical work & assignment sis: Theory and Practice (Van Nostra	24 24 6 100 Weighting in final course grade (%) 40 60 nd Reinhold, 1994, 3rd		

BIOL3210 Grain production	n and utilization (6 credits)	Academic Year	2014	
Offering Department	Biological 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 indust and in human health and nutrition.			
Course Contents & Topics	- Global grain production and consumption - The Green Revolution and its aftermath - International grain trade - Wheat: flour milling, dough rheology, the baking process, - Wheat: quality of Asian products including steamed bread - Wheat: small-scale tests for quality - Rice: nutritional quality, consumer preferences, milling, qu - Maize: products of wet milling, animal feed development - Biofuels focusing on bioethanol - Illustrative business case studies on the grain processing	and noodles ality, quality testing, products		
Course Learning Outcomes	On successful completion of this course, students should be 1. Understand the major production, import, and export patt 2. Understand the technology behind the production of grain 3. Understand the scope and nature of professional level que 4. Appreciate the constraints to global food sufficiency. 5. Appreciate the ethical issues behind the diversion of grain the d	erns that support the global un- h-based foods. Juality testing for grain product	s.	
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in any level 2 BIOL course			
Offer in 2014 - 2015	Y 1st sem	Examination	Dec	
Offer in 2015 - 2016	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.			
	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	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.			
	D	Demonstrate partial but limited grasp, with Show some evidence of coherent and logica Use lab skills and techniques and analysis conclusions to real-world problems. Demo effectiveness.	al thinking, but lacking competence in proof data and results to draw sometimes	ofessional-level problem solving. appropriate but often erroneous	
	Fail	Demonstrate little or no grasp, with retention coherent and logical thinking, and minimal techniques and analysis of data and results conclusions to real-world problems. Demons	competence in professional-level prob ineffectively, leading generally to inap	lem solving. Use lab skills and propriate and usually erroneous	
Course Type	Lecture-ba	sed 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 (%)	
	Examinati	on		70	
	Project reports		including presentation	30	
Required/recommended reading and online materials	pages. Els	dia of Grain Science, edited by Wrigle evier, Oxford. (selected chapters only lings to be provided		E (2004) 3 Volumes, 1,700	
Course Website	http://mood	dle.hku.hk/			
Additional Course Information	This sours	e will be offered subject to a minimum	طوائور و لومو بوطوس منفو ووالوبوم	ility of topoboro	

<b>BIOL3211 Nutrigenomics (</b>	6 credits)	Academic Year	2014	
Offering Department	Biological Sciences	Quota	40	
Course Co-ordinator	Dr K C Tan-Un, Biological Sciences (kctanun@hku.hk)			
Teachers Involved	Dr K C Tan-Un, Biological Sciences			
Course Objectives	Recent advances in the understanding of the human genome have resulted in the emergence of a new science 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 diet related diseases. It explains the role of nutrition at the molecular level and the concepts of nutrigenomics and nutrigenetics.			
Course Contents & Topics	Concepts of nutrigenomics, nutrigenetics, metabolomics and nutritic Regulation of gene expression; Single Nucleotide Polymorphisms at Overview of lipid metabolism; cholesterol metabolic pathway; hyper Relevance of folate, vitamin B12; hyperhomocysteinemia and gene Epigenetics, Barker s hypothesis, influence of maternal nutrition in predisposition, candidate genes like leptin, FTO and other hormone Polyunsaturated fatty acid and their roles in the control of gene exoxidation pathways; Inborn errors of metabolism in the context of genetic mutations and	and relation to disease dipidaemia, LDL recept polymorphisms in di- fetal gene expression is involved in the cont pression example lip	otor mutations. seases. n. Obesity, genetion rol of appetite ogenesis and lipion	
Course Learning Outcomes	On successful completion of this course, students should be able to 1. Explain the principles of the control of gene expression. 2. Demonstrate understanding of the role of metabolic pathways and disease. 3. Discuss how genetic variations are used to study the role of gene 4. Explain the relationship between genotype, epigenetics and diet-5. Critically evaluate current theories of personalized nutrition bases	in relationship to diet es in nutrient-related or related diseases.	cellular processes	
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in BIOC2600 Basic biochemistry or BIOL2220 Principles of bi	ochemistry		
Offer in 2014 - 2015	Y 2nd sem	Examination	May	
Offer in 2015 - 2016	Υ			
Course Grade	A+ to F			
Grade Descriptors	A Demonstrate thorough grasp of the subject matter covered. Show problem solving skills. Show excellent ability to critically analyze			

		appropriate conclusions. Demonstrate highl	y effective organization and writing skills.			
	В	B Demonstrate substantial grasp of the subject matter covered. Show substantial ability of knowledge integ problem solving skills. Show substantial ability to critically analyze and interpret scientific data and draw a conclusions. Demonstrate effective organization and writing skills.  C Demonstrate general and acceptable grasp of the subject matter covered. Show acceptable ability of k integration and problem solving skills. Show moderate ability to analyze and interpret scientific data and draw conclusions. Demonstrate moderate organization and writing skills.  D Demonstrate marginal grasp of the subject matter covered. Show limited ability on knowledge integrated problem solving skills. Show limited ability to analyse and interpret scientific data. Demonstrate basic or and writing skills.				
	С					
	D					
	Fail	Demonstrate little or no grasp, with little retention of information of the subject matter covered. Show lack of cohe and logical thinking, and minimal evidence in problem solving. Fail to integrate information and identify proble Show little or minimal ability to analyze and interpret scientific data and draw conclusions. Demonstrate progranization and writing skills.				
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 (%)		
	Assignments			20		
	Examination			60		
	Test			20		
Required/recommended reading and online materials	Lehninger Principles of Biochemistry Ordovas: Nutrigenetics and Nutrigenomics. Wiley. 2004 Brigelius-Flohe, Joost: Nutritional Genomics. Wiley. 2006. Rimbach, Fuchs, Packer: Nutrigenomics, CRC Press. 2005 Journals in Nutrition, Molecular Biology and Genetics					
Course Website	http://moo	dle.hku.hk/				
Additional Course Information	This cours	se will be offered subject to a minimun	n enrollment number and availabili	ty of teachers.		

BIOL3301 Marine biology	(6 credits)		Academic Year	2014		
Offering Department	Biologica	l Sciences	Quota	40		
Course Co-ordinator	Dr M Yas	Dr M Yasuhara, Biological Sciences (yasuhara@hku.hk)				
Teachers Involved	Prof Y Sa Prof R S	suhara, Biological Sciences adovy, Biological Sciences S Wu, Biological Sciences gatesen, Biological Sciences				
Course Objectives	diversity benefits v	To develop a basic understanding and appreciation of the field of marine biology, including the fascinating diversity of marine life, their function, ecology and inter-relationships. Contemporary issues including the benefits we derive from marine biological resources and threats to their long-term sustainability will also be discussed with case studies highlighting key issues.				
Course Contents & Topics	temperati 2. Import mammals 3. Major mangrove 4. Exploit	nysical and chemical environments (e.g., light, oure, pH, dissolved oxygen, nutrients) and how the tant groups of marine organisms (e.g., phytops) and marine food web marine habitats and ecosystems (e.g., interies) atton of marine biological resources (e.g., fisherimporary issues (e.g. climate change, marine poll	ese may affect the marine bic plankton, zooplankton, benth tidal, benthic, pelagic, deep es and bioactive compounds)	ta os, nekton, marin sea, coral reefs		
Course Learning Outcomes	1. Demor 2. Recogn 3. Apprec	On successful completion of this course, students should be able to:  1. Demonstrate a basic understanding of the diversity and function of marine biota.  2. Recognize the interactions of marine biota and their environments.  3. Appreciate the importance of marine ecosystems and the threats of human activities on their long-terr sustainability as well as possible solutions.				
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in B	SIOL2306 Ecology and evolution or ENVS2002 E	nvironmental data analysis			
Offer in 2014 - 2015	Y 2n	d sem	Examination	May		
Offer in 2015 - 2016	Υ					
Course Grade	A+ to F	A+ to F				
Grade Descriptors	Α	Demonstrate thorough mastery at an advanced level of course learning outcomes. Show strong analytical and of thought, and ability to apply knowledge to a wide range				

	В	the course learning outcomes. Show evid	road range of knowledge and skills required for lence of analytical and critical abilities and logic amiliar situations. Apply effective organizational a	cal thinking, and ability to
	С	learning outcomes. Show evidence of sor	nmand of knowledge and skills required for atta ne analytical and critical abilities and logical thin ly moderately effective organizational and preser	nking, and ability to apply
	D	outcomes. Show evidence of some cohe	of knowledge and skills required for attaining so rent and logical thinking, but with limited analy to solve problems. Apply limited or barely effe	rtical and critical abilities.
	Fail	outcomes. Lack of analytical and critical a	mand of knowledge and skills required for atta bilities, logical and coherent thinking. Show very n and presentational skills are minimally effective	little or no ability to apply
Course Type	Lecture w	ith laboratory component course		
Course Teaching & Learning Activities	Activities	S	Details	No. of Hours
	Lectures			24
	Field work		field trip, laboratory practical & tutorials	30
	Reading / Self study			100
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)
	Assignments			20
	Examination			80
Required/recommended reading and online materials	Press Nybakken Benjamin H. V. Thui	, J.W. and Bertness, M.D., 2004. Cummings.	biodiversity, ecology 2nd edition. 515  Marine Biology: An Ecological App Dceanography (Prentice Hall, 2001, 9th I View (Benjamin Cummings, 2000)	proach, 6th Edition,
Course Website	http://www.biosch.hku.hk/ecology/lsc/			

BIOL3302 Systematics an	d phylogen	etics (6 credits)	Academic Year	2014			
Offering Department	Biological	Sciences	Quota	60			
Course Co-ordinator	Prof R M k	Saunders, Biological Sciences (saunders@hku.hk)					
Teachers Involved	Prof R M P	Saunders, Biological Sciences					
Course Objectives	To give students an understanding of the principles of systematics and phylogenetics and an appreciation of current trends and controversies. Systematics forms an invaluable grounding for many fields of biology (including anatomy, ecology, population biology and evolutionary biology), and enables the integration of a wide range of techniques (including anatomy, biochemistry, chemistry, molecular biology, cytology, palaeontology and ethology).						
Course Contents & Topics	cladistics anatomy, complexity nomenclat	Currrent classificatory theories: phenetic systematics (classifications based on overall resemblances) and cladistics (evolutionary reconstruction). The species concept. Sources of taxonomic data: morphology & anatomy, biochemistry, chemistry, molecular biology, cytology, and ethology. Causes of taxonomies complexity: environmental factors; hybridization; breeding systems. Principles of nomenclature. Laboratory sessions will be aimed at illustrating taxonomic procedures and problems; students will not be expected to memorize large numbers of scientific names.					
Course Learning Outcomes	1. Explain methods of 2. Describ sister-grou 3. Evaluat 4. Recogn 5. Unders	asful completion of this course, students should be ab taxon concepts (with particular reference to spec can be applied below the species level. be the principles behind maximum parsimony method up relationships, out-group comparison, homoplasy are the diversity of sources of taxonomic data, and explained the main causes of taxonomic complexity, and idea tand the principles of nomenclature in order to interest validly publish new names.	les) and show how mult ls of phylogenetic recons and the assessment of clad ain the importance of spe entify appropriate solutions	truction (includin le stability). cific data source: s.			
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in BI	OL1309 Evolutionary diversity and any level 2 BIOL of	course				
Offer in 2014 - 2015	Y 1st	Y 1st sem Examination Dec					
Offer in 2015 - 2016	Υ	Υ					
Course Grade	A+ to F						
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.						
	B Demonstrate substantial command of knowledge required for attaining most of the course learning outco evidence of some background reading and use of named examples. Show evidence of critical abilities a thinking. Apply effective presentation skills. Demonstrate use of data and results to draw appropriate and conclusions. Show evidence of general integration of appropriate theories, principles, evidence and techniq						

	С	Demonstrate general but incomplete con learning outcomes, with evidence of limit some critical abilities and logical thinking. use of data and results to draw approp appropriate theories, principles, evidence	ted background reading and use of Apply moderately effective present riate and insightful conclusions. S	of named examples. Show evidence of tation skills. Demonstrate mostly correct
	D	Demonstrate partial but limited command outcomes, with insufficient evidence of be critical abilities and logical thinking. Appl results to draw appropriate and insightful principles, evidence and techniques.	ackground reading and use of nam ly limited presentation skills. Demo	ed examples. Show evidence of limited onstrate limited ability to use data and
	Fail	Demonstrate little or no evidence of comoutcomes, with no evidence of backgroun abilities and logical thinking. Presentation draw appropriate conclusions. Little or no techniques.	d reading or use of named exampl al skills are minimally effective or in	les. Show little or no evidence of critical neffective. Misuse of data and results to
Course Type	Lecture w	ith laboratory component course		
Course Teaching	Activities		Details	No. of Hours
& Learning Activities	Lectures			24
	Laboratory			24
	Project work			12
	Reading / Self study			100
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)
	Assignments			15
	Examination			70
	Laboratory reports			15
Required/recommended reading and online materials		P. D. Ashlock: Principles of Systemdet al.: Plant Systematics - A Phylog		
Course Website	http://www	v.biosch.hku.hk/ecology/lsc/		

<b>BIOL3303 Conservation ec</b>	ology (6 credits)	Academic Year	2014		
Offering Department	Biological Sciences	Quota	40		
Course Co-ordinator	Dr T C Bonebrake, Biological Sciences (tbone @hku.hk)				
Teachers Involved	Dr T C Bonebrake, Biological Sciences Prof Y Sadovy, Biological Sciences Dr T Vengatesen, Biological Sciences Dr L Karczmarski and TBC, Biological Sciences				
Course Objectives	To introduce students to the theory and practice of conservation and to provide students with a thorough understanding of practical, economic and management skills required for proficiency in conservation biology. Our ultimate aim is to promote an understanding of the natural biodiversity, the threats to it, and the best ways to manage them. We hope these will be your aims too, and that you will be able to use the skills and knowledge you learn from the course to reduce the local, regional and global loss of biodiversity.				
Course Contents & Topics	Among the many environmental issues, the most serious is the increal loss is irreversible on a human timescale and will reduce the opgenerations. Conservation Biology/Ecology is the science of preser also provides insights to the many benefits and services that nature management options to sustain ecological integrity and production orientated, multidisciplinary science which, like medicine, has built-in to a doctor, it matters whether the patient lives or dies. It is also a elements from ecology, environmental science, forestry, resource man are conservation. Our teaching focuses on biodiversity conservation, climate change, the key theoretical underpinning of biodiversity conservation legislation and economics. We emphasis on the integrated that are required to practice conservation. Our problem based learn actively participate in their group project/class room debate by researce.	tions available to a ving biological diver re offers and explor n. It is an inexact, values: to a conservation rew science, nagement and many and research related conservation issues onservation and ar tion of knowledge, sing approach will re	all future human sity. This course es strategies for applied, missionation biologist, as bringing together other fields.  I to biodiversity associated with introduction to skills and abilities		
Course Learning Outcomes	On successful completion of this course, students should be able to:  1. Develop a framework for critical thinking about biodiversity, environ 2. Understand why species are becoming extinct and predict which or 3. Understand the importance of the threat of tropical deforestation, habitat fragmentation in species extinction, and explain the main foloss.  4. Understand the principles of population viability analysis, the bemanagement and the role of ex situ conservation, ecological restorations. Outline the legal and administrative basis for conservation in Hong 6. Appreciate the roles and relationships of economic, social aconservation of biodiversity.	nes will be most vuln marine and coastal rces behind habitat asis of single-spec on and reintroduction Kong and the world.	erable. degradation, and and biodiversity des conservation in conservation.		
Pre-requisites (and Co-requisites and	Pass in BIOL2306 Ecology and evolution				

Offer in 2014 - 2015	Y 2nd sem		Examin	nation May		
Offer in 2015 - 2016	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.				
	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, 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				
	С					
	D					
	Fail	Demonstrate little or no evidence of com outcomes. Lack of analytical and critical a knowledge to solve problems. Organization	bilities, logical and coherent thinking. Sh	ow very little or no ability to apply		
Course Type	Lecture v	vith laboratory component course				
Course Teaching	Activitie	9S	Details	No. of Hours		
& Learning Activities	Lectures	3		24		
	Field wo	rk		10		
	Group work			8		
	Tutorials			14		
	Reading / Self study			100		
Assessment Methods and Weighting	Method	S	Details	Weighting in fina course grade (%		
	Assignm	nents		20		
	Examination			60		
	Presentation		group presentation	10		
	Test			10		
Required/recommended reading and online materials	R. B. Primack: Essentials of Conservation Biology (Sinauer, 2006, 4th ed.) V. D. Fred: Conservation biology [electronic resource]: foundations, concepts, applications (Springer 2008) M.L. Hunter and J.P. Gibbs: Fundamentals of Conservation Biology (Blackwell, 2007, 3rd Ed) William J. Sutherland: The Conservation Handbook: Research, Management and Policy (Blackwell Science, 2008) NIL					
Course Website	http://www.biosch.hku.hk/ecology/lsc/					

Offering Department Course Co-ordinator	Biological Sciences  Prof D Dudgeon, Biological Sciences (ddudgeon@hku.hk)  Prof D Dudgeon, Biological Sciences	Quota	30
	, ,		
	Prof D Dudgeon, Biological Sciences		
Teachers Involved			
Course Objectives	This course introduces freshwater science by integrating the phys and their drainage basins in the context of sustaining human live and management of lakes and maintenance of water quality are coillustrate the principles of river science and human use of drainag conservation of freshwater biodiversity in Asia in the context ecosystems, habitat degradation and water scarcity.	elihoods and biodiversi nsidered also. Case sto e basins. Emphasis wil	ty. Conservation udies are used to be placed upon
Course Contents & Topics	The amount of water on Earth is fixed. Less than 0.01% of the wo water hosts 10% of the Earth's species. Global water use has increaster than the Earth's population; many people in Asia already fathe physicochemical processes involved in the hydrological cycle well as their seasonal fluctuations, and describes the main longing and their floodplains. Energy flows in freshwater ecosystems are detransfer of materials between water and land and the relative im versus energy derived from detrital inputs from the land. The ran fresh waters is introduced and their functional roles explained, and common Hong Kong species in field trips and laboratory sess freshwater ecosystems and the role they play in sustaining live causes and consequences of human modification of fresh waters, aquatic biodiversity. Finally the range of management strategies us on freshwater ecosystems and maintain water quality is introduced	eased 300% since 195 ce water stress. This cand flow of water in draudinal changes that or escribed with particular portance of aquatic prige of organisms associated to the constant of the c	O and is growing ourse introduces inage basins, as cour along rivers reference to the mary production ciated with Asian amiliar with some of humans on ogether with the r conservation of
Course Learning Outcomes	On successful completion of this course, students should be able to	):	

	influence of 2. Describ ecosystem 3. Describ freshwater	e the global water cycle, the main soft land-water interactions on aquatic pie the composition of the freshwater is, and identify some of the common are the results of modification of frest biodiversity in Asia, explain why frest lement strategies used to reduce or m	roductivity. biota (major groups) and t nimals that occur in Hong I hwater ecosystems by hu water biota are vulnerable	their functional Kong fresh wat mans, list the	roles in aquatic ers. main threats to			
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in Bl	OL2102 Biostatistics and BIOL2306 E	cology and evolution					
Offer in 2014 - 2015	Y 1st	sem	Exa	amination	Dec			
Offer in 2015 - 2016	Υ							
Course Grade	A+ to F	+ to F						
Grade Descriptors	A Evidence of original logical (or coherent) thought, strong analytical (or critical) abilities and a thorough g subject as demonstrated by background reading and excellent use of named (organism) examples. Sho presentational, analytical skills and/or lab/field skills, and substantial knowledge of general freshwater bid selected taxa. Excellent or outstanding (for A+) work relative to what is required at degree level.			oles. Show excellent				
	В	Evidence of analytical (or critical) abilities al grasp of the subject as demonstrated by ba presentational, analytical and/or lab/field ski Work more than sufficient for what is required	ckground reading and use of nar lls, and knowledge of general fre	med (organism) ex	amples. Show good			
	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 knowledg organization and/or excessive irrelevancy. lab/field techniques, or any knowledge of fres	Little or no evidence of familiari	ty with relevant re	eading material and			
Course Type	Lecture wi	th laboratory component course						
Course Teaching	Activities	<b>)</b>	Details		No. of Hours			
& Learning Activities	Lectures				26			
	Laborator	у	project and laboratory w trips to local stream wetlands		40			
	Reading / Self study				100			
Assessment Methods and Weighting	Methods		Details		eighting in final ourse grade (%)			
	Assignme	ents			30			
	Examinat	ion			60			
	Laborator	y reports			10			
Required/recommended reading and online materials	The Mekor An online information river health	Laboratory reports 10  Allan, J.D. & Castillo, M.M. (2007). Stream Ecology. Springer.  The Mekong River Awareness Kit (RAK) http://www.mrcmekong.org/RAK/html/rak_frameset.html  An online training tool developed by an international team (including the course coordinator) that contains information on the physical and biological features of rivers, and shows how human livelihoods depend on iver health.						
O W 1 . %		ferences available in HKU library will b	e provided for each lecture	on the course	website.			
Course Website		.biosch.hku.hk/ecology/lsc/						
Additional Course Information	This cours	e will be offered subject to a minimum	enrollment number and av	allability of tea	his course will be offered subject to a minimum enrollment number and availability of teachers.			

<b>BIOL3314 Plant structure</b>	and evolution (6 credits)	Academic Year	2014		
Offering Department	Biological Sciences Quota 30				
Course Co-ordinator	Prof R M K Saunders, Biological Sciences (saunders@hku.hk)				
Teachers Involved	Prof R M K Saunders, Biological Sciences				
Course Objectives	To survey the form and function of the vascular plant body, with particular emphasis on the evolutionary significance of structures. This course forms a basis for understanding plant physiology, ecology, systematics and phylogenetics.				
Course Contents & Topics	explanations for their diversity and discussions of the value of s phylogeny. Information on plant structure will be integrated developmental genetics and taxonomic relationships derived from r	The course will investigate various cell, tissue and organ types in the vascular plant body, with functional explanations for their diversity and discussions of the value of such knowledge in understanding plant phylogeny. Information on plant structure will be integrated with our current understanding of developmental genetics and taxonomic relationships derived from molecular phylogenetic research. Topics such as food storage, strength, water conduction, growth and development, pollination, fertilization, fruit			
Course Learning Outcomes	On successful completion of this course, students should be able to:				
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	(such as the 2. Describer 3. Describer 4. Integrate 5. Describer 4. Describer 5. Describer 6. Explain	ise the main plant cell types and explain exylem and phloem).  e the developmental changes that occupe the structure, function and developmental explain the structure of the genetic control of fice the structure of fruits from a function of the the structure of fruits from a function of the flower.  how seeds develop after fertilization germination patterns.	or in primary tissues with the onset ent of secondary vegetative structureral development with the evolution all perspective, and recognise how	of secondary growth. res (wood and bark). of organ diversity. w these structures are	
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in Bl	Pass in BIOL1309 Evolutionary diversity and any level 2 BIOL course			
Offer in 2014 - 2015	Y 2nd	2nd sem Examination May			
Offer in 2015 - 2016	Υ				
Course Grade	A+ to F				
Grade Descriptors	A	Demonstrate thorough mastery at an advance course learning outcomes, with evidence of evidence of significant critical abilities and lo effective use of data and results to draw approximately.	extensive background reading and use or gical thinking. Apply highly effective prese priate and insightful conclusions.	of named examples. Show entation skills. Demonstrate	
	В	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.			
	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.			
	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.			
	Fail	Demonstrate little or no evidence of comman outcomes, with no evidence of background re abilities and logical thinking. Presentational sk draw appropriate conclusions.	ading or use of named examples. Show litt	le or no evidence of critical	
Course Type	Lecture wi	th laboratory component course			
Course Teaching	Activities	3	Details	No. of Hours	
& Learning Activities	Lectures			24	
	Laboratory			36	
	Reading /	Self study		100	
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	
	Examinat	ion		70	
	Laborator	y reports		30	
Required/recommended reading and online materials	P.H. Rave	Laboratory reports  P. Rudall: Anatomy of Flowering Plants, 3rd ed. Cambridge Univ. Press (2007) P.H. Raven, R.F. Evert & S.E. Eichhorn: Biology of Plants, 7th ed. Freeman (2005) A list of additional reading material will be provided during the course.			
Course Website	http://www	.biosch.hku.hk/ecology/lsc/			
Additional Course Information	This cours	e will be offered subject to a minimum e	enrollment number and availability	of teachers.	

<b>BIOL3318 Experimental in</b>	Academic Year	2014		
Offering Department	Biological Sciences Quota 20			
Course Co-ordinator	Prof G A Williams, Biological Sciences (hrsbwga@hku.hk)			
Teachers Involved	Prof G A Williams, Biological Sciences			
Course Objectives	To examine the communities of coastal systems: their distribution, regulate them. This course will examine, using an experimental appropriate shores and the deterministic and stochastic processes that create a will be used as examples but comparisons will be drawn from the coa	oach, patterns exhibind sustain them. Ho	ted by a range of	
Course Contents & Topics	The first part of this course describes shores of the marine to brackish water continuum and the communities found on them. Lectures will cover the physical environment of the intertidal (e.g. tides; waves; geological and hydrological processes) the resultant variations in exposure and shore types and consequent distribution of animals and algae on these shores (vertical and horizontal zonation patterns) with specific Hong Kong examples. The second part of the course uses an experimental approach (e.g. sampling methodology; manipulative techniques; experimental design and data analysis) to investigate the factors (e.g. predation; herbivory; competition; disturbance; succession; patchiness and recruitment; supply side ecology) that structure these shores, with particular focus on rocky intertidal shores.			
Course Learning Outcomes	On successful completion of this course, students should be able to:  1. Describe the physical environmental factors (e.g., waves, tides) shaping the intertidal environment and how they interact with geographic features to produce different kinds of shores (e.g., sandy shores, mangroves).			
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	<ol> <li>Understand the factors limiting species distribution patterns on the vertical intertidal gradi appreciate methods to measure and investigate these patterns.</li> <li>Identify and quantify the distribution of a variety of local species on different Hong Kong shores.</li> <li>Review, critique and design experimental studies to investigate patterns (e.g., zonation) and precision (e.g., herbivory, competition) in intertidal areas.</li> <li>Explain the role of biological processes (e.g., predation, succession) and their interaction physical environment in shaping intertidal communities.</li> <li>Plan, design, execute, analyse and present a simple experimental study on intertidal ecology.</li> </ol>						
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in BI	Pass in BIOL2102 Biostatistics or BIOL3301 Marine biology					
Offer in 2014 - 2015	Y 2nd	Isem		Examination	May		
Offer in 2015 - 2016	Υ						
Course Grade	A+ to F						
Grade Descriptors	Evidence of original, logical (or coherent) thought, strong analytical and critical abilities and a thorough grasubject as demonstrated by background reading and excellent use of named (organism) examples. Show presentational, analytical skills and/or lab/field skills, and demonstrate substantial knowledge of general ecology and excellent experimental design and analysis skills.  B Evidence of analytical (or critical) abilities and logical (or coherent), but not necessarily original, thinking grasp of the subject as demonstrated by background reading and use of named (organism) examples. She presentational, analytical and/or lab/field skills, and demonstrate knowledge of general intertidal ecology a experimental design and analysis skills.				nples. Show excellent of general intertidal nal, thinking, a good xamples. Show good		
	С	Evidence of some analytical (or critical) abilities and logical (or coherent) thinking with an adequate (but incomplete) grasp of the subject, but little or no evidence of original thinking, limited background reading and use of named (organism) examples. Show fair presentational, analytical and/or lab/field skills, and demonstrates some knowledge of general intertidal ecology and adequate abilities of experimental design and analysis.					
	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. Show insufficient evidence of background reading, or familiarity with lab/field techniques. Poor knowledge of general intertidal ecology and misunderstanding of experimental design and analysis.						
	Fail	Evidence of poor or inadequate knowledge and understanding of the subject, and a lack of coherenc organization and/or excessive irrelevancy. Limited or no evidence of familiarity with relevant reading mate lab/field techniques, or knowledge of general intertidal ecology, and misuse of experimental design and skills.					
Course Type	Lecture wi	ith laboratory component course					
Course Teaching	Activities	S	Details		No. of Hours		
& Learning Activities	Lectures				16		
	Field wor	k	field trip/project work	<	28		
	Project work				6		
	Tutorials				4		
	Reading / Self study				100		
Assessment Methods and Weighting	Methods	·	Details		Veighting in final course grade (%)		
	Assignments				40		
	3						
	Examinat	tion			60		
Required/recommended reading and online materials	Examinat Morton, B	tion . & Morton, J.: The Seashore Ecology & Williams, G.A. & Trowbridge, C.D.:			ess, 1983)		
reading	Morton, B. Little, C. & 2009)	. & Morton, J.: The Seashore Ecology			ess, 1983)		

<b>BIOL3319 Terrestrial ecol</b>	ogy (6 credits)	Academic Year	2014			
Offering Department	Biological Sciences Quota 30					
Course Co-ordinator	Dr B Guenard, Biological Sciences (bguenard@hku.hk)					
Teachers Involved	Dr B Guenard, Biological Sciences					
Course Objectives	To enable motivated students to acquire the knowledge and ski terrestrial ecology.	Is needed to solve	real problems in			
Course Contents & Topics	This course will focus on the ecology of terrestrial habitats. The emptropical East Asia, but the course will also include an overview of scale. Students will first learn about the geological history of the land broad distribution of major terrestrial ecosystems in Tropical East Adifferent important processes including herbivory, carnivory, pollinat terrestrial ecosystems. The second half of the course will start with nowadays and the important process of ecological succession. Forests can be restored will then be introduced. Two other major threatien invasive species and wildfire will also be addressed. The course will as problem-based learning exercises. The practical component the basic field techniques used in terrestrial ecology, including veget small mammal trapping, the use of infrared-triggered cameras to sand methods for quantifying invertebrate abundance.	f patterns and proce of mass on earth, the basia. Then, students with side of the degraded terreseasts to terrestrial ecourse content is delivered the course will introduce the course will introduce the course will only the course will be course wil	sees on a global piogeography and will begin to learn and energy flow in strial ecosystems and how tropical systems including ed by lectures as oduce students to pmmunity studies,			

Course Learning Outcomes	On succes	ssful completion of this course, stude	nts should be able to:		
	state. 2. Unders and methods. Plan and	stand the patterns and processes of tand the various threats to terrestrial ods to manage and restore degraded and conduct baseline study of terrestrial p the skill to be an active learner thro	ecosystems, methods to reduce terrestrial ecosystems.	the impac	et of those threats
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in B	IOL3303 Conservation ecology			
Offer in 2014 - 2015	Y 2nd	d sem	Exami	nation	May
Offer in 2015 - 2016	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 abilities and logical thinking, with evidence of thought, ability to integrate and synthesize information, and ability to apply knowledge to a wide range of a familiar and unfamiliar situations. Apply highly effective presentational skills. Strong evidence of clear attentional thoughtful and reflective thinking.				n evidence of original de range of complex,
	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, 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.			
	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 presentational skills. 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. Show limited ability to apply knowledge to solve problems. Apply limited effectiveness in presentational skills. Lack of attention to thoughtful and reflective thinking.				
	Fail	Demonstrate little or no evidence of com outcomes. Lack of analytical and critical al knowledge to solve problems. Organization	bilities, logical and coherent thinking. SI	how very little	or no ability to apply
Course Type	Lecture w	ith laboratory component course			
Course Teaching	Activitie	s	Details		No. of Hours
& Learning Activities	Lectures				24
	Laborato	ry	laboratory & field work		24
	Tutorials	•			14
	Reading	/ Self study			100
Assessment Methods and Weighting	Methods	·	Details		Veighting in final course grade (%)
	Assignme	ents			50
	Examina	tion			50
Required/recommended reading and online materials	Dudgeon Kong)	Corlett R.T.: The Ecology of Tropical East Asia (Oxford University Press, 2009).  Dudgeon D. and Corlett R. T.: Ecology and Biodiversity of Hong Kong (Friends of the Country Parks, Hong			
Course Website	http://wwv	v.biosch.hku.hk/ecology/lsc/			
Additional Course Information		se will be offered subject to a minimul	m enrollment number and availa	ability of tea	achers.
				,	

BIOL3320 The biology of m	arine mammals (6 credits)	Academic Year	2014	
Offering Department	Biological Sciences Quota 30			
Course Co-ordinator	Dr L Karczmarski, Biological Sciences (leszek@hku.hk)			
Teachers Involved	Dr L Karczmarski, Biological Sciences			
Course Objectives	Few other groups of animals have captured the public's imagination the whales and dolphins have. This course covers the evolutionary to conservation of marine mammals: whales, dolphins and porpoises (pinnipeds), manatees and dugongs (sirenians) and sea otters. Stude ecology of mammalian life in the aquatic environment, their role in the momentary and socio-ecology, and the current threats to these animals in the second	piology, ecology, be (cetaceans), seals dents will learn to un narine ecosystem, th	ehaviour, and and walruses inderstand the eir behavioural	
Course Contents & Topics	The course begins with an overview of marine mammal species and the review of the various adaptations that have evolved to meet the chall Next, the course discusses the life history, reproductive strategies, economic mammals, highlighting the similarities and differences betwee diverse group of animals. This is followed by sessions on behaviour discuss animal movement, diving and ranging behaviour, foraging strategies animals. The course concludes with a discussion of human influences examples of critically endangered species and populations, and a review strategies; our emphasis is on the importance of applying the knowledges.	lenges of the marine cology and population species in this and behavioural eccurates, ecology of goes that guide the dail is on the fate of many of conservation and	e environment. In dynamics of taxonomically ology; here we roup living and y lives of these rine mammals, d management	

	and behavioural ecology in ensuring long-term effective conservation of marine mammal populations. This course is designed for 3rd and 4th year students; it includes field trips, discussions of current scientific research, innovative research techniques and recent discoveries. Students will undertake independent literature-searches and will discuss their projects during classroom debates, training their skills in conceptual and analytical approaches to science.					
Course Learning Outcomes	· ·	al and analytical approaches to science.  ssful completion of this course, students should be able to:				
Source Ecuring Sucomes	1. Appred 2. Undersecosystem 3. Underseand marin 4. Appred 5. Think	1. Appreciate marine mammal diversity and biogeography. 2. Understand how mammals adapt and function in an aquatic environment and their role in the ma ecosystem. 3. Understand and appreciate the complexity of interactions between environmental selective pressuland marine mammal behaviour, population structure and demography. 4. Appreciate the socio-ecological diversity and behavioural complexity of marine mammals. 5. Think analytically in terms of marine mammal ecology and anthropogenic impacts in the rap changing world.				
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in B	IOL2306 Ecology and evolution				
Offer in 2014 - 2015	N	Examination				
Offer in 2015 - 2016	Υ	LXammation				
Course Grade	A+ to F					
Grade Descriptors	A	Evidence of a thorough grasp of the subject in a broader comparative perspreading and excellent use of named examples and case studies. Evidence excellent use of a broad range of fundamental concepts to draw insightful art to learn, great abilities of independent work, effective presentation skills vexcellent or outstanding work relative to what is required at degree level.	ce of independen nd logical conclus with excellent ana	nt critical thought with ions. Show eagerness alytical argumentation.		
	В	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.				
	C Demonstrate an adequate, but not coherent and incomplete grasp of the subject, with limited background reading and limited use of named examples and case studies. Some abilities of logical critical thinking, but not insightful and/or independent; only partial abilities to use acquired knowledge and work independently to draw meaningful conclusions. Fair presentation skills, with mostly correct argumentation, but limited (or no) abilities to integrate broader concepts. Work sufficient for what is required for degree level.					
	Demonstrate some grasp of the subject, but partial and limited to the most basic concepts, examples, and limited (or none) case studies. Insufficient evidence of background reading, limited abilities of critical independent thinking, and not particularly effective presentation skills with generally weak logical argumentation and restricted ability of drawing appropriate conclusions. Work barely meets what is required at degree level.					
	Fail	No evidence of basic minimum knowledge and understanding of the subject and no familiarity with any relevant examples and case studies. Inadequate ineffective presentation skills with poor argumentation and no abilities to dra reach degree level.	e evidence of col	nerent logical thought;		
				ioracione. Work raile to		
Course Type	Lecture v	vith laboratory component course		oladiono. Violik idilo to		
Course Type Course Teaching		vith laboratory component course				
	Activitie	vith laboratory component course  Details		No. of Hours		
Course Teaching		including field trips, res	research			
Course Teaching	Activitie	Details  including field trips, res vists, demonstration of techniques, intera classroom debates	research	No. of Hours		
Course Teaching	Activitie Lectures Laborato	Details  including field trips, res vists, demonstration of techniques, intera classroom debates	research	No. of Hours 24 32		
Course Teaching	Activitie Lectures Laborato	Details  including field trips, res vists, demonstration of techniques, intera classroom debates  vork  / Self study	f research ictive	No. of Hours 24 32		
Course Teaching & Learning Activities  Assessment Methods	Activities Lectures Laborato Project v Reading	including field trips, resvists, demonstration of techniques, interaclassroom debates  york  / Self study  Details  including field trips, resvists, demonstration of techniques, interaclassroom debates  project work review  Details  including activity	r research ctive	No. of Hours 24 32 8 60 Weighting in final		
Course Teaching & Learning Activities  Assessment Methods	Activities Lectures Laborato Project v Reading	including field trips, resvists, demonstration of techniques, interaclassroom debates  vork  / Self study  Details  including field trips, resvists, demonstration of techniques, interaclassroom debates  project work review  Details  including active participation/continuous assessment	r research ctive	No. of Hours 24 32 8 60 Weighting in final course grade (%)		
Course Teaching & Learning Activities  Assessment Methods	Activities Lectures Laborato Project v Reading Methods Assignm Examina Hoelzel A Reynolds Perrin Wi	including field trips, resvists, demonstration of techniques, interaclassroom debates  project work project work review    Self study	research ctive	No. of Hours  24  32  8 60  Weighting in final course grade (%)  55  45  2002) Press 1999) emic Press 2008)		
Course Teaching & Learning Activities  Assessment Methods and Weighting  Required/recommended reading	Activities Lectures Laborato Project v Reading  Methods  Assignm  Examina Hoelzel A Reynolds Perrin WI Mann J, Press 200	including field trips, resvists, demonstration of techniques, interaclassroom debates  project work project work review    Self study	research ctive	No. of Hours  24  32  8 60  Weighting in final course grade (%)  55  45  2002) Press 1999) emic Press 2008)		

BIOL3401 Molecular bio	ology (6 credits)		Academic Year	2014
Offering Department	Biological Sciences		Quota	130
Course Co-ordinator	Prof B K C Chow, Biological Sciences (bkcc@hku.hk)	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 gene structure and function at the molecular level.			
Course Contents & Topics	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 emphasis on the regulation of prokaryotic and eukaryotic gene expression. Recently developed biochemical techniques including oligonucleotide synthesis, DNA sequencing, complementary screening and DNA cloning, site-directed mutagenesis, polymerase chain reaction and transgenic technology will also be discussed.				
Course Learning Outcomes	On succes	sful completion of this course, stu	dents should be able to:		
	eukaryotic 2. Underst translation 3. Explain 4. Demon	he basic structures of DNA, RN cells.  and the biochemical processes in all modifications in prokaryotes an and describe the regulation of ger strate knowledge and understar techniques including PCR, site-di	nvolved in DNA replication deukaryotes. the transcription in prokaryonding of the underlying	n, transcription, to tes and eukaryot concepts associ	ranslation and post
Pre-requisites (and Co-requisites and Impermissible combination)		BIOL2103 Biological sciences lab Basic biochemistry	oratory course or BIOL2	2220 Principles	of biochemistry or
Offer in 2014 - 2015	Y 1st s	sem		Examination	Dec
Offer in 2015 - 2016	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 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.				
	С	Demonstrate general but incomplete command of knowledge required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective lab skills and techniques. Mostly correct but some erroneous use of data and results to draw appropriate conclusions. Apply moderately effective organizational and presentational skills.			
	D	Demonstrate partial but limited command of knowledge required for attaining some of the course learning outcome. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limite ability to apply knowledge to solve problems. Apply partially effective lab skills and techniques. Limited ability to us data and results to draw appropriate conclusions. Apply limited or barely effective organizational and presentations skills.			
	Fail	Demonstrate little or no evidence of contact of analytical and critical abilities, let o solve problems. Apply minimally effiand/or unable to draw appropriate contentions.	ogical and coherent thinking. She ective or ineffective lab skills a	ow very little or no ab nd techniques. Misu	se of data and results
Course Type	Lecture wit	th laboratory component course			
Course Teaching	Activities		Details		No. of Hours
& Learning Activities	Lectures				24
	Laborator	у			20
	Tutorials				6
	Reading /	Self study			100
Assessment Methods and Weighting	Methods		Details		Weighting in final course grade (%)
	Assignme	ents	assessment of prac	tical work	20
	Examinati	ion			80
Required/recommended reading and online materials	J. Watson B. Lewin: 0	: Molecular Biology (McGraw-Hill et al.: Molecular Biology of the Ge Gene IX (Jones and Bertlett, 2008 burnal articles and web learning m	ne (Benjamin Cummings,	2004)	
	100				

BIOL3402 Cell biology and cell technology (6 credits)		Academic Year	2014
Offering Department	ffering Department Biological Sciences		120
Course Co-ordinator	Prof A S T Wong, Biological Sciences (awong1 @hku.hk)		
Teachers Involved	Prof A S T Wong, Biological Sciences Prof M L Chye, Biological Sciences Dr W Y Lui, Biological Sciences		

Course Objectives		To provide a coherent understanding of the structure and function of cells, and the principles and applications of cell culture and instrumentation in biology and biotechnology				
Course Contents & Topics	Cell mem transport.	I. Cell Biology Cell membranes. Organelles. Cellular transport: ions transport and ions channels. Protein and RNA transport. Membrane potentials, Action potentials. Cell junctions. Extracellular Matrix. Cell-cell interactions. Cell-matrix interactions.				
	Mammalia Media for Mechanis III. Techni	mulation, growth factors and desim of cryopreservation.	continuous cell lines. Cell types and gn of serum-free media. Culture lab	facilities and sterilization.		
		Root and shoot cultures. Explant regeneration. Protoplasts. Secondary metabolites.				
Course Learning Outcomes	1. Acquire 2. Demon	On successful completion of this course, students should be able to:  1. Acquire fundamental knowledge on cell biology and cell technology.  2. Demonstrate basic laboratory techniques on cell culture.  3. Gain insight into real-life applications in cell biology and cell technology.				
Pre-requisites (and Co-requisites and Impermissible combination)	BIOC2600	Pass in BIOL2103 Biological sciences laboratory course or BIOL2220 Principles of biochemistry or BIOC2600 Basic biochemistry				
Offer in 2014 - 2015	Y 1st	sem	Examina	tion Dec		
Offer in 2015 - 2016	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 range of relevant concepts.					
	В	B Demonstrate substantial command of a broad range of knowledge required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational skills. Writings mostly demonstrate informed, thoughtful intellectual engagement with broad range of relevant concepts.				
	С	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. Writings mostly indicate informe intellectual engagement with concepts or theories but not always with sufficient depth, breadth or understanding.				
	D Demonstrate partial but limited command of knowledge required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational skills. Writings indicate some intellectual engagement with concepts or theories but mostly at a superficial level.					
	Fail	Lack of analytical and critical abilities, I to solve problems. Organizational sk	ommand of knowledge required for attaining ogical and coherent thinking. Show very little ills are minimally effective or ineffective. Vor theories. Writings are irrelevant or superfici	or no ability to apply knowledge Vritings reveal an absence of		
Course Type	Lecture w	ith laboratory component course				
Course Teaching	Activitie	S	Details	No. of Hours		
& Learning Activities	Lectures			24		
	Laborato	ry		24		
	Tutorials			12		
	Reading	/ Self study		100		
Assessment Methods and Weighting	Methods	<b>.</b>	Details	Weighting in final course grade (%)		
	Assignments		assessment of practical work	30		
	Examina	tion		70		
Required/recommended reading and online materials	Alberts, B Mather, J.	Textbooks: Alberts, B. et al.: Molecular Biology of the Cell (Garland, 2008, 5th ed.) Mather, J. P.: Introduction to Cell and Tissue Culture, Theory and Techniques (Plenum, 1998) Collins, H.A. & Edwards, G.S.: Plant Cell Culture (Oxford: Bios Scientific, 1998)				
	Reference TBC	es:				
Course Website	http://moo	odle.hku.hk/				

BIOL3403 Immunology	(6 credits)	Academic Year	2014
Offering Department	Biological Sciences	Quota	100
Course Co-ordinator	Dr B L Lim, Biological Sciences (bllim@hku.hk)		
Teachers Involved	Dr B L Lim, Biological Sciences Prof W W M Lee, Biological Sciences		
Course Objectives	To provide a broad understanding of the animal immune system	m. Topics will also include	the application of

	a variety of	a variety of immunological methods to research and disease diagnosis.				
Course Contents & Topics	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.				genes. Emergence ex. Complement persensitivity, and	
Course Learning Outcomes	Describe mechanism     Describe     Explain vaccination     Explain I	On successful completion of this course, students should be able to:  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.  2. Describe the organization of the mammalian immune system in terms of genes, cells and tissues.  3. Explain the underlying mechanisms associated with transplant rejection, transfusion reaction and vaccination.  4. Explain how the immune system responds to infections by bacteria, viruses and parasites.  5. Understand antigen-antibody interaction and the principle of immunoassays.				
Pre-requisites (and Co-requisites and Impermissible combination)		ass in BIOC2600 Basic biochemistry or BIOL2220 Principles of biochemistry or BIOL2103 Biological iences laboratory course				
Offer in 2014 - 2015	Y 2nd	2nd sem Examination May				
Offer in 2015 - 2016	Υ	(				
Course Grade	A+ to F	A+ to F				
Grade Descriptors	A 1. Exceptionally good performance demonstrating comprehensive understanding of the subject matter. 2. Critical insight and analysis into the scientific literatures. 3. Superior writing, presentation and group communication skills.					
	B 1. Good performance demonstrating full understanding of the subject matter. 2. Coherent insight and analysis into the scientific literatures. 3. Good writing, presentation and group communication skills.					
	С	1. Satisfactory performance demonstrating adequate understanding of the subject matter. 2. Some insight into the scientific literatures. 3. Adequate writing and communication skills.				
	D	scientific literatures. 3.Limited writing and communication skills.				
	Fail	Fail 1. Poor understanding of subject matter. 2. Little to no insight into use of the scientific literatures. 3. Unable to writ or communicate.				
Course Type	Lecture wit	h laboratory component course				
Course Teaching & Learning Activities	Activities		Details		No. of Hours	
& Learning Activities	Lectures				30	
	Laboratory	у	during reading wee	ek	16	
	Tutorials				6	
	Reading /	Reading / Self study 1				
Assessment Methods and Weighting	Methods		Details		Weighting in final course grade (%)	
	Examinati	on			80	
	Laboratory	Laboratory reports 20				
Required/recommended reading and online materials	Benjamin 8	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 edition) I. Roitt, J. Brostoff and D. Male: Immunology (Mosby, latest 2 editions)				
Course Website	http://mood	dle.hku.hk/				
Additional Course Information	This course	e will be offered subject to a minim	num enrollment number a	and availability of te	eachers.	

<b>BIOL3405 Molecular micro</b>	obiology (6 credits)	Academic Year	2014		
Offering Department	Biological Sciences	Quota	30		
Course Co-ordinator	Dr J S H Tsang, Biological Sciences (jshtsang@hku.hk)				
Teachers Involved	Dr J S H Tsang, Biological Sciences				
Course Objectives	This course is intended for biology, biotechnology and biochemistry the modern fundamentals of microbiology. At the end of the course physiological, biochemical and molecular aspects of microbiology.				
Course Contents & Topics	The basic biochemistry of microorganisms will be described. The in microbes in the environment will be examined. The adaptation of means of physiological changes and genetical alterations will be bacteria and viruses will be considered. The molecular biology of platheir association with medical aspect will be discussed. The us microorganisms will be explored.	the microbes to the illustrated. The molesmids and transpose	e environment by lecular biology of able elements and		
Course Learning Outcomes	On successful completion of this course, students should be able to:  1. Understand the intrinsic reorganization of microbes in response to 2. Comprehend the major modes of regulation in the microbe. 3. Explain the biology of bacteriophages and plasmids. 4. Realize the importance of transposable elements in the survival of	the changing enviro	nments.		
	220				

	5. Appreci	ate the development of modern techr	ilques in studying micr	oorganisms.		
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in Bl	Pass in BIOL2103 Biological sciences laboratory course				
Offer in 2014 - 2015	Y 2nd	Y 2nd sem Examination May				
Offer in 2015 - 2016	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. Demonstrate thorough grasp of the subject. Show strong analytical and critical abilities and logical thinking, with evidence of original thought. Apply highly effective lab skills and techniques. Critical use of data and results to draw appropriate and insightful conclusions. Apply highly effective organizational and presentational skills.				
	В	Demonstrate substantial command of a brithe course learning outcomes. Demonstrate abilities and logical thinking. Apply effect appropriate conclusions. Apply effective org	e substantial grasp of the su ive lab skills and techniqu	bject. Show evidence of dates. Correct use of dates.	f analytical and critical	
	С	Demonstrate general but incomplete commendation outcomes. Demonstrate general critical abilities and logical thinking. Apply erroneous use of data and results to draw presentational skills.	but incomplete grasp of th moderately effective lab sk	e subject. Evidence of ills and techniques. Mo	some analytical and estly correct but some	
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Demonstrate partial but limited grasp, with retention of some relevant information, of the subject. Evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Apply partially effective lab skills and techniques. Limited ability to use data and results to draw appropriate conclusions. Apply limited or barely effective organizational and presentational skills.				
	Fail	Fail  Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Demonstrate evidence of little or no grasp of the knowledge and understanding of the subject. Eviden of little or lack of analytical and critical abilities, logical and coherent thinking. Apply minimally effective or ineffectil 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	Lecture with laboratory component course				
Course Teaching	Activities					
& Learning Activities	Lectures					
	Laboratory				24	
	Tutorials				6	
	Reading / Self study				100	
	Methods Details Weighting in fin					
Assessment Methods and Weighting	Methods		Details		Weighting in final course grade (%)	
	Methods Examinat		Details			
		ion	Details		course grade (%)	
	Examinat	ion ry reports	Details		course grade (%)	
	Examinat Laborator Presentat  TBC Maloy S.R Willey, Sh Watson, B	ion ry reports	al Genetics (Jones & Eciples of Microbiology of the	Bartlett 1994, 2nd e (McGraw Hill 2009 Gene (CSHL Pres	course grade (%) 70 20 10 ed.) s 2008, 6th ed.)	
and Weighting  Required/recommended reading	Examinat Laborator Presentat TBC Maloy S.R Willey, Sh Watson, B Madigan, I	ion ry reports tion, Cronan J.E. & Freifelder D. Microbi erwood & Woolverton: Prescott's Print taker, Bell, Gann, Levine & Losick: Me	al Genetics (Jones & Eciples of Microbiology of the	Bartlett 1994, 2nd e (McGraw Hill 2009 Gene (CSHL Pres	course grade (%) 70 20 10 ed.) s 2008, 6th ed.)	

<b>BIOL3406 Reproduction a</b>	nd reproductive biotechnology (6 credits)	Academic Year	2014
Offering Department	Biological Sciences	Quota	30
Course Co-ordinator	Prof A O L Wong, Biological Sciences (olwong@hku.hk)	'	<u>'</u>
Teachers Involved	Prof A O L Wong, Biological Sciences		
Course Objectives	To provide a comprehensive overview on modern concepts and reproductive biotechnology in human and animal models.	I recent advance in repro	oductive biology &
Course Contents & Topics	<ul> <li>Basic concepts of reproduction, evolution of sex, human &amp; a behavior.</li> <li>Molecular mechanisms for sex determination, developmental a systems.</li> <li>Neuroendocrinology of reproductive system and recent advasteroid feedback.</li> <li>Environmental endocrine disruptors and recent advances in breproduction in human.</li> <li>Embryonic stem cells &amp; induced pluripotent stem cells medicine/therapeutic cloning.</li> <li>Germ line engineering &amp; gene therapy, animal cloning and primodels.</li> </ul>	spects of gametogenesis ances in kisspeptin & G iotechnology for fertility and their applications	s and reproductive inRH system and control & assisted in regenerative
Course Learning Outcomes	On successful completion of this course, students should be abl	e to:	
	Have a broad understanding of reproductive biology ranging f		

Lectures Laboratory Tutorials Reading / Self study  Methods Details Weighting  Methods Examination Laboratory reports Test Test Test & Continuous Assessment  Required/recommended reading and online materials  Test & Continuous Assessment  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. Elsevier/Saunders (2014) 3. 'Stem Cells in Reproductive Medicine: Basic Science & Therapeutic Potential' by C. Simon 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, Caluniversity Press (2012) 6. 'Assisted Reproduction Techniques: Challenges & Management Option' by K. Shariit	reproductive al cloning & ripotent stem
Offer in 2014 - 2015 Offer in 2015 - 2016  A to F  Course Grade A+ to F  A bemonstrate thorough mastery at an advanced level of extensive locoundage required for attaining all the searning outcomes. Show softeng analytical and critical sabilities and register in a valid sality of paphy knowledge to a valid range of complex, familiar and unramiliar situations. Apply highly ab skills and techniques. Circiacl use of data and results to draw appropriate and insightful conclusions. Apply effective or granucational and presentational skills.  B bemonstrate substantial command of a broad range of knowledge required for attaining and learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability knowledge to familiar and some unfamiliar shatustors. Apply effective lab skills and techniques. Correct use consideration of the course of a consideration of the course of the course of a consideration of the course of the course of a consideration of the course of the course of a consideration of the course of the cours	chemistry or
Offer in 2015 - 2016  Course Grade  A+ to F  A   Demonstrate throrough mastery at an advanced level of extensive knowledge required for attaining all tearning outcomes. Show storing analytical and critical abilities and logical thinking, with evidence of origin and shilly to apply knowledge to a wider range of complex, familiar and unfamiliar shills and scholars. Apply has balkils and benchiques. Circlar use of data and recutes to draw appropriate and insighted conclusions. Apply insights and abilities and logical thinking, and ability of the earning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability or results to draw appropriate conclusions. Apply embedding and shills are results to draw appropriate conclusions. Apply embedding and shills are results to draw appropriate conclusions. Apply embedding abilities and logical thinking, and ability to apply to most familiar situations. Apply embedding abilities and special processors and results to draw appropriate conclusions. Apply moderately effective bis skills and techniques. Micely to apply to most familiar situations. Apply moderately effective bis skills and techniques. Micely to apply to most familiar situations. Apply moderately effective organization and results to draw appropriate conclusions. Apply moderately effective organization presentational skills.  D Demonstrate partial but limited command of knowledge required for attaining some of the course learning. Show widence of some orbitens, apply partially effective bis skills and critical abilities. Show apply infleted or barely effective organization and results to draw appropriate conclusions. Apply infleted or barely effective organization and results to draw appropriate conclusions. Organization and presentational skills are minimally effective draw appropriate conclusions. Organization and presentational skills are minimally effective infective.  Course Type  Lecture with laboratory component course  Lectures  Lectures  Lectures  Activities  Methods  Det	
A   Demonstrate thorough mastery at an advanced level of extensive knowledge required for attaining all tearming outcomes. Show witcong analytical and critical abilities and logical thinking, with evidence of original and ability to a wide range of complex, familiar antimatinal situations. Apply howledge to a wide range of complex, familiar and ability to a wide range of complex, familiar and ability to a wide range of complex, familiar and ability to a wide range of complex, familiar and ability of the course of	
learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original and ability to a wide range of complex, familiar infamiliar situations. Apply highlights skills and techniques. Critical use of data and results to draw appropriate and insightul conclusions. Apply included per entered to a significant of the composition of t	
learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability knowledge to familiar and some unfamiliar situations. Apply effective bal skills and techniques. Correct use results to draw appropriate conclusions. Apply effective organizational presentational skills.    C	original thought, highly effective
outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply to most familiar situations. Apply moderately effective lais and techniques. Mostly correct but some use of data and results to draw appropriate conclusions. Apply moderately effective to some use of data and results to draw appropriate conclusions. Apply moderately effective organization presentational skills.  D Demonstrate partial but limited command of knowledge required for attaining some of the course learning ability to apply knowledge to solve problems. Apply partially effective lab skills and techniques. Limited ab data and results to fraw appropriate conclusions. Apply limited or harely effective organizational and presskills.  Fail Demonstrate little or no evidence of command of knowledge required for attaining the course learning tack 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 organizational and results to favore analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to draw appropriate conclusions. Organization and presentational skills are minimally effective to reflective to solve problems. Apply minimally effective or ineffective organizational abilities, and organization and presentational skills are minimally effective.  Course Type  Lecture With laboratory component course  Course Teaching & Learning Activities  Activities  Details  No. organization and presentational skills are minimally effective organization. And presentational skills are minimally effective organization and presentational skills are minimally effective organization. And presentational skills are minimally effective organization and presentational skills are minimally effective organization. And presentational skills are minimally effective organization and presentational skills are minimally effective laboration and prese	ability to apply
Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities, shillipt to apply knowledge to solve problems. Apply partially effective tab skills and techniques. Limited abidata and results to draw appropriate conclusions. Apply limited or barely effective organizational and presidis.    Fail	pply knowledge some erroneous
Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply it to solve problems. Apply minimally effective or ineffective lab skills and techniques. Missues of data an and/or unable to draw appropriate conclusions. Organization and presentational skills are minimally effective.  Course Type  Lecture with laboratory component course  Activities  Details  No. of the course of the	s. Show limited ed ability to use
Course Teaching & Lectures  Lectures  Laboratory Tutorials Reading / Self study  Methods Details  Weighting  Examination Laboratory reports Test  Required/recommended reading and online materials  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. Elsevier/Saunders (2014) 3. 'Stem Cells in Reproductive Medicine: Basic Science & Therapeutic Potential' by C. Simo 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, Ca University Press (2012) 6. 'Assisted Reproduction Techniques: Challenges & Management Option' by K. Shariit	pply knowledge ata and results
Lectures Laboratory Tutorials Reading / Self study  Methods Details Weighting  Examination Laboratory reports Test Test Test Continuous Assessment  Required/recommended reading and online materials  Required/recommended:  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. Elsevier/Saunders (2014)  3. 'Stem Cells in Reproductive Medicine: Basic Science & Therapeutic Potential' by C. Simon 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, Cally	
Lectures Laboratory Tutorials Reading / Self study   Methods  Methods  Details  Weighting  Examination Laboratory reports Test  Test  Test & Continuous Assessment  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. Elsevier/Saunders (2014) 3. 'Stem Cells in Reproductive Medicine: Basic Science & Therapeutic Potential' by C. Simo 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, CalUniversity Press (2012) 6. 'Assisted Reproduction Techniques: Challenges & Management Option' by K. Shariit	No. of Hours
Assessment Methods and Weighting  Methods  Details  Weighting course greatly and Weighting  Examination  Laboratory reports  Test  Test Continuous Assessment  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. Elsevier/Saunders (2014) 3. 'Stem Cells in Reproductive Medicine: Basic Science & Therapeutic Potential' by C. Simo 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, Caluniversity Press (2012) 6. 'Assisted Reproduction Techniques: Challenges & Management Option' by K. Sharii	24
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Assessment Methods and Weighting    Examination	6
and Weighting  Examination  Laboratory reports  Test  Test  Test & Continuous Assessment  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. Elsevier/Saunders (2014) 3. 'Stem Cells in Reproductive Medicine: Basic Science & Therapeutic Potential' by C. Simology 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, Caluniversity Press (2012) 6. 'Assisted Reproduction Techniques: Challenges & Management Option' by K. Sharii	100
Laboratory reports  Test  Test  Test & Continuous Assessment  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. Elsevier/Saunders (2014) 3. 'Stem Cells in Reproductive Medicine: Basic Science & Therapeutic Potential' by C. Simo 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, Ca University Press (2012) 6. 'Assisted Reproduction Techniques: Challenges & Management Option' by K. Sharii	
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Required/recommended reading and online materials  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. Elsevier/Saunders (2014) 3. 'Stem Cells in Reproductive Medicine: Basic Science & Therapeutic Potential' by C. Simo 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, Ca University Press (2012) 6. 'Assisted Reproduction Techniques: Challenges & Management Option' by K. Sharii	
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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, Ne Springer (2010).	<b>se grade (%)</b> 70
Course Website http://moodle.hku.hk/	se grade (%) 70 20 10 R. Barbieri, Simon et al, c, Cambridge Sharif & A.
Additional Course Information  Refer to the Website of School of Biological Sciences  This course will be offered subject to a minimum enrollment number and availability of teachers.	se grade (%) 70 20 10 R. Barbieri, Simon et al, c, Cambridge Sharif & A.

BIOL3408 Genetics (6 cre	dits)	Academic Year	2014
Offering Department	Biological Sciences	Quota	50
Course Co-ordinator	Dr C S C Lo, Biological Sciences (clivelo@hku.hk)		
Teachers Involved	Dr C S C Lo, Biological Science Dr J Zhang, Biological Sciences		

Course Objectives	This cours	This course aims to provide students with fundamental knowledge of classical, molecular and popula genetics			lar and population	
Course Contents & Topics	analysis a and recompopulation	Topics will include cellular reproduction, principles and chromosomal basis of Mendelian genetics, linkage analysis and mapping, concept and definition of the gene, molecular mechanisms of mutation, DNA repair and recombination, DNA transposition, extranuclear inheritance, developmental genetics, quantitative and population genetics. Students are strongly encouraged to take BIOL2303 Molecular Biology to get a more comprehensive coverage of topics in molecular genetics.				
Course Learning Outcomes	1. Appreci 2. Use diff 3. Apply	On successful completion of this course, students should be able to:  . Appreciate the beauty of genetic organizations in nature.  . Use different genetic principles to explain hereditary traits observed in nature and laboratories.  . Apply qualitative and quantitative experimental methodologies for genetic analysis at individual opulation levels.				
Pre-requisites (and Co-requisites and Impermissible combination)		OL2103 Biological sciences laboratory	course			
Offer in 2014 - 2015	Y 1st	sem	Ex	amination	Dec	
Offer in 2015 - 2016	Υ					
Course Grade	A+ to F					
Grade Descriptors	A	course learning outcomes. Show strong anal thought, and ability to apply knowledge to a w	emonstrate thorough mastery at an advanced level of extensive knowledge and skills required for a urse learning outcomes. Show strong analytical and critical abilities and logical thinking, with evide ought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Into I range of appropriate theories, principles, evidence and techniques			
	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. General integration of 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. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Some partial integration of theories, principles, evidence and techniques				
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Limited integration of theories, principles, evidence and techniques				
	Fail	Demonstrate little or no evidence of comma outcomes. Lack of analytical and critical abilit knowledge to solve problems. Little or no or in	ties, logical and coherent thinkin	g. Show very little	or no ability to apply	
Course Type	Lecture wi	th laboratory component course				
Course Teaching	Activities	3	Details		No. of Hours	
& Learning Activities	Lectures				24	
	Laborator	у			24	
	Tutorials		tutorials & laboratories		6	
	Reading / Self study			100		
Assessment Methods and Weighting	Methods		Details		Weighting in final course grade (%)	
	Assignme	ents	laboratory reports, assi	gnments	30	
	Examinat	xamination		70		
Course Website	http://moo	dle.hku.hk/	·	·		
Additional Course Information	This cours	e will be offered subject to a minimum e	enrollment number and ava	ailability of tead	chers.	

BIOL3409 Business aspec	ets of biotechnology (6 credits)	Academic Year	2014
Offering Department	Biological Sciences	Quota	40
Course Co-ordinator	Dr W B L Lim, Biological Sciences (bllim@hku.hk)		
Teachers Involved	Dr W B L Lim, Biological Science Dr G Panagiotou, Biological Science		
Course Objectives	The course will give an overview of the innovative developments students with useful tools in learning how an exciting research idea model.		
Course Contents & Topics	The course will first introduce the history and current development of companies in healthcare biotechnology, protein pharmaceutical enzymes, transgenic animals and crops, will be taken as examples principles. Topics on 4P of biotechnology industry, intellectual prop process, licensing, start-up and fundraising will be covered. Researc up, clinical trials, field tests, regulatory agencies, good laborator practice will be illustrated. Throughout the course, guest entreprer biotech industry will be presenting case studies and explain their pharmaceutical companies.	s, vaccines, diagn to illustrate the unde erties, patent laws, th and development by practice and goo neurs, managers an	ostics, industrial erlining technology patent application of products, scale- ad manufacturing d directors of the
Course Learning Outcomes	On successful completion of this course, students should be able to:		
	200		

	businesses 2. Understa 3. Navigate up, to mark 4. Gain tec	and and demonstrate how discoverie the various steps in the developme	s and inventions are commercialized ont of a biotechnology derived produce biotechnology and bioprocessing in	t: from bench, to scale-		
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in any	y level 2 BIOL or BIOC course				
Offer in 2014 - 2015	Y 2nd	sem	Examination	No Exam		
Offer in 2015 - 2016	Υ					
Course Grade	A+ to F					
Grade Descriptors	Α	A Students acquire exceptional skills and knowledge from the course and are capable of independently analyzing business and technological developments of various biotechnology ventures.				
	В		th understanding of the current development and technological developments of various bi			
	С	Students demonstrate a broad and in-depth understanding of the current developments in biotechnology industry.				
	D Students demonstrate a moderate understanding of the current developments in biotechnology industry.					
	Fail	Students fail to demonstrate a moderate un	derstanding of the current developments in bi	otechnology industry.		
Course Type	Lecture-ba	Lecture-based course				
Course Teaching	Activities	Activities Details No. of				
& Learning Activities	Lectures			36		
	Group wo	rk	group work/project/visit	12		
	Reading /	Self study		100		
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)		
	Assignme	nts	Patent (10%), Licensing agreement (10%), Fermentation economics (5%), Vaccine development (15%), Business plan (30%), Participation (10%)	80		
	Presentati	on		20		
Required/recommended reading and online materials	TBC					
Course Website	http://mood	lle.hku.hk/				
Additional Course Information	This course	e will be offered subject to a minimur	n enrollment number and availability	of teachers.		

BIOL3501 Evolution (6 cr	edits)	Academic Year	2014
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	Evolution is the cornerstone of modern biology. The course of contemporary evolutionary biology, including the history of adaptation, speciation, and evolution as an explanatory fram The course emphasizes the interplay between theory and students with the process of science.	of evolutionary biology, evolu- nework at all levels of biologic	tionary processe cal organization.
Course Contents & Topics	Introduction to Evolution  - The relevance of evolution to everyday life  - Cases for evolutionary thinking  Evolution as Fact  - Patterns of evolutionary change  - The evidence for evolution  Evolution as Theory  - Before Darwin  - Darwinism  - The Modern Synthesis & beyond  The Mechanisms of Evolution  - The origin of genetic variation: mutation  - Genetic drift: evolution at random.  - Natural selection, sexual selection, and adaptation.  - Migration  Evolution and Biodiversity  - Species  - Speciation  - Evolution and development		

	- The histo	ry of life g Evolutionary Trees				
Course Learning Outcomes	On successful completion of this course, students should be able to:					
	2. Describe lead to spe 3. Have ar 4. Apply	<ol> <li>Familiar with the facts and theory of evolution.</li> <li>Describe Darwin's theory of evolution by natural selection and how the process of natural selection can lead to speciation.</li> <li>Have an advanced understanding of the modern evolutionary theory.</li> <li>Apply evolutionary thinking to real world problems in agriculture, medicine, and biodiversity conservation.</li> </ol>				
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in Bl	DL2306 Ecology and evolution				
Offer in 2014 - 2015	Y 1st	1st sem Examination Dec				
Offer in 2015 - 2016	Υ		!			
Course Grade	A+ to F					
Grade Descriptors	A	over a wide range of topics covered by the	ting excellent understanding of the subject ma course, and skillful applications of concepts/ es in critical thinking and logical reasoning, w he critical issues in the field.	theories in solving new or		
	В	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.				
	С	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.				
	D	D Minimally acceptable performance demonstrating at least partial familiarity with the subject matter and some capacity to deal with relatively simple problems, but also demonstrating serious deficiencies in knowledge required for attaining most of the expected course learning outcomes.				
	Fail	Fail  Poor performance in all aspects of the course, showing little evidence of learning, lacking real understanding of the subject matter, demonstrating deficiencies serious enough to make it inadvisable to proceed further without additional course work.				
Course Type	Lecture-ba	sed course				
Course Teaching	Activities		Details	No. of Hours		
Course Teaching & Learning Activities				NO. OI HOUIS		
& Learning Activities	Lectures			No. 01 Hours		
	Lectures	ork		36		
	Lectures Tutorials Project w	ork Self study		36 12		
	Lectures Tutorials Project w		Details	36 12 12		
& Learning Activities  Assessment Methods	Lectures Tutorials Project we Reading /	Self study	Details	36 12 12 100 Weighting in final		
& Learning Activities  Assessment Methods	Lectures Tutorials Project we Reading /	Self study	Details	36 12 12 100 Weighting in final course grade (%)		
& Learning Activities  Assessment Methods	Lectures Tutorials Project we Reading / Methods Assignme	Self study  nts on	Details  including class participation (10%)	36 12 12 100 Weighting in final course grade (%) 10 50		
& Learning Activities  Assessment Methods	Lectures Tutorials Project we Reading /  Methods  Assignment	Self study  nts on	including class participation	36 12 12 100 Weighting in final course grade (%) 10 50		
& Learning Activities  Assessment Methods	Lectures Tutorials Project we Reading /  Methods Assignme Examinat Presentat Test J.C. Herro	Self study  nts on	including class participation (10%)  /sis (5th ed. Pearson, 2013)	36 12 12 100 Weighting in final course grade (%) 10 50		
& Learning Activities  Assessment Methods and Weighting  Required/recommended reading	Lectures Tutorials Project we Reading /  Methods Assignme Examinat Presentat Test J.C. Herro	Self study  nts on on and S. Freeman: Evolutionary Analy Futuyma: Evolution, (3rd Edition, Sin	including class participation (10%)  /sis (5th ed. Pearson, 2013)	36 12 12 100 Weighting in final course grade (%) 10 50		
& Learning Activities  Assessment Methods and Weighting  Required/recommended reading	Lectures Tutorials Project we Reading /  Methods  Assignment Examinat Presentat Test  J.C. Herro Douglas J. eBooks ave http://mood	Self study  nts on on and S. Freeman: Evolutionary Analy Futuyma: Evolution, (3rd Edition, Sin	including class participation (10%)  vsis (5th ed. Pearson, 2013) auer Associates, 2013)	36 12 12 100 Weighting in final course grade (%) 10 50 25		

<b>BIOL3502 Conservation ge</b>	netics (6 credits)	Academic Year	2014		
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 fundamental principles and recent advances in conservation genetics. The theories and methods will be taught with a balanced range of examples - mammals, birds, reptiles, amphibians, fish, invertebrates, as well as plants - to demonstrate how genetic data can be used to answer a range of important questions in real world conservation practice.				
Course Contents & Topics	Introduction to conservation genetics.  Part I. Evolutionary Genetics of Natural Populations: - genetic diversity - characterizing genetic diversity: single loci and quantitative variat - evolutionary impacts of natural selection, mutation, migration and - genetic consequences of small population sizes; - maintenance of genetic diversity; - population genomics.		ge populations;		
	- maintenance of genetic diversity;				

Course Learning Outcomes	- loss of ge - inbreeding - inbreeding - population - geneticall Part III. Fro - resolving - genetic m - genetic m - genetic m - use of mo On success 1. Demons 2. Understa species. 3. Know the 4. Compre evolutionar 5. Describe implications 6. Gain ab species bic	g depression; n fragmentation; y viable populations.  Im Theory to Practice: taxonomic uncertainties and defining ranagement of wild populations; sues in introduced and invasive species anagement of captive populations; anagement for reintroduction; elecular genetics in forensics and under stul completion of this course, students trate an advanced understanding of the and the criteria for determining the content of the relationships between gety potential in wild populations the effects of habitat fragmentation as in managing nature reserves. Sility to integrate genetic information plogy, in setting conservation priorities	erstanding species biol is should be able to: e concepts of conserviservation status of en iversity at population a enetic diversity, inbreand population size re in resolving taxonom	ration genetics. dangered, vulnera and species levels seding, reproduct duction on genetic nic uncertainties,	ive fitness, and diversity and the in understanding
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in BIC	DL2306 Ecology and evolution or BIOL	.3303 Conservation ed	cology or BIOL340	8 Genetics
Offer in 2014 - 2015	N			Examination	
Offer in 2015 - 2016	Υ			1	
Course Grade	A+ to F				
Grade Descriptors	A Exceptionally good performance demonstrating excellent understanding of the subject matter, extensive knowledge over a wide range of topics covered by the course, and skillful applications of concepts/theories in solving new or unfamiliar problems, showing strong abilities in critical thinking and logical reasoning, with evidence of significant insight and original thought in dealing with the critical issues in the field.				
	<b>B</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.				
	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.				
	D	Minimally acceptable performance demonst capacity to deal with relatively simple problet for attaining most of the expected course lear	ms, but also demonstrating ning outcomes.	serious deficiencies in	knowledge required
	Fail  Poor performance in all aspects of the course, showing little evidence of learning, lacking real understanding of the subject matter, demonstrating deficiencies serious enough to make it inadvisable to proceed further without additional course work.				
Course Type	Lecture wit	h laboratory component course			
Course Teaching	Activities		Details		No. of Hours
& Learning Activities	Lectures				24
	Laboratory	1			12
	Project wo	rk			12
	Tutorials				12
	Reading /	Self study			100
Assessment Methods and Weighting	Methods		Details		Veighting in final course grade (%)
	Assignme	nts			10
	Examination	on			50
	Presentati	on	including classroom (10%)	participation	25
	Test		(,		15
Required/recommended reading and online materials	Frankham e-book ava	et al: Introduction to Conservation Ger ilable	netics (Cambridge Uni	versity Press, 2009	9, 2nd ed.)
Course Website	http://mood	le.hku.hk/			
Additional Course Information	Website - to This course	o be listed will be offered subject to a minimum	enrollment number an	d availability of tea	achers.

Offering Department	Biologica	Sciences	Quota	120		
Course Co-ordinator	Prof B K	Chow, Biological Sciences (bkcc@hku.hk)		'		
Teachers Involved	Dr L T O	C Chow, Biological Sciences .ee, Biological Sciences Wong, Biological Sciences				
Course Objectives		e an advanced course on hormones and how homeostasis in our body.	w they regulate metabolism/gro	wth, reproduction and		
Course Contents & Topics	cell signa The hypo The GHR stress. Ca The gastr The ente Regulatio gastrin, C intake. Insulin an Reproduc The GnR Interactio actions of The men endocrine broodines Osmoreg Posterior	History: discovery of blood borne factor or hormone. Chemical nature of hormones. Mechanisms of cell-cell signaling. Secondary messengers. Responsivity and hormonal effects.  The hypothalamic pituitary axis  The GHRH-GH-IGF axis. The TRH-TSH-thyroid hormone axis. The CRH-ACTH-cortisol axis. Cortisol and stress. Catecholamine effects and their pathways.  The gastrointestinal system  The enteric nervous system. The cephalic phase, stomach phase and intestinal phase of food digestion. Regulation of acid secretion. Regulation of pancreatic exocrine and endocrine secretion. Gut hormones: gastrin, GIP, CCK, secretin, GLP-1, GLP-2 and motilin. Regulation of feeding, energy balance and food intake.  Insulin and glucagon.  Reproduction  The GnRH-gonadotropin-sex hormone axis. Regulation of LH and FSH release. Male reproductive system. Interaction of hormones produced by various cells in the testis to regulate spermatogenesis. Biological actions of testosterone. The erection reflex. Female reproductive system. Development of ovarian follicles. The menstrual cycle: hormonal control: Ovulation, fertilization and implantation. The placenta as an endocrine organ. Endocrine regulation of parturition. Hormonal control of milk secretion. Prolactin and broodiness.  Osmoregulation  Posterior pituitary hormone, ADH. Aldosterone and sodium balance. Angiotensin's effect on blood pressure. Atrial natriuretic peptide and its function in water and sodium balance.				
Course Learning Outcomes	1. Unders 2. Explair 3. Descri organs. 4. Explair	On successful completion of this course, students should be able to:  1. Understand the definition and natures of hormones. 2. Explain and describe secondary messenger pathways for hormones. 3. Describe the connection between pituitary the master gland with higher brain centers and peripheral				
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in B	OL2103 Biological sciences laboratory cour	rse			
Offer in 2014 - 2015	N		Examination	ı		
Offer in 2015 - 2016	Υ					
Course Grade	A+ to F					
Grade Descriptors	В	learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational skills.				
		learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational skills.				
		Demonstrate general but incomplete command of knowledge required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational skills.				
		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	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.				
	Lecture w	ith laboratory component course				
Course Type						
Course Teaching	Activitie	s De	tails	No. of Hours		
Course Teaching		S Def	etails			
Course Teaching	Activitie	ny a 5	5-hour laboratory session per sek for 5 weeks	24		
Course Teaching	Activitie	ny a 5	5-hour laboratory session per	2 <sup>4</sup>		
Course Teaching	Activitie Lectures Laborato Tutorials	ny a 5	5-hour laboratory session per	24 25		
Course Teaching & Learning Activities  Assessment Methods	Activitie Lectures Laborato Tutorials	ry a 5 wer	5-hour laboratory session per	24 25 6 100 Weighting in fina		
Course Teaching & Learning Activities  Assessment Methods	Activities Lectures Laborato Tutorials Reading Methods	y Self study  Def	5-hour laboratory session per eek for 5 weeks	No. of Hours 24 25 6 100 Weighting in fina course grade (%		
Course Type Course Teaching & Learning Activities  Assessment Methods and Weighting	Activities Lectures Laborato Tutorials Reading	/ Self study  Defents cor	5-hour laboratory session per lek for 5 weeks	24 25 100 Weighting in fina course grade (%		

reading and online materials	Silverthorn: Human Physiology, An Integrated Approach (Pearson, 2006, 4" edition).
Course Website	http://moodle.hku.hk/
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.

		erdisciplinary approach (6 o	,			
Offering Department	Biological S		0	Quota	30	
Course Co-ordinator		atesen, Biological Sciences (rajan	@hku.hk)			
Teachers Involved	Dr K Shih,	atesen, Biological Sciences Civil Engineering g, Orthopaedics				
Course Objectives	<ul> <li>the biolog</li> <li>modern e</li> <li>the anthro</li> <li>affected by</li> <li>of applie</li> <li>investigation</li> </ul>	This interdisciplinary course seeks to provide students with an understanding of: the biology of coral, shrimps, oyster and starfish larvae modern environmental study techniques such as genomics, proteomics, transcriptomic and metabolomics the anthropogenic and climate change threats to larval biodiversity, how seafood and marine industries are affected by them of applied biology such as aquaculture, biofouling, and biomimetics through team projects and nestigations how scientists are borrowing from larvae across many different fields of engineering and medical science				
Course Contents & Topics	organisms studies and ecology, m graduates biomimetic molecular l integration focus on m Pearl Rive biomimetic	his advanced course for undergraduate and graduates is exploring larval biology of commercially important rganisms such as corals, shrimps and oysters using interdisciplinary (science, engineering and biomaterial) tudies and techniques. This course is specifically designed to explore interdisciplinary aspects of marine cology, molecular biology, environmental engineering and biomaterial science that are relevant to science raduates to investigate recent developments and careers in areas such as aquaculture, biofouling, and iomimetics. After reading about basic larval biology topics, we will focus on the latest and most powerful nolecular biology techniques (e.g. genomics, proteomics, metatranscriptomics and metabolomics) and how attegration of these modern tools can inform us about larval structure-function relationships. The course will be useful for human society through aquaculture, biofouling, and iomimetics. Thus, this larval biology course is an interdisciplinary/multi-disciplinary endeavor incompassing the ecology, molecular biological and economic dimensions of the marine environment.				
Course Learning Outcomes	of aquatic forms (call - Students results obta	e students with key concepts that organisms (e.g. corals, oysters at ed 'larval biology'). should be able to critically evalua ained with interdisciplinary technicarize students with certain interdis	nd shrimps) reproduce ar te scientific applications a ques from larval and aqua	and discoveries that cantile life systems.	specialized larva	
		ecology, science, and engineerin				
Pre-requisites (and Co-requisites and Impermissible combination)		at least 24 credits of BIOL2XXX le	evel courses			
,	,					
·	N			Examination		
Offer in 2014 - 2015	·			Examination		
Offer in 2014 - 2015 Offer in 2015 - 2016	N			Examination		
Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade	N N	TBC		Examination		
Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade	N N A+ to F	TBC TBC		Examination		
Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade	N N A+ to F A B			Examination		
Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade	N N A+ to F	TBC		Examination		
Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade	N N A+ to F A B C	TBC TBC		Examination		
Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade Grade Descriptors	N N A+ to F A B C D Fail	TBC TBC TBC TBC		Examination		
Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade Grade Descriptors Course Type	N N A+ to F A B C D Fail Lecture wit	TBC TBC TBC TBC TBC TBC		Examination		
Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade Grade Descriptors  Course Type Course Teaching	N N A+ to F A B C D Fail Lecture wit	TBC TBC TBC TBC TBC TBC	Details	Examination	No. of Hours	
Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade Grade Descriptors  Course Type Course Teaching	N N A+ to F A B C D Fail Lecture wit Activities Lectures	TBC TBC TBC TBC TBC TBC TBC	Details	Examination	No. of Hours	
Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade Grade Descriptors  Course Type Course Teaching	N N A+ to F A B C D Fail Lecture wit Activities Lectures Laboratory	TBC TBC TBC TBC TBC TBC	Details	Examination	No. of Hours	
Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade Grade Descriptors Course Type Course Teaching	N N A+ to F A B C D Fail Lecture wit Activities Lectures Laboratory Field work	TBC TBC TBC TBC TBC TBC	Details	Examination	No. of Hours 2- 2- 3-	
Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade Grade Descriptors Course Type Course Teaching	N N A+ to F A B C D Fail Lecture wit Activities Lectures Laboratory	TBC TBC TBC TBC TBC TBC	Details	Examination	No. of Hours 24 24 36	
Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade Grade Descriptors  Course Type Course Teaching & Learning Activities	N N A+ to F A B C D Fail Lecture wit Activities Lectures Laboratory Field work	TBC TBC TBC TBC TBC TBC	Details Details	V	No. of Hours 24 24 36 20 Veighting in fina	
Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade Grade Descriptors  Course Type Course Teaching & Learning Activities  Assessment Methods	N N A+ to F A B C D Fail Lecture wit Activities Lectures Laboratory Field work Reading /	TBC TBC TBC TBC TBC Self study		V	No. of Hours 24 36 20 Veighting in fina	
Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade Grade Descriptors  Course Type Course Teaching & Learning Activities  Assessment Methods and Weighting	N N A+ to F A B C D Fail Lecture wit Activities Lectures Laboratory Field work Reading / Methods	TBC TBC TBC TBC TBC Self study		V	No. of Hours 24 24 36 20 Veighting in fina course grade (%	
Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade Grade Descriptors  Course Type Course Teaching & Learning Activities  Assessment Methods	N N A+ to F A B C D Fail Lecture wit Activities Lectures Laboratory Field work Reading / Methods Assignment	TBC TBC TBC TBC TBC TBC Self study		V	No. of Hours 24 36 20  Veighting in final course grade (%	
Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade Grade Descriptors  Course Type Course Teaching & Learning Activities  Assessment Methods	N A+ to F  A B C D Fail Lecture wit Activities Lectures Laboratory Field work Reading /  Methods  Assignment Examination Presentation	TBC TBC TBC TBC TBC TBC Self study		V	No. of Hours 2- 3- 3- Veighting in fina course grade (%	

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In	t۸	rm	nati	ion

BIOL3951 Ecology & biodiv				Academic Year	2014	
Offering Department	Biological	Sciences		Quota	22	
Course Co-ordinator	Dr L Karca	zmarski, Biological Sciences (leszek@l	nku.hk)			
Teachers Involved	Dr L Karca	zmarski, Biological Sciences				
Course Objectives		se is offered as a capstone experience a gy & Biodiversity Major during a field co			relevant to	
Course Contents & Topics	best suit t	Every year a number of different potential courses may be offered. The precise contents will be tailored to best suit the topic and locality involved and will therefore vary according to the specific course being held. The basic contents will involve lectures, seminars and extensive field and follow-up laboratory work. It is essential that students contact the course coordinator for further information on the courses available.				
Course Learning Outcomes	Unders     Establis     Be knot ecosysten     Unders communit	On successful completion of this course, students should be able to:  1. Understand of the biodiversity and primary habitats in the ecosystem studied. 2. Establish the basic skills needed to identify target species associated with the field course. 3. Be knowledgeable about and able to implement sampling techniques for organisms in the particular ecosystems studied. 4. Understand the basic ecology of target species and how biotic and abiotic factors shape focal communities. 5. Be aware of the relationships between humans and the species and habitats of interest.				
Pre-requisites (and Co-requisites and Impermissible combination)	Ecology & Students	least 24 credits of advanced level biol Biodiversity Major. are expected to have completed year 2 tone course is for Ecology & Biodiversit	study satisfactorily.	·	r BIOL4XXX) in the	
Offer in 2014 - 2015	Y 2nd	l sem		Examination	No Exam	
Offer in 2015 - 2016	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.					
	B Evidence of a good grasp of the subject and relevant research techniques. Interest in learning and good-to-moderate familiarity with relevant background reading and case studies. Good handling of field data collection and commendable analytical skills. Good evidence of critical thought (although not always independent), with an appreciable use of fundamental concepts and consideration of broader comparative perspective in drawing logical conclusions. Good abilities of independent work, effective presentation skills with logical and analytical argumentation. Work more than sufficient for what is required at degree level.					
	Demonstrate an adequate, but incomplete grasp of the subject and relevant research techniques. Moderate familiarity with relevant background reading and case studies, but no interest in learning beyond the adequate average level. Evidence of logical critical thinking (although not always independent), with mostly good use of fundamental concepts to draw logical conclusions. Fair presentation skills, with mostly correct argumentation, but limited (or no) abilities to integrate broader concepts. Work sufficient for what is required for degree level.					
	D Demonstrate some grasp of the subject, but only partial and with limited understanding of relevant research concepts and research techniques. Some familiarity with relevant case studies, but insufficient evidence of background reading and limited abilities of critical independent thinking. Ineffective presentation skills with generally weak logical argumentation with restricted ability of drawing appropriate conclusions. Work barely meets what is required at degree level.					
	Fail  No evidence of basic a minimum grasp of the subject and the minimum relevant research techniques. No evidence of background reading and no familiarity with any relevant examples and case studies. Inadequate evidence of coherent logical thought; ineffective presentation skills with poor argumentation and no abilities to draw meaningful conclusions. Work fails to reach degree level.					
Course Type	Field cam	ps				
Course Teaching	Activities	S	Details		No. of Hours	
& Learning Activities	Field wor	k			42	
	Reading	/ Self study			100	
Assessment Methods and Weighting	Methods		Details		Weighting in final course grade (%)	
	Assignme	ents			35	
	Report project report		project report (investigation & pre		65	
Required/recommended reading and online materials	Students	will be directed to relevant scientific liter	rautre and websites	1		
Course Website	http://www	v.biosch.hku.hk/ecology/lsc/				
Additional Course Information	Subclass Subclass Enrollmen	majoring in E&B can choose either one A: Marine Mammal Field Course (2nd s B: Animal Behaviour Field Course (2nd at Procedure: se is open to enrollment only during t	semester)		ester. Students are	
		220	aaa, a, op politic	2114 001116	otaaama are	

required to submit a brief (maximum 1-page) application letter (PDF file) via e-mail to the Course Coordinator (leszek@hku.hk) not later than 11 January 2016. The application shall include the following:

1. Personal and academic details

2. ID photograph

3. Brief description of academic interests

4. GPA

5. Pre-requisite courses taken and grades received (if pre-requisites are not met, a reasoned request for waiver)

All applications will be reviewed prior to the commencement of the 2nd semester and results will be announced within the 1st week of the add/drop period of the 2nd semester.

BIOL3991 Directed studi	es in ecoi	ogy & blodiversity (o cred	113)	cademic Year	2014	
Offering Department	Biologica	al Sciences	Q	uota	50	
Course Co-ordinator	Dr M Sur	n, Biological Sciences (meisun@	Dhku.hk)			
Teachers Involved	Supervis	ors and examiners from acaden	nic staff, Biological Sciences			
Course Objectives			ating capstone experience for all eir knowledge and skills obtained fr		odiversity Major	
Course Contents & Topics	student's commitm the cours various r	The directed study can be a review of literature on a specific topic, or a lab or field study that enhances the student's understanding of the topic in the field of ecology & biodiversity . The student should obtain the commitment of a supervisor in the area of the dissertation topic before submitting the registration form for the course (available from the General Office of School of Biological Sciences). Supervisor will introduce various methodologies/techniques and guide students to completion of the dissertation. Teaching will be informal and students will gain knowledge through discussion and feedback from their supervisors.				
Course Learning Outcomes	On succe	essful completion of this course,	students should be able to:			
	2. Have a 3. Apply	1. Acquaint with the process of science. 2. Have a better understanding of the nature of ecology & biodiversity. 3. Apply scientific methods to address important issues in various biological disciplines. 4. Develop the key intellectual skills that will be valubale for all scientific studies.				
Pre-requisites (and Co-requisites and Impermissible combination)	Ecology	at least 24 credits of advanced & Biodiversity Major. stone course is for Ecology & Bi	level biological sciences courses (lodiversity Major students only.	BIOL3XXX or E	BIOL4XXX) in the	
Offer in 2014 - 2015	N		E	xamination		
Offer in 2015 - 2016	Υ		'		'	
Course Grade	A+ to F					
Grade Descriptors	A	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.				
	В	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.				
	С	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 analytical skills. Demonstrate adequate but not necessarily critical, assessment of findings 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 scientific approach to test research hypothesis. Show fair organizational and/or analytical skills. Demonstrate confused and poorly organized assessment of findings and limited presentation of research work.				
	Fail  Evidence of poor or inadequate understanding and grasp of the subject matter such that most of the learning outcomes are not attained. Poor critique and knowledge of relevant literature and identification of research hypothesis. Badly designed scientific approach to test research hypothesis. Show little evidence of appropriate organizational and/or analytical skills. Demonstrate incorrect interpretation and assessment of findings and poor presentation of research work.					
Course Type	Project-b	pased course				
Course Teaching	Activitie	es	Details		No. of Hours	
& Learning Activities	Reading	g / Self study	at least 120 hours dissertation or project	on the	120	
Assessment Methods and Weighting	Method	İs	Details		eighting in fina ourse grade (%	
	Oral pre	esentation	15 minutes (Plus 5 minutes and answers)		20	
	Mid-term written essay plan (20%), Written report 6000-7000 words (excluding figures and references) (80%)			80		
		references) (80%)				
Course Website	http://ww	w.biosch.hku.hk/ecology/lsc/	<u> </u>			

dissertation or project. Recommended reading may be assigned.

BIOL3992 Directed stud	L3992 Directed studies in food & nutritional science (6 credits)		Acade	mic Year	2014	
Offering Department	Biologica	l Sciences	Quota		50	
Course Co-ordinator	Dr M Sur	n, Biological Sciences (meisun@hku.hk)				
eachers Involved	Supervis	ors and examiners from academic staff, I	Biological Sciences			
Course Objectives		rse aims to provide a stimulating capst duates to integrate and apply their knowled			l Science Majo	
Course Contents & Topics	student's commitm the cours various r	he directed study can be a review of literature on a specific topic, or a lab or field study that enhances the rudent's understanding of the topic in the field of food & nutritional science. The student should obtain the formitment of a supervisor in the area of the dissertation topic before submitting the registration form for the course (available from the General Office of School of Biological Sciences). Supervisor will introduce arious methodologies/techniques and guide students to completion of the dissertation. Teaching will be formal and students will gain knowledge through discussion and feedback from their supervisors.				
Course Learning Outcomes	S On succe	essful completion of this course, students	should be able to:			
	2. have a 3. apply s	acquaint with the process of science.     have a better understanding of the nature of food & nutritional science.     apply scientific methods to address important issues in various biological disciplines.     develop the key intellectual skills that will be valubale for all scientific studies.				
Pre-requisites and Co-requisites and mpermissible combination	Food & N	at least 24 credits of advanced level bio lutritional Science Major. stone course is for Food & Nutritional Sci	,	3XXX or B	IOL4XXX) in th	
Offer in 2014 - 2015	N	Examination				
offer in 2015 - 2016	Υ					
ourse 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	B Work showing some evidence of originality and insight in identifying, generating and communicating competing arguments, perspectives or problem solving approaches; demonstrating substantial understanding of fundamental concepts of the field of study; adequate grasp of the topic from background reading and analysis; a systematic exploration of the topic which may include an attempt at critical comment or appraisal; regular support provided from the literature; comprehensive and up-to-date references included; main points fully elaborated; summary given in the final chapter/paragraphs; communicating information and ideas clearly and fluently, demonstrating good organizational, rhetorical and presentational skills. The length of the dissertation meet the specified requirements. Most aspects conform to a high academic standard.				
	С	Work showing no evidence of originality and insight, but the presentation demonstrated adequate understanding and comprehension of most aspects of the dissertation topic; essential topic materials have been read and acknowledged; the main points presented in logically sequential paragraphs; reasonably balanced discussion of the major issues; acceptable interpretation of the topic, some explanation, illustration and support provided from the literature; summary given in the final chapter/paragraphs; most presentation details met (front page, margin, legibility, citations correctly reported and tabulated, etc.); few typos or grammatical errors; Most aspects conform to an acceptable academic standard.				
	D	Demonstrating superficial or partial or faulty understanding of the fundamental concepts of the field of study; showing the bare minimum of information, poorly digested and not very well organized in presentation; irrelevant material; showing no evidence of critical thinking; arguments undeveloped or inappropriate or unsupported; lack of clarity or structure in communicating information or ideas. dissertation topic not fully covered; discussion too brief or just repeating the data or findings; overuse quotations with little explanation; insufficient support from literature; reading not well incorporated into the text; limited acknowledgements and light bibliography; some major points missed. Minimum conform to an acceptable academic standard.				
	Fail	Fail  The dissertation topic was not covered acceptably; demonstrating evidence of poor knowledge, clear deficiencies in understanding fundamental concepts; materials largely irrelevant; incomplete or confusing communication of information or ideas; unreflective; incoherent argument; complete misinterpretation of the topic or data; no evidence of reading (no acknowledgements or bibliography); structure confused or not discernible; Fail to meet most or all of the basic requirements of the course. The written work is not of an academic standard.				
Course Type	Project-b	ased course				
Course Teaching	Activitie	<u></u>	Details		No. of Hour	
Learning Activities	Reading	/ Self study	at least 120 hours on dissertation or project	the	12	
ssessment Methods nd Weighting	Method	s	Details		eighting in fina ourse grade (%	
	Oral pre	sentation	15 minutes (Plus 5 minutes questions and answers).	s for	2	
	Researc	Research report 6000-8000 words (excluding figures and references).				
Course Website	http://mo	odle.hku.hl/				
Additional Course nformation	methods	meetings between the supervisor and and on how to think and write sciention or project. Recommended reading ma	fically. Students should spend			

BIOL3993 Directed stud credits)	ies in Mole	cular biology & biotechnolog	<b>уу (б</b>	Academic Year	2014	
Offering Department	Biologica	l Sciences		Quota	50	
Course Co-ordinator	Dr M Sun	, Biological Sciences (meisun@hku	ı.hk)		'	
Feachers Involved	Superviso	ors and examiners from academic s	taff, Biological Sciences			
Course Objectives		rse aims to provide a stimulating of dergraduates to integrate and apply				
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 enhances the student's understanding of the topic in the field of molecular biology & biotechnology. The student should obtain the commitment of a supervisor in the area of the dissertation topic before submitting the registratior form for the course (available from the General Office of School of Biological Sciences). Supervisor will introduce various methodologies/techniques and guide students to completion of the dissertation. Teaching will be informal and students will gain knowledge through discussion and feedback from their supervisors.				
Course Learning Outcomes	1. acquai 2. have a 3. apply s	On successful completion of this course, students should be able to:  1. acquaint with the process of science. 2. have a better understanding of the nature of molecular biology & biotechnology. 3. apply scientific methods to address important issues in various biological disciplines. 4. develop the key intellectual skills that will be valubale for all scientific studies.				
Pre-requisites and Co-requisites and mpermissible combination	Molecula	at least 24 credits of advanced lever r Biology & Biotechnology Major. stone course is for Molecular Biology	-	•	BIOL4XXX) in the	
Offer in 2014 - 2015	N			Examination		
Offer in 2015 - 2016	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 presentations kills. 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 final chapter/paragraphs; communicating information and ideas clearly and fluently, demonstrating good organizational, rhetorical and presentational skills. The length of the dissertation meet the specified requirements. Most aspects conform to a high academic standard				
	С	Work showing no evidence of originality and insight, but the presentation demonstrated adequate understanding and comprehension of most aspects of the dissertation topic; essential topic materials have been read and acknowledged; the main points presented in logically sequential paragraphs; reasonably balanced discussion of the major issues; acceptable interpretation of the topic, some explanation, illustration and support provided from the literature; summary given in the final chapter/paragraphs; most presentation details met (front page, margin, legibility, citations correctly reported and tabulated, etc.); few typos or grammatical errors; Most aspects conform to an acceptable academic standard.				
	D	Demonstrating superficial or partial or faulty understanding of the fundamental concepts of the field of study; showing the bare minimum of information, poorly digested and not very well organized in presentation; irrelevant material; showing no evidence of critical thinking; arguments undeveloped or inappropriate or unsupported; lack of clarity or structure in communicating information or ideas. dissertation topic not fully covered; discussion too brief or just repeating the data or findings; overuse quotations with little explanation; insufficient support from literature; reading not well incorporated into the text; limited acknowledgements and light bibliography; some major points missed. Minimum conform to an acceptable academic standard.				
	Fail					
Course Type	Project-b	ased course				
Course Teaching	Activitie	es	Details		No. of Hour	
& Learning Activities	Reading	/ Self study	at least 120 hour dissertation or projec		12	
Assessment Methods and Weighting	Methods	S	Details		Veighting in fina course grade (%	
	Oral pres	sentation	15 minutes (Plus 5 questions and answe		2	
	Researc	Research report Written report 6000-8000 words (excluding figures and references).				
Course Website	http://mod	odle.hku.hk/				
Additional Course Information	methods,	meetings between the supervisor and on how to think and write so on or project. Recommended reading	cientifically. Students should			

	gies in biolo	gical sciences (6 credits)	Academic Ye	ear 2014		
Offering Department	Biologica	Sciences	Quota	50		
Course Co-ordinator	Dr M Sun	, Biological Sciences (meisun@hku.	hk)			
Teachers Involved	Superviso	ors and examiners from academic st	aff, Biological Sciences			
Course Objectives			g capstone experience for all Biolog nowledge and skills obtained from the M			
Course Contents & Topics	student's commitm course (a methodol	The directed study can be a review of literature on a specific topic, or a lab or field study that enhances the student's understanding of the topic in the field of biological sciences. The student should obtain the commitment of a supervisor in the area of the dissertation topic before submitting the registration form for the course (available from the General Office of School of Biological Sciences). Supervisor will introduce various methodologies/techniques and guide students to completion of the dissertation. Teaching will be informal and students will gain knowledge through discussion and feedback from their supervisors.				
Course Learning Outcome	1. acquai 2. have a 3. apply s	On successful completion of this course, students should be able to:  1. acquaint with the process of science. 2. have a better understanding of the nature of biological sciences. 3. apply scientific methods to address important issues in various biological disciplines. 4. develop the key intellectual skills that will be valubale for all scientific studies.				
Pre-requisites (and Co-requisites and Impermissible combination	Biologica	at least 24 credits of advanced level I Sciences Major. stone course is for Biological Science	biological sciences courses (BIOL3XX) as Major students only.	X or BIOL4XXX) in the		
Offer in 2014 - 2015	Y Ye	ar long	Examination	No Exam		
Offer in 2015 - 2016	Υ		l l			
Course Grade	A+ to F					
Grade Descriptors	A	dissertation topic, showing a thorough gr objectives of the research; comprehens support from the literature; comprehensi critical evaluations of the main points or accurate summary. All chapters/paragi demonstrating excellent organizational,	nip and originality; virtually flawless presentation vasp of the topic from background reading and analive exploration of the topic, personal synthesis we and up-to-date references integrated into argproblems and their solutions and implications; tho aphs are well-connected and presented logic interiorial and presentational skills. The length of the dissertation conform to a high academic sta	lysis; clear statement of the of the issues with detailed ment or logical reasoning; ught-provoking discussions; ally with clarity of goals, f the dissertation meet the		
	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 final chapter/paragraphs; communicating information and ideas clearly and fluently, demonstrating good organizational, rhetorical and presentational skills. The length of the dissertation meet the specified requirements. Most aspects conform to a high academic standard.				
	С	Work showing no evidence of originality and insight, but the presentation demonstrated adequate understanding and comprehension of most aspects of the dissertation topic; essential topic materials have been read and acknowledged; the main points presented in logically sequential paragraphs; reasonably balanced discussion of the major issues; acceptable interpretation of the topic, some explanation, illustration and support provided from the literature; summary given in the final chapter/paragraphs; most presentation details met (front page, margin, legibility, citations correctly reported and tabulated, etc.); few typos or grammatical errors; Most aspects conform to an acceptable academic standard.				
	D	Demonstrating superficial or partial or faulty understanding of the fundamental concepts of the field of study; showing the bare minimum of information, poorly digested and not very well organized in presentation; irrelevant material; showing no evidence of critical thinking; arguments undeveloped or inappropriate or unsupported; lack of clarity or structure in communicating information or ideas. dissertation topic not fully covered; discussion too brief or just repeating the data or findings; overuse quotations with little explanation; insufficient support from literature; reading not well incorporated into the text; limited acknowledgements and light bibliography; some major points missed. Minimum conform to an acceptable academic standard.				
	Fail	understanding fundamental concepts; information or ideas; unreflective; incohe reading (no acknowledgements or biblio	acceptably; demonstrating evidence of poor know materials largely irrelevant; incomplete or cor rent argument; complete misinterpretation of the tr graphy); structure confused or not discernible; Fa tten work is not of an academic standard.	fusing communication of opic or data; no evidence of		
Course Type	Project-b	ased course				
Course Teaching	Activitie	98	Details	No. of Hours		
& Learning Activities	Reading	/ Self study	at least 120 hours on the dissertation or project	120		
Assessment Methods and Weighting	Method	S	Details	Weighting in fina course grade (%)		
	Oral pre	sentation	15 minutes (Plus 5 minutes for questions and answers).	20		
	Researc	Written report 6000-8000 words (excluding figures and references).				
Course Website	http://mod	odle.hku.hk/				
Additional Course Information	Regular		and student. Guidance from the super			

BIOL4201 Public health nut		-		cademic Year	2014	
Offering Department	Biological		-	uota	90	
Course Co-ordinator	Dr J M F V	Van, Biological Sciences (jmfwan@hku.h	hk)			
Teachers Involved	Dr J M F V	Van, Biological Science				
Course Objectives	human he	Ifth nutrition unites social sciences and b alth through programs aimed at enhand rview of the professional practice and es	cing good nutritional p	ractices. This c	ourse presents a	
Course Contents & Topics	programs. Undernutri Epidemiol	Public health nutrition: overview, nature and identification of problems, objectives of intervention or organs. The epidemiological study of diet: disease associations. Development of dietary guidelines. Undernutrition and overnutrition: definitions, prevalence, public health consequences, and interventions. Epidemiology, public health consequences, and elimination of vitamin and mineral deficiencies. Disease prevention. Educating the public for healthy eating and food safety.				
Course Learning Outcomes	On successful completion of this course, students should be able to:  1. Have a broad knowledge of the scope and methodologies of public health nutrition.  2. Have a clear technical understanding of a range of selected examples of public health nutrition cases in less-developed and developed countries.  3. Be able to formulate recommendations for action for nutritional interventions at the community level.  4. Understand the impact of socio-cultural factors on community food choices and consequently on health outcomes.					
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in BI	Pass in BIOL3201 Food chemistry or BIOL3202 Nutritional biochemistry				
Offer in 2014 - 2015	Y 2nd	sem	Ex	camination	May	
Offer in 2015 - 2016	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. 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.					
	B Demonstrate 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, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills. Apply effective laboratory /fieldwork skills and techniques. Correct use of data of results to draw appropriate conclusions. Apply effective organizational and presentational skills.					
	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. 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.					
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Partial but limited grasp of the subject, retention of some relevant information of the subject. 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 / 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 little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. 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. Organization and presentational skills are minimally effective or ineffective. 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-ba	ased course				
Course Teaching	Activities	3	Details		No. of Hours	
& Learning Activities	Lectures				24	
	Tutorials		30 hours student invreport, & 12 hotutorials/presentations	ours of	42	
	Reading / Self study				100	
Assessment Methods and Weighting					Veighting in fina course grade (%)	
	Assignme	ents			30	
	Examinat	ion			70	
Required/recommended reading and online materials		alth Nutrition (The Nutrition Society Textb , BM Margetts, JM Kearney, L Arab (Ed				
Course Website	http://moo	dle.hku.hk/				
Additional Course Information	Th:	e will be offered subject to a minimum er	nrollmont number and	! - - -! !# <b>-#</b> #		

BIOL4204 Diet, Drain function and behavior (6 credits)	unction and behavior (6 credits) Academic Year 2014
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Offering Department	Biological S	Sciences		Quota	40	
Course Co-ordinator	Dr E T S Li	, Biological Sciences (etsli@hku.hk)			'	
Teachers Involved	Dr E T S Li	, Biological Sciences				
Course Objectives		It the impact of nutrient provision on brand diet on mental function and behav		ction, and to dis	cuss various effects	
Course Contents & Topics	function; D	tals of the central nervous system; Nietary CNS stimulants; Neurotransmitt ts of dietary behaviour.	lutrition & brain devo ers, drugs & behavio	elopment; Diet, lour; Physiologica	earning & memory Il and socio-cultural	
Course Learning Outcomes	1. Understa 2. Be able 3. Understa	On successful completion of this course, students should be able to:  1. Understand the basic structure and functions of the brain and how nutrition influences its development.  2. Be able to explain the consequences of nutrient inadequacy on cognition.  3. Understand the differences between bioactive food ingredients and drugs.  4. Be able to critically evaluate and interpret the internal and external cues that determine dietary behaviour.				
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in BIO	ass in BIOL3204 Nutrition and the life cycle or already enrolled in this course				
Offer in 2014 - 2015	N	Examination				
Offer in 2015 - 2016	Υ	,				
Course Grade	A+ to F	A+ to F				
Grade Descriptors	A Demonstrate thorough grasp of the subject matter covered. Show exceptional ability on problem identification and solving. Show outstanding ability to critically analyze and interpret 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.					
	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 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.					
	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 problem solving. Fail to integrate information and identify problems. Seriously deficient in ability to analyze and interpret scientific data and draw conclusions. Demonstrate poor organization / writing skills.					
Course Type	Lecture-ba	sed course				
Course Teaching	Activities		Details		No. of Hours	
& Learning Activities	Lectures				36	
	Tutorials		tutorials/group discussions/semina	rs	12	
	Reading /	Self study			100	
Assessment Methods and Weighting	Methods		Details		Weighting in final course grade (%)	
	Assignme	nts			30	
	Examinati				70	
Required/recommended reading and online materials	Press, 200 Lieberman Nutritional	Copper J. R., Bloom F. E. & Roth R. H.: The Biochemical Basis of Neuropharmacology. Oxford University Press, 2003 Lieberman H. R., Kanarek R. B. & Prasad C.: Nutritional Neuroscience. CRC Press, 2005 Nutritional Neuroscience (Journal) Physiology and Behavior (Journal)				
Course Website	http://mood	,				
Additional Course Information		e will be offered subject to a minimum	enrollment number ar	nd availability of t	eachers	
	. The course	20 onoroa oabjoot to a minimum t	Jiiiiioin Hullibol al	aranability Of t		

BIOL4205 Food processin	g and engineering (6 credits)	Academic Year	2014		
Offering Department	Biological Sciences Quota 60				
Course Co-ordinator	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 preservation technology. To cover key engineering principles relevant to the food industry. Students will gain hands-on experience with selected food processing and preservation techniques.				
Course Contents & Topics	Food processing is a multidisciplinary field combining applied physical properties and requirements. This course introduces the technical known effective production and commercialization of food products and serve processes, equipment and machinery used to convert raw agricultural processes.	nowledge required to ices. The design and	o implement cost- d development of		

	principles	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 will 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:  1. Understand basic principles of food processing methods and preservation technology.  2. Be able to apply their knowledge and practical skills to process and develop food products.  3. Demonstrate in-depth understanding of selected methods and problems in food processing and preservation.					
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in B	IOL3201 Food chemistry				
Offer in 2014 - 2015	Y 1st	sem	Examination	n Dec		
Offer in 2015 - 2016	Υ			'		
Course Grade	A+ to F					
Grade Descriptors	A	Demonstrate thorough grasp of the subject may the changes that take place in variety of for advanced techniques and equipment for a designing, producing and evaluating solutions and techniques and analysis of data and result	od during preparation, processing and s variety of food-specific purposes. Demo of excellent quality for specific food purp	storage. Identifies and uses onstrates advance skills in oses. Critically use lab skills		
	В					
	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 purposes. Demonstrates adequate skills in designing, producing and evaluating solutions of sound quality for specific food purposes. Use lab skills and techniques and analysis of data and results to draw moderately appropriate conclusions.					
	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 w	ith laboratory component course				
Course Teaching	Activitie	s	Details	No. of Hours		
& Learning Activities	Lectures			24		
	Laborato	ry	laboratory/field trip/seminar	24		
	Tutorials			6		
	Reading	/ Self study		100		
Assessment Methods and Weighting	Methods	3	Details	Weighting in final course grade (%)		
	Examina	tion		70		
	Laborato	ry reports		30		
Required/recommended reading and online materials		cessing Technology-Principles & Practic ations in Food Processing - 2nd ed. R.L				
Course Website	http://mod	odle.hku.hk/				
Additional Course Information	This cours	se will be offered subject to a minimum e	enrollment number and availability	of teachers.		

BIOL4207 Meat and dairy	sciences (6 credits)	Academic Year	2014			
Offering Department	Biological Sciences	Quota	50			
Course Co-ordinator	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 dairy production, processing and marketing.					
Course Contents & Topics	Principles of animal nutrition and feed formulation; genetic se slaughter and carcass inspection; meat preservation and safety; semphasizing fermented products such as cheese and yogurt; product marketing.	ensory quality of meat	. Dairy processing			
Course Learning Outcomes	On successful completion of this course, students should be able	0:				
	226					

	2. Demonused in pr	stand modern practices in meat and on strate a knowledge and understand rocessing, preservation or improvem strate knowledge of selected issues	ling of meat and da ent of meat and dair	ry products.	nd the technologies	
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in B	IOL3201 Food chemistry				
Offer in 2014 - 2015	Y 2nd	d sem		Examination	May	
Offer in 2015 - 2016	Υ			'	'	
Course Grade	A+ to F	+ to F				
Grade Descriptors	A	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.				
	В	Demonstrate substantial grasp of the sul logical thinking with some evidence of techniques and analysis of data and re Demonstrate effective team-based organi	competence in profess esults to draw generally	sional-level problem solvir appropriate conclusions t	ng. Use lab skills and	
	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.				
	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 w	rith laboratory component course				
Course Teaching	Activitie	.s	Details		No. of Hours	
& Learning Activities	Lectures		Johns		24	
	Laboratory				24	
	Tutorials				6	
	Reading / Self study				100	
Assessment Methods and Weighting	Methods		Details		Weighting in final course grade (%)	
	Examina	tion			80	
	Laborato	ory reports			20	
Required/recommended reading and online materials		Lawrie's Meat Science. RA Lawrie (CRC Press, 2006) Dairy Processing and Quality Assurance. RC Chandan, A Kilara, N Shah (Eds) (Blackwell, 2008)				
Course Website	http://mod	odle.hku.hk/				
000.00 11000.00		http://moodle.hku.hk/				

Offering Department   Biological Sciences   Quota   40	BIOL4209 Functional food	s (6 credits)	Academic Year	2014
Teachers Involved  Dr M F Wang, Biological Sciences  To provide a fundamental understanding of the rapidly emerging functional food/nutraceutical industry an emphasis on the history, regulation, chemical basis and quality control of healthy ingredients/products.  Course Contents & Topics  Concept, history and global regulation of functional foods and nutraceuticals; classification of functional and nutraceuticals; classification of functional foods and nutraceuticals; proteins, pigments and dietary fibers as healthy food ingredients; health benefits of dietary phenolics, terpe phytosterols and sulphur-containing compounds; probiotics and prebiotics; small berries, spices, teas herbs for health; quality control and assurance of functional foods and nutraceuticals.  On successful completion of this course, students should be able to:  1. Understand the definition and global regulation of functional foods and nutraceuticals. 2. Have substantial chemical knowledge of functional food and nutraceutical products. 3. Be able to describe examples of functional food and nutraceutical industry. 5. Understand major techniques and technologies for quality control and manufacturing of heaproducts.  Pre-requisites (and Co-requisites and	Offering Department	Biological Sciences	Quota	40
Course Objectives  To provide a fundamental understanding of the rapidly emerging functional food/nutraceutical industry an emphasis on the history, regulation, chemical basis and quality control of healthy ingredients/products.  Concept, history and global regulation of functional foods and nutraceuticals; classification of funct foods and nutraceuticals based on their chemical structures; unsaturated fatty acids, proteins, pigments and dietary fibers as healthy food ingredients; health benefits of dietary phenolics, terpe phytosterols and sulphur-containing compounds; probiotics and prebiotics; small berries, spices, teasherbs for health; quality control and assurance of functional foods and nutraceuticals.  Course Learning Outcomes  On successful completion of this course, students should be able to:  1. Understand the definition and global regulation of functional foods and nutraceuticals.  2. Have substantial chemical knowledge of functional food and nutraceutically their claimed health benefits 4. Demonstrate understanding of the current functional food and nutraceutical industry.  5. Understand major techniques and technologies for quality control and manufacturing of heaproducts.  Pre-requisites (and Co-requisites and	Course Co-ordinator	Dr M F Wang, Biological Sciences (mfwang@hku.hk)		
an emphasis on the history, regulation, chemical basis and quality control of healthy ingredients/products.  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, pigments and dietary fibers as healthy food ingredients; health benefits of dietary phenolics, terpe phytosterols and sulphur-containing compounds; probiotics and prebiotics; small berries, spices, teas herbs for health; quality control and assurance of functional foods and nutraceuticals.  Course Learning Outcomes  On successful completion of this course, students should be able to:  1. Understand the definition and global regulation of functional foods and nutraceutical products.  2. Have substantial chemical knowledge of functional food and nutraceutical products.  3. Be able to describe examples of functional food and nutraceutical industry.  5. Understand major techniques and technologies for quality control and manufacturing of heap products.  Pre-requisites  (and Co-requisites and	Teachers Involved	Dr M F Wang, Biological Sciences		
foods and nutraceuticals based on their chemical structures; unsaturated fatty acids, proteins, pigments and dietary fibers as healthy food ingredients; health benefits of dietary phenolics, terpe phytosterols and sulphur-containing compounds; probiotics and prebiotics; small berries, spices, teas herbs for health; quality control and assurance of functional foods and nutraceuticals.  Course Learning Outcomes  On successful completion of this course, students should be able to:  1. Understand the definition and global regulation of functional foods and nutraceuticals. 2. Have substantial chemical knowledge of functional food and nutraceutical products. 3. Be able to describe examples of functional food and nutraceutical industry. 4. Demonstrate understanding of the current functional food and nutraceutical industry. 5. Understand major techniques and technologies for quality control and manufacturing of heap products.  Pre-requisites (and Co-requisites and	Course Objectives	an emphasis on the history, regulation, chemical basis and quality		
1. Understand the definition and global regulation of functional foods and nutraceuticals. 2. Have substantial chemical knowledge of functional food and nutraceutical products. 3. Be able to describe examples of functional foods and interpret critically their claimed health benefits 4. Demonstrate understanding of the current functional food and nutraceutical industry. 5. Understand major techniques and technologies for quality control and manufacturing of heap products.  Pre-requisites (and Co-requisites and)  Pass in BIOL3201 Food chemistry or BIOL3202 Nutritional biochemistry	Course Contents & Topics	foods and nutraceuticals based on their chemical structures; ur pigments and dietary fibers as healthy food ingredients; health be phytosterols and sulphur-containing compounds; probiotics and pre	nsaturated fatty acid enefits of dietary phe biotics; small berries	s, proteins, food enolics, terpenes,
(and Co-requisites and	Course Learning Outcomes	Understand the definition and global regulation of functional foods     Have substantial chemical knowledge of functional food and nuts     Be able to describe examples of functional foods and interpret cri     Demonstrate understanding of the current functional food and nu     Understand major techniques and technologies for quality c	and nutraceuticals. aceutical products. ically their claimed he traceutical industry.	
impermissione combination,		Pass in BIOL3201 Food chemistry or BIOL3202 Nutritional biochem	istry	

Offer in 2014 - 2015	Y 1st	t sem		Examination	Dec	
Offer in 2015 - 2016	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 knowledge to draw appropriate and insightful conclusions to real-world problems. Demonstrate highly effective team-based organizational and presentational skills.				
	B Demonstrate substantial grasp of the subject matter covered. Show evidence of analytical and critical abilities and logical thinking with some evidence of competence in professional-level problem solving. Use knowledge to draw generally appropriate conclusions to real-world problems. Demonstrate effective team-based organizational and presentational skills.					
	Demonstrate general but incomplete grasp of the subject matter covered. Show some evidence of analytical and critical abilities and logical thinking with limited competence in professional-level problem solving. Use knowledge 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 knowledge to draw sometimes appropriate but often erroneous conclusions to real-world problems. Demonstrate team-based organizational and presentational skills of limited effectiveness.				
	Fail	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 knowledge ineffectively, leading generally to inappropriate and usually erroneous conclusions to real-world problems. Demonstrate ineffectiveness team-based organizational and presentational skills.				
		Lecture-based course				
Course Type	Lecture-b	pased course				
Course Teaching	Lecture-b		Details		No. of Hours	
Course Teaching		25	Details		No. of Hours	
Course Teaching	Activitie	es S	Details tutorials/seminars			
Course Type Course Teaching & Learning Activities	Activitie Lectures Tutorials	es S			36	
Course Teaching	Activitie Lectures Tutorials	es s s / Self study			36 12	
Course Teaching & Learning Activities  Assessment Methods	Activities Lectures Tutorials Reading	es s s / Self study	tutorials/seminars		36 12 100 Weighting in final	
Course Teaching & Learning Activities  Assessment Methods	Activitie Lectures Tutorials Reading	es  / Self study s	tutorials/seminars		36 12 100 Weighting in final course grade (%)	
Course Teaching & Learning Activities  Assessment Methods	Activities Lectures Tutorials Reading  Methods Assignm Examina  R. E. C. V	es  / Self study s	tutorials/seminars  Details  and Functional Foods	(CRC Press, 2007)	36 12 100 Weighting in final course grade (%) 30 70	
Course Teaching & Learning Activities  Assessment Methods and Weighting  Required/recommended reading	Activitie Lectures Tutorials Reading Methods Assignm Examina R. E. C. V. C. M. Has	es  / Self study  s  nents  wition  Wildman: Handbook of Nutraceuticals	tutorials/seminars  Details  and Functional Foods	(CRC Press, 2007)	36 12 100 Weighting in final course grade (%) 30 70	

BIOL4210 Food product de	evelopmer	t (6 credits)	Academic Year	2014		
Offering Department	Biological	Sciences	Quota	40		
Course Co-ordinator	Dr M F W	ang, Biological Sciences (mfwang@hku.hk)				
Teachers Involved	Dr M F W	ang, Biological Sciences				
Course Objectives		To introduce the key concepts and techniques used in food product development. To provide small group experience in the design, development and production of a new food product.				
Course Contents & Topics	prototype	History and future of the food industry; industrial product development process; idea generation and prototype development for new food products; quality management and legal protection; marketing strategies; food labeling; food package design; new product development for different food industries.				
Course Learning Outcomes	1. Unders 2. Know to 3. Demon 4. Have p	On successful completion of this course, students should be able to:  1. Understand the food product development cycle. 2. Know the key steps in new product development. 3. Demonstrate enhanced insight and understanding of current and future trends in the food industry. 4. Have professional level practical experience in new product development. 5. Know the main characteristics of different sectors of the food industry.				
Pre-requisites and Co-requisites and mpermissible combination)	Pass in B	OL3203 Food microbiology or BIOL4205 Food proce	ssing and engineering			
Offer in 2014 - 2015	Y 1st	sem	Examination	Dec		
Offer in 2015 - 2016	Υ					
Course Grade	A+ to F					
Grade Descriptors	A	Demonstrate thorough grasp of the subject matter covered. S thinking, with evidence of creative ability and competence in skills and techniques and analysis of data and results to draw problems. Demonstrate highly effective team-based organization	professional-level problem solv appropriate and insightful con	ing. Critically use lab		
	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 macritical abilities and logical thinking with limited competence in				

			techniques and analysis of data and results to draw moderately appropriate but sometimes erroneous conclusions to real-world problems. Demonstrate moderately effective team-based organizational and presentational skills.				
	D	Demonstrate partial but limited grasp, with retention of some relevant information, of the subject matter covered Show some evidence of coherent and logical thinking, but lacking competence in professional-level problem solving Use lab skills and techniques and analysis of data and results to draw sometimes appropriate but often erroneous conclusions to real-world problems. Demonstrate team-based organizational and presentational skills of limited effectiveness.					
	Fail	Demonstrate little or no grasp, with retention of coherent and logical thinking, and minimal co techniques and analysis of data and results in conclusions to real-world problems. Demonstrat	mpetence in professional-level problem sol effectively, leading generally to inappropriat	ving. Use lab skills and e and usually erroneous			
Course Type	Laboratory and workshop course						
Course Teaching	Activities	3	Details	No. of Hours			
& Learning Activities	Laboratory			48			
	Group work		80-100 hours group project work	100			
	Tutorials		10 lectures + 12 tutorials	22			
	Reading / Self study			100			
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)			
	Assignme	ents	assessment of group product development project including inclass presentation	80			
	Test			20			
Required/recommended reading and online materials	E. Graf an	A. L. Brody and J. B. Lord: Developing New Food Products for a Changing Marketplace (CRC Press, 2007 E. Graf and I. S. Saguy: Food Product Development (Avi Books, 1991) G. W. Fuller: New Food Product Development (CRC Press, 2005)					
Course Website	http://moo	dle.hku.hk/					
Additional Course Information		p://moodle.hku.hk/ is course will be offered subject to a minimum enrollment number and availability of teachers.					

BIOL4301 Fish and fisherie	es (6 credit	s)	Academic Year	2014		
Offering Department	Biological	Sciences	Quota	30		
Course Co-ordinator	Prof Y J Sa	adovy, Biological Sciences (yjsadovy@hku.hk)				
Teachers Involved	Prof Y J Sa	adovy, Biological Sciences				
Course Objectives	and abiotic interactions - to provide to fishery species to cover	- to cover the theoretical and practical aspects of marine fisheries management, fish farming and fisheries conservation using local, regional and global examples				
Course Contents & Topics	interactions the world's regional as relationship	Introduction to course: phylogenetic, biological and ecological concepts and adaptation. Multispecie interactions in marine and freshwater fish assemblages. Fishery theory; how do fisheries work? Status the world's capture fisheries; fish stock assessment and fishery management practices using loca regional and global examples. The roles of mariculture and capture fisheries for seafood supply an relationship to capture fisheries. Fishery management and fish conservation. Conclusion: fish biodiversi and fishery production; ethics of fish research and exploitation; climate change and the future of fish ar fisheries.				
Course Learning Outcomes	On successful completion of this course, students should be able to:  1. Understand the basis of fish species diversity in relation to phylogenetic, ecological and biologic factors.  2. Appreciate the direct and indirect impacts and consequences of human activities on fish species a species assemblages and implications for sseafood security.  3. Understand of the functioning of fisheries and standards of fisheries assessment, development a management.  4. Appreciate the mutual dependency of humans with fished populations in relation to their long-tensustainability.  5. Enhance the ability for critical and synthetic thinking.					
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in BI	OL3301 Marine biology or BIOL3303 Conservation ec	ology			
Offer in 2014 - 2015	Y 2nd	sem	Examination	May		
Offer in 2015 - 2016	Υ		'			
Course Grade	A+ to F					
Grade Descriptors	A	Demonstrate thorough mastery at an advanced level of extensions course learning outcomes. Show strong analytical and critical all thought, ability to integrate and synthesize information, and ability	bilities and logical thinking, wit	h evidence of origina		

	В	Demonstrate substantial command of a broat the course learning outcomes. Show evidend materials and ability to apply knowledge presentational skills. Evidence of clear attention	ce of analytical and critical abilities and logic to familiar and some unfamiliar situations	cal thinking, integration of		
	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 presentational skills. 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. Show limited ability to apply knowledge to solve problems. Apply limited effectiveness in presentational skills. Lack of attention to thoughtful and reflective thinking.				
	Fail	Demonstrate little or no evidence of comma outcomes. Lack of analytical and critical abilit knowledge 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	Activities		Details	No. of Hours		
& Learning Activities	Lectures			24		
	Field work		Field, laboratory, practical and tutorials	36		
	Reading / Self study			100		
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)		
	Assignments			30		
	Examination			60		
	Test			10		
Required/recommended reading and online materials	Science Ltd	3. & Reynolds J. D. (eds): Handbook of d, 2002) a, B. Collette and D. Facey: The Divers	,	·		
Course Website	http://www.	biosch.hku.hk/ecology/lsc/				
Additional Course Information	This course	e will be offered subject to a minimum	enrollment number and availability of	f teachers.		

BIOL4302 Environmental in	mpact asse	essment (6 credits)	Academic Year	2014		
Offering Department	Biological	Sciences	Quota	30		
Course Co-ordinator	Prof R S S	f R S S Wu, Biological Sciences (rudolfwu@hku.hk)				
Teachers Involved		Wu, Biological Sciences ker, Biological Sciences				
Course Objectives		introduce the general principles, processes, techniques, current practices and problems of ronmental impact assessment (EIA).				
Course Contents & Topics	legislation. remediatio audit. Con modeling).	ackground and history of EIA development. Concept of carrying capacity and precautionary principle. EIA gislation. Processes in conducting EIA. Risk assessment and management. Mitigatory measures and mediation. Cost benefit analysis. Socio-economic perspectives and analysis. Project monitoring and idit. Common techniques employed in EIA (e.g. matrix, sequence diagram, causal chain analysis, odeling). Modern EIA instruments (environmental liability, environmental insurance and environmental are). Application of EIA in environmental management. Case studies. Role play exercise.				
Course Learning Outcomes	1. Underst 2. Apply a 3. Evaluate	sful completion of this course, students should be able to: and the operation of EIA systems in Hong Kong and overs variety of techniques in assessing environmental impact. e different options and determine acceptability in environme EIA reports for small scale projects.		nent.		
Pre-requisites (and Co-requisites and Impermissible combination)		Pass in BIOL2103 Biological sciences laboratory course or BIOL2306 Ecology and Evolution; and Any BIOL3XXX course or ENVS3004 Environment, society and economics				
Offer in 2014 - 2015	Y 2nd	sem	Examination	May		
Offer in 2015 - 2016	Υ					
Course Grade	A+ to F					
Grade Descriptors	A	Demonstrate thorough mastery at an advanced level of extensive k course learning outcomes. Show strong analytical and critical abilities thought, ability to integrate and synthesize information, and ability to familiar and unfamiliar situations. Apply highly effective presentations thoughtful and reflective thinking.	and logical thinking, with apply knowledge to a wid	n evidence of origina de range of complex		
	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 material sand 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 course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective presentational skills. Little evidence of clear attention to thoughtful and reflective thinking.				

	D	outcomes. Show evidence of some co- little attempt at integration. Show limit presentational skills. Lack of attention		nalytical and critical abilities and is. Apply limited effectiveness in
	Fail	outcomes. Lack of analytical and critic	of command of knowledge and skills required al abilities, logical and coherent thinking. Sho ation and presentational skills are minimally eff	w very little or no ability to apply
Course Type	Lecture	with laboratory component course		
Course Teaching & Learning Activities	Activiti	es	Details	No. of Hours
& Learning Activities	Lecture	S		24
	Field work		field trip / tutorials	24
	Reading / Self study		student center learning	70
Assessment Methods and Weighting	Method	ls	Details	Weighting in final course grade (%)
	Assignn	nents		50
	Examin	ation		50
Required/recommended reading and online materials	Routledg HKSAR Kong: HI	ge, 2005)	Introduction to Environmental Impadum for Environmental Impact Asse	• •
Course Website	http://ww	w.biosch.hku.hk/ecology/lsc		
Additional Course Information	The cour	rse will be offered subject to a minir	num enrollment number and availabil	lity of teachers.

BIOL4303 Animal behavior	ur (6 credi	ts)	Academic Year	2014
Offering Department	Biological	Sciences	Quota	30
Course Co-ordinator	Dr L Karc	zmarski, Biological Sciences (leszek@hku.hk)		
Teachers Involved	Dr L Karc	zmarski, Biological Sciences		
Course Objectives	provides i mechanis their phys choose m	se teaches students the ways and means of explorin insights into a field of science that investigates everyt ms and functions of specific behaviours; the ways in wical environment and other organisms; how animals finates, reproduce, and care for their young; how comport of an individual affects the structure of a population.	hing animals do, including hich animals interact with and defend resources	ng the underlyin n each other, wit , avoid predators
Course Contents & Topics	animal be mechanis serve? For organism groups; s instance, emphasiz small groubased up behaviour will discus that reprealso illust	se will introduce students to scientific reasoning and chaviour and behavioural ecology. What causes specifims? How does behaviour develop within the individing example; why are some species monogamous while the hunter and another the hunted? Several animal social life is among the most complex and effective so the birth of sterile castes, like in bees, be explained es the reproductive success of as many individuals as ups like squirrels, would an individual risk its own life to on ecological and evolutionary principles, students we all ecology and understand the causes, functions, devise several classical studies that form the foundation of sents the current concepts which have led to modern utrate the links between the recent extraordinary advivith their application in animal conservation.	iic behaviour and what a ual's lifetime and what others are polygamous? species, including humal urvival strategy. Howeve d through an evolving n s possible? Why, among save the rest of the grou will learn to think within elopment, and evolution this field, as well as mor understanding of animal b	re the underlying functions does in What makes on me, tend to live in animals living in me, In this course the paradigm of behaviour. We recent research the paradigm of behaviour. We wisher the well and the me
Course Learning Outcomes	1. Learn to 2. Apprect behaviour 3. Apprect 4. Learn to 5. Think a	o appreciate the causes, functions, development, and estate the complexity of interactions between enviror interactions between enviror is the current theories that form basis for modern unders the scientific reasoning and methodology in the field of analytically in terms of behavioural ecology, animal solding of species' behaviour contributes to its conservation.	evolution of animal behavinmental selective pressi tanding of animal behavion Animal Behaviour. ocio-behavioural comple:	ures and anima
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in B BIOL3301	IOL2306 Ecology and evolution; and pass in one of the Marine biology or BIOL3313 Freshwater ecology or Egy of marine mammals	following courses:	ogy or BIOL332
Offer in 2014 - 2015		sem	Examination	Dec
Offer in 2015 - 2016	N			
Course Grade	A+ to F			
Grade Descriptors	A	Evidence of a thorough grasp of the subject in a broader compareading and excellent use of named examples and case stud excellent use of a broad range of fundamental concepts to draw to learn, great abilities of independent work, effective presents Excellent or outstanding work relative to what is required at degree	ies. Evidence of independent insightful and logical conclusion ation skills with excellent analy	critical thought with

	C D Fail	and very good (but not outstanding) abilities and logical argumentation. Good general of conclusions. Work more than sufficient for what Demonstrate an adequate, but not coherent and limited use of named examples and case and lorindependent; only partial abilities to use conclusions. Fair presentation skills, with motivate concepts. Work sufficient for what is not particularly effective presentation skills with appropriate conclusions. Work barely meets we not particularly effective presentation skills with appropriate conclusions. Work barely meets we not particularly effective presentation skills with appropriate conclusions. Work barely meets we not particularly effective presentation skills with appropriate conclusions.	command of acquired knowledge to draw at is required at degree level.  and incomplete grasp of the subject, with lin se studies. Some abilities of logical critical the seacquired knowledge and work independiostly correct argumentation, but limited (or equired for degree level.  artial and limited to the most basic concepts, ackground reading, limited abilities of critical in the generally weak logical argumentation and reflat is required at degree level.  Individual to the most basic concepts, ackground reading, limited abilities of critical in the generally weak logical argumentation and reflat is required at degree level.  Individual to the subject. No evidence is and case studies. Inadequate evidence of	meaningful and logical nited background reading ninking, but not insightful ently to draw meaningful no) abilities to integrate  examples, and limited (or ndependent thinking, and estricted ability of drawing the of background reading coherent logical thought;
Course Type	Lecture wi	th laboratory component course		
Course Teaching	Activities	<b>)</b>	Details	No. of Hours
& Learning Activities	Lectures			24
	Laboratory		including field trips, site visits, interactive practical/visual sessions, classroom debates	32
	Project work		project work review	8
	Reading / Self study			60
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)
	Assignments		active participation/continuous assessment	55
	Examination			45
Required/recommended reading and online materials	Publishing Danchin E Dugatkin L	Bolhuis J.J. & Giraldeau L.A. The Behavior of Animals: Mechanisms, Function, and Evolution (Blackwe Publishing 2005) Danchin E., Giraldeau L-A. & Cezilly F. Behavioural Ecology (Oxford University Press 2008) Dugatkin L.A. Principles of Animal Behavior (2nd edition) (W.W. Norton & Company 2009) Breed M.D. & Moore J. (eds). Encyclopedia of Animal Behavior (Academic Press 2010)		
Course Website	http://www	.biosch.hku.hk/ecology/lsc		
Additional Course Information		e is offered in alternate year. e will be offered subject to a minimum e	enrollment number and availability of	teachers.

BIOL4401 Medical microb	iology and applied immunology (6 credits)	Academic Year	2014
Offering Department	Biological Sciences	Quota	40
Course Co-ordinator	Dr W Y Lui, Biological Sciences (wylui@hku.hk)		
Teachers Involved	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 microbiology in biological research, clinical analysis and disease		immunology and
Course Contents & Topics	Basic parameters affecting antigen-antibody interactions Application of antigen-antibody interaction in advanced rese immunohistochemistry and dual Immunofluorescence Principles and application of flow cytometry Techniques in cellular immunology and tumor immunology Microbial pathogens and associated diseases, host immune re resistance, epidemiology and prevention of microbial infections Clinical laboratory analyses in serology, haematology, ble pathology	esponse, antimicrobial ago	ents and multidru
Course Learning Outcomes	On successful completion of this course, students should be al 1. Apply the principles of antigen-antibody interaction in variou 2. Demonstrate knowledge on microbial pathogens, mechanis of antibiotic development.  3. Understand the scientific principles of various clinical labora 4. Promote public attention on control of microbial infection and	s advanced research tech ms for their disease-caus tory analyses.	ing, and principle
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in BIOL3403 Immunology		
Offer in 2014 - 2015	Y 2nd sem	Examination	May
Offer in 2015 - 2016	Υ		

Grade Descriptors	A	Demonstrate thorough mastery at an advan learning outcomes. Show strong analytical ar and ability to apply knowledge to a wide ran lab skills and techniques. Critical use of data effective organizational and presentational sk	nd critical abilities and logical thinking, age of complex, familiar and unfamilian and results to draw appropriate and in	with evidence of original thought, r situations. Apply highly effective			
	В	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.					
	С	C Demonstrate general but incomplete command of knowledge required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective lab skills and techniques. Mostly correct but some erroneous use of data and results to draw appropriate conclusions. Apply moderately effective organizational and presentational skills.					
	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 comma Lack of analytical and critical abilities, logical to solve problems. Apply minimally effective and/or unable to draw appropriate conclusi ineffective.	and coherent thinking. Show very little or ineffective lab skills and techniq	e or no ability to apply knowledge ues. Misuse of data and results			
Course Type	Lecture wit	h laboratory component course					
Course Teaching	Activities		Details	No. of Hours			
& Learning Activities	Lectures			24			
	Laboratory			20			
	Tutorials			6			
	Reading /	Self study		100			
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)			
	Assignme	nts	including lab reports	30			
	Examination			70			
Required/recommended reading and online materials	To be anno	ounced in class					
Course Website	http://mood	lle.hku.hk/					
Additional Course Information	This course	e will be offered subject to a minimum	enrollment number and availal	bility of teachers.			

BIOL4402 Microbial biotec	nnology (6 credits)	Academic Year	2014			
Offering Department	Biological Sciences	Quota	30			
Course Co-ordinator	Dr J S H Tsang, Biological Sciences (jshtsang@hku.hk)	Dr J S H Tsang, Biological Sciences <i>(jshtsang@hku.hk)</i>				
Teachers Involved	Dr J S H Tsang, Biological Sciences Dr V Dvornyk, Biological Sciences					
Course Objectives	This course is intended for students who would like to understand the application of modern microbiology in biotechnology. The microbial systems being used include different types of viruses, bacteria, fungi and algae. At the end of the course the students are expected to know the parameters and conditions that affect the yield of production and the systems available for the expression of vaious types of biotechnology products.					
Course Contents & Topics	Upstream and downstream processing will be briefly described to e for microbial biotechnology. The latest advances in microbial expre yeasts and algae will be reviewed. Specific examples on the provided. These include but not limited to production of recombin food and food additives, industrial enzymes and biopesticides as diagnostics.	ssion systems using the use of these systems and vaccines, second	viruses, bacteria, vstems will be lary metabolites,			
Course Learning Outcomes	On successful completion of this course, students should be able to:  1. Explain the fundamental biochemical concepts underlying the ind biotechnology products.  2. Understand the importance of the current recombinant techno various protein products.  3. Describe the major expression systems, understand their purpose 4. Deliver a professional group presentation on a self-decided topic in the standard professional group presentation on a self-decided topic in the standard professional group presentation on a self-decided topic in the standard professional group presentation on a self-decided topic in the standard professional group presentation on a self-decided topic in the standard professional group presentation on a self-decided topic in the standard professional group presentation on a self-decided topic in the standard professional group presentation on a self-decided topic in the standard professional group presentation on a self-decided topic in the standard professional group presentation on a self-decided topic in the standard professional group presentation on a self-decided topic in the standard professional group presentation on a self-decided topic in the standard professional group presentation on a self-decided topic in the standard professional group presentation on the standard professional group professional group professional group g	ustrial production of s ogy for large-scale r s, advantages, and di	nanufacturing of sadvantages.			
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in BIOL3401 Molecular biology					
Offer in 2014 - 2015	Y 2nd sem	Examination	May			
Offer in 2015 - 2016	Υ	-				
Course Grade	A+ to F					
Grade Descriptors	A Demonstrate thorough mastery at an advanced level of extensive kn	owledge and skills required	for attaining all the			

		of appropriate theories, principles, eviden	deep understanding of the subject. Demonstrate noe and techniques. Illustrate insightful use and fingh quality sources and to quote/reference	critical analysis / evaluation			
	В	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining most of the cours learning outcomes. Demonstrate substantial grasp of the subject. Demonstrate general integration of theories principles, evidence and techniques. Illustrate critical use of relevant information from sources, showing ability to make meaningful comparisons between different secondary interpretations and to quote/reference aptly. Appl effective organizational and presentational skills.					
	С	outcomes. Demonstrate general but inc theories, principles, evidence and technic	nowledge and skills required for attaining modern to the subject. Demonstrate ques. Illustrate use of relevant information from interpretations and to quote/reference aptly.	some partial integration of sources, showing ability to			
	D	partial but limited grasp, with retention theories, principles, evidence and techn	s required for attaining some of the course learn of some relevant information, of the subject. niques. Demonstrate use and reference of se and comparison. Apply limited or barely et	Show limited integration of everal sources, but mainly			
	Fail	evidence of little or no grasp of the knowl of theories, principles, evidence and tech	skills required for attaining the course learning the course learning of the subject. Show limited use of secondary sources skills are minimally effective or ineffective.	ttle or no or inapt integration			
Course Type	Lecture-b	pased course					
Course Teaching & Learning Activities	Activitie	98	Details	No. of Hours			
& Learning Activities	Lectures	3		30			
	Tutorials	S	including group presentations	18			
	Reading	/ Self study		100			
Assessment Methods and Weighting	Methods	S	Details	Weighting in final course grade (%)			
	Assignm	nents		30			
	Examina	ation		70			
Required/recommended reading and online materials	Freeman	& Co., 1995)	technology: Fundamentals of Applied then, C. L. Hershberger, W-S. Hu, D.	d Microbiology (W. H.			

<b>BIOL4409 General virolog</b>	y (6 credits)	Academic Year	2014
Offering Department	Biological Sciences	Quota	30
Course Co-ordinator	Dr B L Lim, Biological Sciences (bllim@hku.hk)		
Teachers Involved	Dr B L Lim, Biological Sciences Prof F C C Leung, Biological Sciences		
Course Objectives	This Course provides the fundamental principles of pathogenesis of major viral diseases that affect anir profession or graduate work in virology, medicine and b	nal health. The course will pre	n understand th pare students fo
Course Contents & Topics	Fundamental Virology  1. Classification and Nomenclature of Viruses  2. Virus structure: Capsid symmetry, Icosahedral symm  3. Virus structure: Genetic Materials, Nucleocapsid, Env  4. Virus entry: Receptors, uncoating and fusion  5. Virus-Cell interaction  6. RNA viruses: Genome replication and mRNA product  7. Baltimore Class IV (+) s.s. RNA viruses: Picornavirus  8. Baltimore Class V (-) s.s. RNA viruses: Myxoviruses  9. Ambisense RNA viruses: Bunyaviruses and Arenavir  10, 11. Baltimore Class VI (+) s.s. RNA viruses: Retrovi  12. Baltimore Class II d.s. RNA viruses: Recoviruses  13, 14. Baltimore Class II d.s. DNA viruses: Parvoviruse  15. Baltimore Class II s.s. (+) DNA viruses: Parvoviruse  16. Mechanisms of Viral Oncogenesis  17. Anti-viral treatments  18. Viruses as Tools in Medicine and Biotechnology  Practical Virology  19. Specimen Collection, Transportation and Processing Quality Assurance & Laboratory Safety  20. Virus isolation, propagation and titration  21, 22. Virus Identification: Immunocytochemical assays Complement Fixation Assay, Hemagglutination and HI at 23, 24. Neutralization assay and Antiviral assay	velope  tion ies uses ruses es, Herpesviruses s	
Course Learning Outcomes	On successful completion of this course, students should be familiar with virus classification and the modestamilies.  2. Gain hand-on experiences on common virological tectors.	s of replication and transmissio	n of various vira

	0. 04	out researches on virology after ta	king this course.		
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in B	Pass in BIOL3401 Molecular biology or BIOL3403 Immunology			
Offer in 2014 - 2015	Y 1st	sem	Ex	amination	Dec
Offer in 2015 - 2016	Υ		<u> </u>		
Course Grade	A+ to F				
Grade Descriptors	A	Demonstrate thorough mastery at ar outcomes. Show strong analytical sk subject. Apply highly effective lab skill	ills and competent ability to acquire	knowledge on nev	w development of the
	В	Demonstrate substantial command of the course learning outcomes. Show development of the subject. Apply presentational skills.	evidence of analytical skills and adeq	uate ability to acqu	ire knowledge on new
	С	Demonstrate general but incomplete learning outcomes. Show evidence development of the subject. Apply organizational and presentational skill	of some analytical skills and certain moderately effective lab skills and	n ability to acquire	e knowledge on new
	D Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of limited analytical skills and ability to acquire knowledge on new development of the subject. Apply partially effective lab skills and techniques. Apply limited or barely effective organizational and presentational skills.				
	Fail  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	rith laboratory component course			
Course Teaching	Activitie	s	Details		No. of Hours
Course Teaching & Learning Activities	Activitie Lectures		Details		No. of Hours
		-	Details		
	Lectures	pry	Details		24
	Lectures Laborato Tutorials	pry	Details		24
	Lectures Laborato Tutorials	ory / Self study	Details  Details		24 24 6
& Learning Activities  Assessment Methods	Lectures Laborato Tutorials Reading	/ Self study			24 24 6 100 Weighting in final
& Learning Activities  Assessment Methods	Lectures Laborato Tutorials Reading Methods	/ Self study			24 24 6 100 Weighting in final course grade (%)
& Learning Activities  Assessment Methods	Lectures Laborato Tutorials Reading Methods Assignme Examina Virology: I Principles	/ Self study	Details sis (2010) L. C. Norkin, ASM F		24 24 6 100 Weighting in final course grade (%)
& Learning Activities  Assessment Methods and Weighting  Required/recommended reading	Lectures Laborato Tutorials Reading Methods Assignme Examina Virology: I Principles Basic Viro	ory  / Self study  s ents tion  Molecular Biology and pathogenes of Virology (2009) S.J. Flint, ASN	Details sis (2010) L. C. Norkin, ASM F		24 24 6 100 Weighting in final course grade (%)

<b>BIOL4411 Plant and food</b>	biotechnology (6 credits)	Academic Year	2014
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 TBC, Biological Sciences		
Course Objectives	This course covers the principles and key concepts of p increasing global food supply. The significances of biotechnothe emerging importance of plant biotechnology in m biopharmaceuticals and other high-value proteins will be d insight on the real-life applications of plant and food biotechnology.	ology in agriculture and food colecular farming for the discussed. The course will a	production, an production of
Course Contents & Topics	<ul> <li>Genetic improvements in agriculture. Transgenic crops in global food production.</li> <li>Tools in plant genetic engineering: promoters and marker ge</li> <li>Techniques in plant gene transfer: Agrobacterium-mediated</li> <li>Nuclear and plastid transformation.</li> <li>Gene silencing in plants. Genetic manipulation of commercic Extending shelf-life of fruits. Prevention of enzymatic brown Genetically-engineered biofortified foods: provitamin A-entanthocyanin tomatoes.</li> <li>Biotechnology in plant pest and disease management: Producing crops resistant to phytopathogens and pests. Short-interfering RNAs in gene silencing to defend against pl Protecting crops in the field using the Bt toxin.</li> <li>Pest-resistant genetically-transformed seeds using the alpha</li> <li>Herbicide-resistant crops.</li> <li>Plants as bioreactors for molecular farming: transgenic recombinant biopharmaceutical proteins.</li> <li>Biodegradable plastics. Biofuels.</li> <li>Genetically-modified crops and food products: regulation, tes</li> </ul>	transformation, biolistics and ally useful biosynthetic pathwing of potato tubers. riched rice, omega-3-enriched ant viruses.  -amylase inhibitor  and transplastomic plants	vays in crops.  ed soy and hig

		GM food in North America, Europe ons on the production of plant-derive			
Course Learning Outcomes	On successful completion of this course, students should be able to:				
	<ol> <li>Acquire key concepts in plant and food biotechnology and basic laboratory techniques in pla biotechnology.</li> <li>Gain insight into real-life applications in plant and food biotechnology.</li> <li>Develop scientific inquiry and critical thinking skills.</li> </ol>				hniques in plant
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in BIOL3401 Molecular biology or BIOL3211 Nutrigenomics				
Offer in 2014 - 2015	N			Examination	
Offer in 2015 - 2016	Υ				
Course Grade	A+ to F				
Grade Descriptors	A	A Demonstrate thorough and complete mastery of extensive knowledge and skills required for attaining the learning outcomes in Plant and Food Biotechnology. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations in plant biotechnology. Apply highly effective organizational and presentational skills.			
	В	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes in plant biotechnology. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.			
	С	Demonstrate general but 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. Show 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. Some evidence of coherent and logical thinking, accompanied with limited analytical and critical skills. Show limited ability to apply knowledge in plant biotechnology. Show limited or barely effective organizational and presentational skills.				
	Fail	Fail to demonstrate command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. No evidence in ability to apply knowledge in plant biotechnology. Ineffective organizational and presentational skills.			
Course Type	Lecture wi	th laboratory component course			
Course Teaching	Activities	3	Details		No. of Hours
& Learning Activities	Lectures				24
	Laborator	у	practical/laboratory/p	project	30
	Reading / Self study				100
Assessment Methods and Weighting	Methods		Details		leighting in final ourse grade (%)
	Examinat	ion			70
	Laboratory reports				10
	Presentation			20	
Required/recommended reading and online materials	Chrispeels, M.J. and D.E. Sadava. Plants, genes, and agriculture. Jones and Bartlett.  E-reserves (HKU Library) Lecture notes on Moodle				
Course Website	http://moo	dle.hku.hk/			
Additional Course Information	An advanc	olecular Biology & Biotechnology M red elective course in FNS Major red elective course in Plant Science			

BIOL4415 Healthcare biotechnology (6 credits)		Academic Year	2014	
Offering Department	Biological 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	This course discusses the key concepts and principles involved in healthcare biotechnology, and their applications in molecular medicine.			
Course Contents & Topics	Genetic biotechnology in animals (transgenics, knockouts and other related technologies): Transgenic animals as models in the study of human diseases, as bioreactors for the production of hormones, antibiotics and vaccines and organs for xenotransplantation.  Advanced molecular biology techniques related to human and animal science basic research, disease diagnosis and development of new therapies. These include but not limited to: applications of DNA technologies in diagnostic medicine and forensic science; tissue engineering.  An overview of the drug development process, with a focus on the early-stage, preclinical drug discovery, drug target identification, high-throughput assay development, and screening of chemical libraries (synthetic and natural products). The concept of individualized medicine will also be discussed.			
Course Learning Outcomes	On successful completion of this course, students should be able	e to:		
	1. Describe key concepts in genetic biotechnology and human health.			
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	<ol> <li>Acquire and apply advanced laboratory techniques essential to biotechnology.</li> <li>Develop scientific inquiry and critical thinking skills to understand, analyze, and evaluate problems order to develop solutions.</li> <li>Gain insight into real-world applications in healthcare biotechnology.</li> </ol>				
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in BIOL3401 Molecular biology				
Offer in 2014 - 2015	Y 2n	Y 2nd sem Examination Mag			
Offer in 2015 - 2016	Υ	Υ			
Course Grade	A+ to F	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 organizational skills. Writings consistently demonstrate informed, thoughtful intellectual engagement with broad range of relevant concepts.				
	В	B Demonstrate substantial command of a broad range of knowledge required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational skills. Writings mostly demonstrate informed, thoughtful intellectual engagement with broad range of relevant concepts.			
	С	Demonstrate general but incomplete command of knowledge required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational skills. Writings mostly indicate informed, intellectual engagement with concepts or theories but not always with sufficient depth, breadth or understanding.			
	D	Demonstrate partial but limited command of knowledge required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational skills. Writings indicate some intellectual engagement with concepts or theories but mostly at a superficial level.			
	Fail  Demonstrate little or no evidence of command of knowledge required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organizational skills are minimally effective or ineffective. Writings reveal an absence of intellectual engagement with concepts or theories. Writings are irrelevant or superficial.				
Course Type	Lecture v	Lecture with laboratory component course			
Course Teaching	Activitie	es	Details	No. of Hours	
& Learning Activities	Lectures			24	
	Laboratory			24	
	Tutorials			24	
	Tutorials	5	tutorials/assignments/computer sessions		
		s y / Self study		6	
		g / Self study		6 100 Weighting in final	
	Reading	y / Self study	sessions	6 100 Weighting in final course grade (%)	
	Reading	g / Self study s nents	Sessions Details	Weighting in final course grade (%)	
	Method Assignm Examina	g / Self study s nents	Sessions Details	Weighting in final course grade (%)	
	Method Assignm Examina	g / Self study s nents ation	Sessions Details	Weighting in final course grade (%)	
Assessment Methods and Weighting  Required/recommended reading and online materials	Reading  Method  Assignm Examina Laborate Test  Textboo 2002) - Human	y / Self study  s nents ation ory reports	Details  Assignment/Discussion  (Krogsgaard-Larsen, Liljefors, and MacRead, Garland Science, 2010)	Weighting in final course grade (%)  10  60  20	
and Weighting  Required/recommended reading	Reading  Method  Assignm  Examina  Laborate  Test  Textboo  2002)  Human  Sugges	s nents ation ory reports ok of Drug Design and Discovery	Details  Assignment/Discussion  (Krogsgaard-Larsen, Liljefors, and MacRead, Garland Science, 2010)	Weighting in final course grade (%)  10  60  20	

BIOL4416 Stem cells and	regenerative biology (6 credits)	Academic Year	2014	
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	Recent progress in high-throughput omics technology has revolutionized the biological research. Genome-wide profiling of various biomolecules simultaneously by omics technology generates huge amounts of data, providing the potential to obtain a global and holistic view of the system. This course aims to introduce the state-of-the-art technologies of Omics and Systems Biology, and overview of various applications of omics technology in agricultural, biomedical, environmental, and nutritional sciences. This course will also provide students hands-on experience in large scale data analysis.			
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 different embryonic and adult stem cells - experimental inducible pluripotent stem cells and tissue engineering therapeutics potentials for stem cell technology - ethical issues in stem cell research			
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Course Learning Outcomes	- model sys - cellular ar - telomeres - genomic s - mitochono - genetic ac - genetic ac - genetic be On success 1. Apprecia 2. Describe	and longevity: stems used for aging and life-span stu- nd molecular biology of aging s and cellular senescence stability, DNA mutations and repair drial defects and oxidative stress ging diseases iochemical and metabolic pathways in sful completion of this course, students ate the complex regulations of cell pote et the characteristics of stem cells and it	avolved in longevity s should be able to: ency, cell age and orgathe different types of s	tem cells.	
Pre-requisites	<ul> <li>3. Describe applications of stem cell research, and understand ethical concerns involved.</li> <li>4. Describe the cellular mechanisms of aging, and the pathways involved in longevity.</li> <li>Pass in BIOL3211 Nutrigenomics or BIOL3401 Molecular biology or BIOL3402 Cell biology and cell</li> </ul>				
(and Co-requisites and Impermissible combination)	technology or BIOL3403 Immunology or BIOL3404 Protein structure and function or BIOL3408 Genetics of BIOC3601 Metabolism or BIOC3604 Essential techniques in biochemistry and molecular biology.				L3408 Genetics or
Offer in 2014 - 2015	Y 2nd	Y 2nd sem Examination May			May
Offer in 2015 - 2016	N		'		
Course Grade	A+ to F				
Grade Descriptors	Demonstrate thorough and complete 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. 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. 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. 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	sed course			
Course Teaching	Activities		Details		No. of Hours
& Learning Activities	Lectures				36
	Tutorials				12
	Reading / Self study			100	
Assessment Methods and Weighting	Methods		Details		Veighting in final course grade (%)
	Assignments				50
	Examination				50
Required/recommended reading and online materials	edited by R	of stem cell biology Robert Paul Lanza 2009		<u>'</u>	
	Science in medicine: the JCI textbook of molecular medicine By Andrew R. Marks, American Society for Clinical Investigation, Ushma S. Neill				
	Molecular biology of aging, Issue 51 By Leonard Guarente, Linda Partridge, Douglas C. Wallace - 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.				

BIOL4417 'Omics' and s	ystems biology (6 credits)	Academic Year	2014	
Offering Department	Biological Sciences	Quota	40	
Course Co-ordinator	Dr J W Zhang, Biological Sciences (jzhang1@hku.hk)			
Teachers Involved	Dr J W Zhang, Biological Sciences			
Course Objectives	wide profiling of various biomolecules simultaneously by omics data, providing the potential to obtain a global and holistic vi introduce the state-of-the-art technologies of Omics and Sys applications of omics technology in agricultural, biomedical, env	Recent progress in high-throughput omics technology has revolutionized the biological research. Genome wide profiling of various biomolecules simultaneously by omics technology generates huge amounts of data, providing the potential to obtain a global and holistic view of the system. This course aims to introduce the state-of-the-art technologies of Omics and Systems Biology, and overview of various applications of omics technology in agricultural, biomedical, environmental, and nutritional sciences. This course will also provide students hands-on experience in large scale data analysis.		
Course Contents & Topics	This course will introduce the concept of 'Omics' study in bio comprehensively study a biological entity ('-ome' e.g. all genes tissue, a cell or an environment. The course will discuss larg	transcripts, proteins) i	n an organism, a	

	bioinformatic analyses and applications involved in: Genomics - the study of all genes or DNA sequences in a genome Transcriptomics - the study of all mRNA transcripts Proteomics - the study of all proteins Interactomes - the study of all genetic or physical interactions among genes or proteins Systems biology and functional genomics - the study of the interactome/network between componential biological system, and modeling to discover the integrated function and emergent properties of that segmentic materials found in an environment) and metabolomics (metabolites & intermediates involve biological reaction).]  On successful completion of this course, students should be able to:				
Course Learning Outcomes	On successful completion of this course, students should be able to:  1. Explain the conceptual differences between 'Omics'/Systems Biology studies and traditional one-gene approach, and discuss the pros and cons of both approaches. 2. Describe common methodologies used in major 'Omics' studies. 3. Describe basic analytical methods, and access database resources generated in major 'Omics' studies. 4. Describe how 'Omics' data are used in Systems Biology to understand the integrated functions of the system. 5. Identify questions that can be addressed by 'Omics' and System Biology studies, appreciate and describe applications in 'Omics' studies.				
Pre-requisites (and Co-requisites and Impermissible combination)	technology	OL3211 Nutrigenomics or BIOL340 or BIOL3403 Immunology or BIOL340 Metabolism or BIOC3604 Essential te	04 Protein structure and funct	ion or BIOL	3408 Genetics or
Offer in 2014 - 2015	Y 2nd	sem	Examir	nation	May
Offer in 2015 - 2016	Υ	1.0			
Course Grade	A+ to F				
Grade Descriptors	A Demonstrate thorough and complete mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong 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. 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. 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. 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 comma outcomes. Lack of analytical and critical abili knowledge to solve problems. Organization a	ties, logical and coherent thinking. Sl	now very little	or no ability to apply
Course Type	Lecture wit	h laboratory component course			
Course Teaching	Activities		Details		No. of Hours
& Learning Activities	Lectures				24
	Laboratory	I			24
	Reading /	Self study			100
Assessment Methods and Weighting	Methods		Details		eighting in final ourse grade (%)
	Assignme		course assignments/projects/quizze	es	40
	Examination	on			60
Required/recommended reading and online materials	ТВА				
Course Website	http://mood	le.hku.hk/			
Additional Course Information	This course	e will be offered subject to a minimum	enrollment number and availa	ability of tea	chers.
	The decise will be chered despect to a minimum emornion humber and availability of teachers.				

BIOL4501 Molecular ph	ylogenetics and evolution (6 credits)	Academic Year	2014		
Offering Department	Biological Sciences Quota				
Course Co-ordinator	Dr V Dvornyk, Biological Sciences (dvornyk@hkucc.hku.hk)				
Teachers Involved	Dr V Dvornyk, Biological Sciences				
Course Objectives	The purpose of this course is to provide a comprehensive systematics and phylogenetic research, focusing on in depth of treatment of theoretical issues in formal lectures is coupled with presearch acquisition of the sequences from the databases.  DNA and protein sequence assembly and alignment phylogeny reconstruction using parsimony, distance based, and introduction to relevant software for phylogenetics.	overage of the latest to actical workshops.	echniques. The		
	240				

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		s for the evaluation of phylogene trees				
Course Contents & Topics	Introduction to molecular systematics and phylogenetics. Tree of life. Obtaining, storing and archiving specimens and tissue samples for use in molecular studies. Sources of molecular data, experimenta design for molecular studies, taxon sampling and marker choice. Overview of basic laboratory methods fo data collection (DNA isolation, PCR, DNA sequencing). Sequence editing and aligning; utilizing public sequence databases. Estimation of nucleotide polymorphism and diversity. Methods for phylogeny reconstruction: parsimony, distance methods, maximum likelihood, Bayesian methods. Statistical methods for the evaluation of phylogenetic trees. Software for phylogeny reconstruction. Molecular markers in conservation and ecological genetics. Phylogenies for different organisms. Biogeography vs. phylogeography using molecular data.					
Course Learning Outcomes	On succe	ssful completion of this course, student	ts should be able to:			
	<ol> <li>Understand the fundamental principles of molecular phylogenetics.</li> <li>Understand the purposes each method is used for and be able to choose the most appropriate metho (s) for the analysis of given data.</li> <li>Understand the advantages and disadvantages of the methods.</li> <li>Acquire practical skills for the analysis of molecular data.</li> </ol>					
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in B	IOL3401 Molecular biology or BIOL340	08 Genetics			
Offer in 2014 - 2015	N			Examination		
Offer in 2015 - 2016	Υ					
Course Grade	A+ to F					
Grade Descriptors	A 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, systematize, analyze and critically evaluate data from various sources and to quote them appropriately. Good presentational skills.					
	С	Demonstrate basic knowledge and basic level of skills sufficient for accomplishing most of the goals and expected learning outcomes of the course. Demonstrate general understanding of the subject. Show some ability to combine and to apply theories, principles and methods taught in the course. Basic skills in possession and application of the methods and software for molecular evolutionary analysis of real data. Show general ability to collect, systematize, analyze and evaluate data from various sources and to quote them appropriately. Basic presentational skills.				
	D	Demonstrate incomplete knowledge and weak skills sufficient for accomplishing only some of the goals and expected learning outcomes of the course. Demonstrate poor understanding of the subject, Show poor ability to combine and to apply theories, principles, and methods taught in the course. Limited skills in possession and application of the methods and software for molecular evolutionary analysis of real data. Show poor ability to collect data from various sources, to systematize, analyze and evaluate them appropriately. Poor presentational skills.				
	Fail	Demonstrate poor or no knowledge and skills of the course. Demonstrate very poor or no utheories, principles, and methods taught in thand software for molecular evolutionary anal sources and to systematize, analyze and eva	understanding of the subject. ne course. Poor or no skills in lysis of real data. Show very	. Show no ability to co n possession and appli poor or no ability to co	mbine and/or to apply cation of the methods collect data from other	
Course Type	Lecture w	ith laboratory component course				
Course Teaching	Activitie	s	Details		No. of Hours	
& Learning Activities	Lectures				24	
	Laborato	ry	computer laboratory/tutorial/pr	rojects	36	
	Reading	/ Self study			100	
Assessment Methods and Weighting	Methods	•	Details		Veighting in final course grade (%)	
	Assignm	ents			40	
	Examina	tion			60	
Required/recommended reading	Nei M., Kumar S.: Molecular Evolution and Phylogenetics (Oxford University Press, 2000) Hall B.G.: Phylogenetic Trees Made Easy (Sinauer, 2004, 2nd ed.)					
and online materials	TBC					
	-	odle.hku.hk/				

BIOL4861 Ecology & bio	Academic Year	2014		
Offering Department	Biological Sciences Quota			
Course Co-ordinator	Dr T Vengatesen, Biological Sciences (rajan@hku.hk)			
Teachers Involved	All SBS academic staff, Biological Sciences			
Course Objectives	To provide a stimulating experience for all Ecology & Biodiversity Major undergraduates to integrate and apply their knowledge and skills obtained from the Ecology & Biodiversity Major through gaining work experience in the field of Ecology & Biodiversity that are related to the major of study.			

Course Contents & Topics	Students taking this course will work as an intern for at least 160 hours within the University or outside the University in a company, government department or NGO. The internship may be arranged by the School or obtained by students themselves. In the latter case, the internship must be in a relevant field to the Ecology & Biodiversity Major that the students are taking and prior approval by the course coordinator is required.					
Course Learning Outcomes	1. gain first 2. apply the 3. acquire	On successful completion of this course, students should be able to:  1. gain first hand work experience in a job placement related to their Ecology & Biodiversity Major.  2. apply the knowledge in their Ecology & Biodiversity Major in solving practical problems in the work place.  3. acquire an understanding and appreciation of the real work environment.  4. extend their network in their field of study.				
Pre-requisites (and Co-requisites and Impermissible combination)		Students are expected to have satisfactorily completed their Year 3 study. This course is for Ecology & Biodiversity Major students only.				
Offer in 2014 - 2015	Y 2nd	2nd sem Summer Examination No Exam				
Offer in 2015 - 2016	Υ					
Course Grade	Pass/Fail					
Grade Descriptors	Pass	Able to apply knowledge to solve problems in the job or assigned by supervisor(s). Estal colleagues, and clients in the job. Successfu working hours, written and oral report, and eva	blishes effective collaboration illy fulfills the requirements se	and communication	on with supervisor(s),	
	Fail	Very limited or no ability to solve problems in assigned by supervisor(s). Fails to establis colleagues, or clients in the job. Fails to satis hours, written and oral report, or evaluation by	sh effective collaboration or fy the requirements set out in	communication with	supervisor(s), other	
Course Type	Internship					
Course Teaching	Activities		Details		No. of Hours	
& Learning Activities	Internship	it is expected that students are to work at least 160 hours (or the equivalent of 4 weeks full-time)				
Assessment Methods and Weighting	Methods		Details		Weighting in final course grade (%)	
	Written re	port	written report, e feedback and oral pro	employer's esentation	100	
Course Website	http://www.	biosch.hku.hk/ecology/lsc/				
Additional Course Information	internships offering the Students a those who Enrolment through the	http://www.biosch.hku.hk/ecology/lsc/ Students taking this course have to submit a two-page written report and an oral presentation about their internships, which will be assessed by internal supervisors. Student's supervisor at work i.e. the institution offering the internship will also submit an assessment report to the University. Students are expected to have satisfactorily completed their Year 3 study. Special consideration be given to those who have completed Year 2. Enrolment of this course is not conducted via the online course selection system and should be made through the relevant Department/School office after approval has been obtained from the course coordinator. BIOL4861 Ecology & biodiversity internship is not a Capstone Course.				

<b>BIOL4911 Conservation so</b>	cience in practice (6 credits)	Academic Year	2014		
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	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 principl and concepts learned to produce and successfully debate a topic in conservation science. Case studies verifically 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, pouncertainty. Possible case studies range from ecosystem services, be assessment of conservation risk, effectiveness of international conse and the relationship between biodiversity and human livelihoods. Tutor provided to discuss specific issues of relevance across case studies.	conservation scient olitical consideration piological footprints, rvation and biodive	ce in the modern is and scientific wildlife trade, to rsity instruments		
Course Learning Outcomes	On successful completion of the course, students should be able to:  1. Have an in-depth understanding of the topic studied, the major is prospects for further work in the area;  2. Have developed investigative skills associated with the case studing organization and presentation of information;  3. Understand the importance and complexities of conserving biodiversi 4. Be able to identify practical and scientifically defensible initiatic conservation intervention;  5. Be able to competently present the case study and convincingly argues.	ly selected which in ity; ives and measures	nclude synthesis		
	3. Be able to competently present the case study and convincingly argu	e their case.			

(and Co-requisites and Impermissible combination)	BIOL4XX This caps	BIOL4XXX) in the Ecology & Biodiversity Major including BIOL3303 Conservation ecology. This capstone course is for Ecology & Biodiversity Major students only.				
Offer in 2014 - 2015	Y 2n	d sem	Examination	May		
Offer in 2015 - 2016	Υ		'			
Course Grade	A+ to F	A+ to F				
Grade Descriptors	A	learning outcomes. Show strong analytical an integrate and synthesize information across apply knowledge to a wide range of complex, and political dimensions for addressing consu	d level of extensive knowledge and skills required critical abilities and logical thinking, with strusting subject areas, including from practical work ufamiliar and unfamiliar situations and showing ervation challenges. Apply highly effective preective thinking and consideration of the wide	ong evidence of ability to ndertaken, and ability to consideration of practical sentational skills. Strong		
	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.				
	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.					
	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	outcomes. Lack of analytical and critical abilities	nd of knowledge and skills required for attair es, logical and coherent thinking or attention to ninking to solve problems. Organization and	detail. Show very little or		
Course Type	Project-b	ased course				
Course Teaching	Activitie	9S	Details	No. of Hours		
& Learning Activities	Reading / Self study		supervised practical work of at least 80 hours followed by written & oral reports. Tutorials provided by course coordinator	80		
Assessment Methods and Weighting	Method	s	Details	Weighting in final course grade (%)		
	Oral pre	sentation		40		
	Researc	h report	project report	60		
Course Website	http://ww	w.biosch.hku.hk/ecology/lsc/				
Additional Course Information	This cour	rse will be offered subject to a minimum e	enrollment number and availability of to	eachers.		

BIOL4962 Food & nutrition	onal science internship (6 credits)	Academic Year	2014			
Offering Department	Biological Sciences	Quota				
Course Co-ordinator	Dr J C Y Lee, Biological Sciences (jettylee@hku.hk)					
Teachers Involved	III SBS academic staff, Biological Sciences					
Course Objectives	Fo provide a stimulating capstone experience for all Food & Nutritional Science Major undergraduates to ntegrate and apply their knowledge and skills obtained from the Food & Nutritional Science Major through gaining work 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 University in a company, government department or NGO. The intobtained by students themselves. In the latter case, the internship Nutritional Science Major that the students are taking and prior required.	ernship may be arrang must be in a relevant	ed by the School o field to the Food 8			
Course Learning Outcomes	On successful completion of this course, students should be able to the superior of the superi	ir Food & Nutritional So in solving practical pro				
Pre-requisites (and Co-requisites and Impermissible combination)	<ol> <li>gain first hand work experience in a job placement related to the</li> <li>apply the knowledge in their Food &amp; Nutritional Science Major place.</li> <li>acquire an understanding and appreciation of the real work envi</li> </ol>	ir Food & Nutritional So in solving practical pro- conment. ourses courses (BIOL3.	oblems in the work			
Pre-requisites (and Co-requisites and	gain first hand work experience in a job placement related to the apply the knowledge in their Food & Nutritional Science Major place.     acquire an understanding and appreciation of the real work envi extend their network in their field of study.  Pass in at least 24 credits of advanced level biological sciences of in the Food & Nutritional Science Major.  Students are expected to have satisfactorily completed their Year 3.	ir Food & Nutritional So in solving practical pro- conment. ourses courses (BIOL3.	oblems in the work			
Pre-requisites (and Co-requisites and Impermissible combination)	gain first hand work experience in a job placement related to the 2. apply the knowledge in their Food & Nutritional Science Major place.     acquire an understanding and appreciation of the real work envi 4. extend their network in their field of study.  Pass in at least 24 credits of advanced level biological sciences of in the Food & Nutritional Science Major.  Students are expected to have satisfactorily completed their Year 3. This capstone course is for Food & Nutritional Science Major students.	ir Food & Nutritional So in solving practical pro- conment.  ourses courses (BIOL3. 8 study. ints only.	oblems in the work			

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 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				
	Fail					
Course Type	Internship	Internship				
Course Teaching	Activities		Details	No. of Hours		
& Learning Activities	it is expected that students are to work at least 160 hours (or the equivalent of 4 weeks full-time)					
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)		
	Written report, employer's feedback and oral presentation					
Course Website	http://wwv	v.biosch.hku.hk/ecology/lsc/				
Additional Course Information	presentati superviso the Unive Students those who Satisfacto internship Distinction obtain the Enrolmen	http://www.biosch.hku.hk/ecology/lsc/  Students taking this course have to submit a written report of not less than 1,000 words and an oral presentation about their internships, which will be assessed by internal supervisors. Student's supervisor at work i.e. the institution offering the internship will also submit an assessment report to the University.  Students are expected to have satisfactorily completed their Year 3 study. Special consideration be given those who have completed Year 2.  Satisfactory completion of this course can be counted towards the Capstone requirement. Details internship will be recorded on the student's transcript. This course will be assessed on "Pass, Fail an Distinction" basis. Students who are interested to enrol in this course should contact the Department obtain the approval.  Enrolment of this course is not conducted via the online course selection system and should be marthrough the relevant Department/School office after approval has been obtained from the course coordinater.				

	gy & biote	chnology internship (6 credits)		Academic Year	2014	
Offering Department	Biological S	Sciences		Quota		
Course Co-ordinator	Dr T Venga	Or T Vengatesen, Biological Sciences (rajan@hku.hk)				
Teachers Involved	All SBS ac	All SBS academic staff, Biological Sciences				
Course Objectives	undergradu Biotechnol	To provide a stimulating capstone experience for all Molecular Biology & Biotechnology Major undergraduates to integrate and apply their knowledge and skills obtained from the Molecular Biology & Biotechnology Major through gaining work experience in the field of Molecular Biology & Biotechnology that are related to the major of study.				
Course Contents & Topics	University obtained by Molecular	Students taking this course will work as an intern for at least 160 hours within the University or outside the University in a company, government department or NGO. The internship may be arranged by the School or obtained by students themselves. In the latter case, the internship must be in a relevant field to the Molecular Biology & Biotechnology Major that the students are taking and prior approval by the course coordinator is required.				
Course Learning Outcomes	<ol> <li>gain firs</li> <li>Major.</li> <li>apply the work place</li> <li>acquire</li> </ol>	sful completion of this course, students should than work experience in a job placement be knowledge in their Molecular Biology & Biotan understanding and appreciation of the real heir network in their field of study.	related to their	or in solving praction		
Pre-requisites (and Co-requisites and Impermissible combination)	Molecular I Students a	least 24 credits of advanced level biological Biology & Biotechnology Major. re expected to have satisfactorily completed to one course is for Molecular Biology & Biotech	heir Year 3 stud	ly.	BIOL4XXX) in the	
Offer in 2014 - 2015	Y 2nd	sem Summer		Examination	No Exam	
	Y 2nd Y	sem Summer		Examination	No Exam	
Offer in 2015 - 2016		sem Summer		Examination	No Exam	
Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade Grade Descriptors	Υ	Able to apply knowledge to solve problems in the work the job or assigned by supervisor(s). Establishes colleagues, and clients in the job. Successfully fulfills working hours, written and oral report, and evaluate performance in the above would be awarded a grade or	effective collaborates the requirements ation by supervisor	r handles and carries o ion and communicatic set out in the Course	ut the work required in in with supervisor(s), Description regarding	
Offer in 2015 - 2016 Course Grade	Y Pass/Fail	Able to apply knowledge to solve problems in the work the job or assigned by supervisor(s). Establishes colleagues, and clients in the job. Successfully fulfills working hours, written and oral report, and evalue	effective collaborates the requirements atton by supervisor of "Distinction".  place. Fails to hand ive collaboration of equirements set out	r handles and carries o ion and communicatic set out in the Course (s), etc. Students de dle or carry out the wor or communication with	ut the work required in in with supervisor(s), Description regarding monstrating excellent k required in the job or supervisor(s), other	
Offer in 2015 - 2016 Course Grade	Y Pass/Fail Pass	Able to apply knowledge to solve problems in the work the job or assigned by supervisor(s). Establishes colleagues, and clients in the job. Successfully fulfills working hours, written and oral report, and evalue performance in the above would be awarded a grade of Very limited or no ability to solve problems in the work assigned by supervisor(s). Fails to establish effect colleagues, or clients in the job. Fails to satisfy the re	effective collaborates the requirements atton by supervisor of "Distinction".  place. Fails to hand ive collaboration of equirements set out	r handles and carries o ion and communicatic set out in the Course (s), etc. Students de dle or carry out the wor or communication with	ut the work required in in with supervisor(s), Description regarding monstrating excellent k required in the job or supervisor(s), other	

	Internship work	it is expected that students are to work at least 160 hours (or the equivalent of 4 weeks full-time)	
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)
	Written report	written report, employer's feedback and oral presentation	100
Course Website	http://www.biosch.hku.hk/ecology/lsc/		
Additional Course Information	Students taking this course have to submit a presentation about their internships, which is supervisor at work i.e. the institution offering the University.  Students are expected to have satisfactorily those who have completed Year 2.  Satisfactory completion of this course ca internship will be recorded on the student Distinction" basis. Students who are interesting obtain the approval.  Enrolment of this course is not conducted through the relevant Department/School coordinator.	vill be assessed by internal supervisors. So the internship will also submit an assess completed their Year 3 study. Special on the counted towards the Capstone restranscript. This course will be assessivated to enrol in this course should contribute to the course should contribute to	Student's ment report to consideration be given to equirement. Details of sed on "Pass, Fail and tact the Department to a and should be made

BIOL4964 Biological scien	nces intern	ship (6 credits)		Academic Year	2014	
Offering Department	Biological S	Sciences		Quota		
Course Co-ordinator	Dr T Venga	itesen, Biological Sciences <i>(rajan</i> @	hku.hk)			
Teachers Involved	All SBS aca	ademic staff, Biological Sciences				
Course Objectives	and apply	a stimulating capstone experience their knowledge and skills obtaine in the field of Biological Sciences the	d from the Biological S	Sciences Major thre		
Course Contents & Topics	University i obtained b	Students taking this course will work as an intern for at least 160 hours within the University or outside the University in a company, government department or NGO. The internship may be arranged by the School or obtained by students themselves. In the latter case, the internship must be in a relevant field to the Biological Sciences major that the students are taking and prior approval by the course coordinator is equired				
Course Learning Outcomes	1. gain first 2. apply the 3. acquire a	sful completion of this course, stude hand work experience in a job place knowledge in their Biological Scier an understanding and appreciation on heir network in their field of study.	ement related to their Bi nces Major in solving pra	ctical problems in t		
Pre-requisites (and Co-requisites and Impermissible combination)	Biological S Students a	Pass in at least 24 credits of advanced level biological sciences courses (BIOL3XXX or BIOL4XXX) in t Biological Sciences Major. Students are expected to have satisfactorily completed their Year 3 study. This captsone course is for Biological Sciences Major students only.				
Offer in 2014 - 2015	Y 2nd	sem Summer		Examination	No Exam	
Offer in 2015 - 2016	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	Very limited or no ability to solve problems assigned by supervisor(s). Fails to esta colleagues, or clients in the job. Fails to s hours, written and oral report, or evaluation	ablish effective collaboration atisfy the requirements set ou	or communication with	n 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 final course grade (%)	
	Written rep	port	written report, feedback and oral	employer's presentation	100	
Course Website	http://www.	biosch.hku.hk/ecology/lsc/				
Additional Course Information	presentatio	king this course have to submit a w n about their internships, which will at work i.e. the institution offering th	be assessed by internal	supervisors. Stude	ent's	

Students are expected to have satisfactorily completed their Year 3 study. Special consideration be given to those who have completed Year 2.

Satisfactory completion of this course can be counted towards the Capstone requirement. Details of internship will be recorded on the student's transcript. This course will be assessed on "Pass, Fail and Distinction" basis. Students who are interested to enrol in this course should contact the Department to obtain the approval.

Enrolment of this course is not conducted via the online course selection system and should be made through the relevant Department/School office after approval has been obtained from the course coordinator.

BIOL4991 Ecology & biod		• • •			
Offering Department	Biological	Sciences	Quota	30	
Course Co-ordinator	Prof G A	Williams, Biological Sciences (hrs	bwga @hku.hk)		
Teachers Involved	All acade	mic staff, Biological Sciences			
Course Objectives	and apply	To provide a stimulating capstone experience for Ecology & Biodiversity Major undergraduates to integrate and apply their knowledge and skills obtained from the Ecology & Biodiversity Major through planning and carrying out a research project under the supervision of a member of staff.			
Course Contents & Topics	admissior	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	1. critique 2. use this 3. develop 4. design 5. analyse 6. presen 7. draw a 8. highligl 9. submit	On successful completion of this course, students should be able to:  1. critique and review appropriate scientific literature. 2. use this information to generate a scientifically relevant research question. 3. develop and formulate scientific hypotheses to test this question. 4. design and undertake practical research work to formally test the hypotheses proposed. 5. analyse and evaluate the data collected to test the hypotheses. 6. present data in a professional manner to illustrate the outcomes. 7. draw an objective series of conclusions based on the experimental work. 8. highlight and discuss their research findings and place them into a holistic scientific context. 9. submit their work following a specified journal format. 10. present their work as a scientific conference talk.			
Pre-requisites (and Co-requisites and Impermissible combination)	Ecology & Cumulativ Students	Pass in at least 24 credits of advanced level 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.			
Offer in 2014 - 2015	N		Examination	on	
Offer in 2015 - 2016	Υ			'	
Course Grade	A+ to F				
Grade Descriptors	Evidence of complete or near-complete understanding and a thorough grasp of the subject matter as demonstrated by attainment of all learning outcomes. Excellent critique and knowledge of relevant literature and identification of research hypothesis. Well designed experimental approach to test research hypothesis. Show excellent organizational and/or analytical skills and laboratory/fieldwork techniques. Demonstrate comprehensive, critical, assessment of results and professional presentation of research work.  B Evidence of near-complete understanding and a good grasp of the subject matter as demonstrated by attainment of the majority of learning outcomes. Good critique and knowledge of relevant literature and identification of research hypothesis. Appropriately designed experimental approach to test research hypothesis. Show good organizational and/or analytical skills and laboratory/fieldwork techniques. Demonstrate effective, critical, assessment of results and				
	good presentation of research work.  C Evidence of adequate understanding and grasp of the subject matter as demonstrated by general but incomplete attainment of most of the learning outcomes. Acceptable critique and knowledge of relevant literature and identification of research hypothesis. Adequately designed experimental approach to test research hypothesis. Show fair organizational and/or analytical skills and laboratory/fieldwork techniques. Demonstrate adequate but not necessarily critical, assessment of results and presentation of research work.  D Evidence of limited understanding and grasp of the subject matter as demonstrated by incomplete attainment of many				
	by Evidence of infinited indirect and interest of the subject matter as deministrated by introduced by introduced and the subject matter as deministrated by introduced by				
	Fail	are not attained. Poor critique and ke designed experimental approach to te	standing and grasp of the subject matter such that mowledge of relevant literature and identification of st research hypothesis. Show little evidence of approork techniques. Demonstrate incorrect interpretation k.	research hypothesis. Badly opriate organizational and/or	
Course Type	Project-ba	ased course			
Course Teaching	Activitie	S	Details	No. of Hours	
& Learning Activities		/ Self study	formal lectures, seminars & practical work	144	
Assessment Methods and Weighting	Methods	3	Details	Weighting in fina course grade (%	
	Dissertat	tion		80	
	Oral pres	sentation	research seminar	20	
		http://www.biosch.hku.hk/ecology/lsc/			

A dissertation of about 9,000 - 12,000 words (80% weighting) should be submitted by April 15th and a research seminar (20% weighting).

BIOL4992 Food & nutriti Offering Department		Il Sciences		Quota	30	
Course Co-ordinator	-	Williams, Biological Science	e (hrehwaa@hku hk)	Quota	30	
Teachers Involved		emic staff, Biological Science	, ,			
Course Objectives			experience for Food & Nutrition	al Science Major u	ndergraduates to	
Course Objectives	integrate	egrate and apply their knowledge and skills obtained from the Food & Nutritional Science Major through inning and carrying out a research project under the supervision of a member of staff.				
Course Contents & Topics	admissio	udents should seek approval from a prospective supervisor prior to selecting this course. After mission to the course is approved by the course coordinator, students will complete their project rk under the guidance of their supervisor.				
Course Learning Outcomes	On succe	essful completion of this cour	se, students should be able to:			
Pre-requisites	2. use th 3. develo 4. design 5. analys 6. preser 7. draw a 8. highlig 9. submit 10. prese	op and formulate scientific hyp and undertake practical rese ee and evaluate the data colle th data in a professional manu an objective series of conclus that and discuss their research their work following a specifient their work as a scientific cat least 24 credits of advance	scientifically relevant research que potheses to test this question. earch work to formally test the hypoted to test the hypotheses. ener to illustrate the outcomes. ions based on the experimental was findings and place them into a heied journal format. conference talk.	ootheses proposed. rork. polistic scientific cont		
(and Co-requisites and Impermissible combination)	Cumulati	Food & Nutritional Science Major; and Cumulative GPA of 3.0 or above. This capstone course is for Food & Nutritional Science Major students only.				
Offer in 2014 - 2015	N			Examination		
Offer in 2015 - 2016	Υ					
Course Grade	A+ to F					
Grade Descriptors	A	A Evidence of complete or near-complete understanding and a thorough grasp of the subject matter as demonstrated by attainment of all learning outcomes. Excellent critique and knowledge of relevant literature and identification of research hypothesis. Well designed experimental approach to test research hypothesis. Show excellent organizational and/or analytical skills and laboratory/fieldwork techniques. Demonstrate comprehensive, critical, assessment of results and professional presentation of research work.				
	В	B Evidence of near-complete understanding and a good grasp of the subject matter as demonstrated by attainment of the majority of learning outcomes. Good critique and knowledge of relevant literature and identification of research hypothesis. Appropriately designed experimental approach to test research hypothesis. Show good organizational and/or analytical skills and laboratory/fieldwork techniques. Demonstrate effective, critical, assessment of results and good presentation of research work.				
	С	Evidence of adequate understanding and grasp of the subject matter as demonstrated by general but incomplete attainment of most of the learning outcomes. Acceptable critique and knowledge of relevant literature and identification of research hypothesis. Adequately designed experimental approach to test research hypothesis. Show fair organizational and/or analytical skills and laboratory/fieldwork techniques. Demonstrate adequate but not necessarily critical, assessment of results and presentation of research work.				
	D	D Evidence of limited understanding and grasp of the subject matter as demonstrated by incomplete attainment of many of the learning outcomes. Limited critique and knowledge of relevant literature and identification of research hypothesis. Poorly designed experimental approach to test research hypothesis. Show fair organizational and/or analytical skills and laboratory/fieldwork techniques. Demonstrate confused and poorly organized assessment of results and limited presentation of research work.				
	Fail	are not attained. Poor critique designed experimental approach	understanding and grasp of the subject n and knowledge of relevant literature an ht to test research hypothesis. Show little (fieldwork techniques. Demonstrate incor rich work.	d identification of resear evidence of appropriate	ch hypothesis. Badly organizational and/or	
Course Type	Project-b	ased course				
Course Teaching	Activitie	es	Details		No. of Hours	
& Learning Activities	Reading	J / Self study	formal lectures, practical work	seminars &	14	
Assessment Methods and Weighting	Method	s	Details		Veighting in fina course grade (%	
	Disserta	Dissertation			80	
	Oral pre	sentation	research seminar		20	
Course Website	http://ww	w.biosch.hku.hk/ecology/lsc/				
	A disser	<b>~</b>				

BIOL4993 Molecular biology & biotechnology project (12 credits)  Aca			2014
Offering Department	Biological Sciences	Quota	30

Course Co-ordinator	Prof G A V	Williams, Biological Sciences (hrsbwga@	Phku.hk)			
Teachers Involved	All acader	nic staff, Biological Sciences				
Course Objectives	undergrad Biotechno	To provide a stimulating capstone experience for all Molecular Biology & Biotechnology Major 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 a nember of staff.				
Course Contents & Topics	to the cou	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 succes	ssful completion of this course, students	should be able to:			
	2. use this 3. develop 4. design 5. analyse 6. present 7. draw ar 8. highligh 9. submit	critique and review appropriate scientific literature. use this information to generate a scientifically relevant research question. develop and formulate scientific hypotheses to test this question. design and undertake practical research work to formally test the hypotheses proposed. analyse and evaluate the data collected to test the hypotheses. present data in a professional manner to illustrate the outcomes. draw an objective series of conclusions based on the experimental work. highlight and discuss their research findings and place them into a holistic scientific context. submit their work following a specified journal format.  D. present their work as a scientific conference talk.				
Pre-requisites (and Co-requisites and Impermissible combination)	Molecular Cumulativ	t least 24 credits of advanced level biol Biology & Biotechnology Major; and e GPA of 3.0 or above. tone course is for Molecular Biology & Bi	· ·	X or BIOL4XXX) in the		
Offer in 2014 - 2015	N		Examination	on		
Offer in 2015 - 2016	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 experimental approach to test research hypothesis. Show excellent organizational and/or analytical skills and laboratory/fieldwork techniques. Demonstrate comprehensive, critical, assessment of results and professional presentation of research work.					
	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.					
	Evidence of adequate understanding and grasp of the subject matter as demonstrated by general but incomplete attainment of most of the learning outcomes. Acceptable critique and knowledge of relevant literature and identification of research hypothesis. Adequately designed experimental approach to test research hypothesis. Show fair organizational and/or analytical skills and laboratory/fieldwork techniques. Demonstrate adequate but not necessarily critical, assessment of results and presentation of research work.					
	D Evidence of limited understanding and grasp of the subject matter as demonstrated by incomplete attainment of many of the learning outcomes. Limited critique and knowledge of relevant literature and identification of research hypothesis. Poorly designed experimental approach to test research hypothesis. Show fair organizational and/or analytical skills and laboratory/fieldwork techniques. Demonstrate confused and poorly organized assessment of results and limited presentation of research work.					
	Fail	Evidence of poor or inadequate understanding are not attained. Poor critique and knowledge designed experimental approach to test resear analytical skills and laboratory/fieldwork technand poor presentation of research work.	e of relevant literature and identification of rch hypothesis. Show little evidence of appro	research hypothesis. Badly opriate organizational and/or		
	Project-based course					
Course Type	Project-ba					
Course Teaching			Details	No. of Hours		
Course Teaching	Activities		Details formal lectures, seminars & practical work			
Course Teaching & Learning Activities Assessment Methods	Activities	s / Self study	formal lectures, seminars &	144 Weighting in final		
Course Type Course Teaching & Learning Activities Assessment Methods and Weighting	Activities Reading	s / Self study	formal lectures, seminars & practical work	No. of Hours 144 Weighting in final course grade (%)		
Course Teaching & Learning Activities Assessment Methods	Activities Reading	s / Self study	formal lectures, seminars & practical work	Weighting in fina		
Course Teaching & Learning Activities Assessment Methods	Activities Reading Methods Dissertati Oral pres	s / Self study	formal lectures, seminars & practical work  Details	Weighting in fina course grade (%)		

BIOL4994 Biological se	ciences project (12 credits)	Academic Yea	ar 2014	
Offering Department	Biological Sciences	Quota	30	
Course Co-ordinator	Prof G A Williams, Biological Sciences (hrsbwga@hku.hk)	Prof G A Williams, Biological Sciences (hrsbwga@hku.hk)		
Teachers Involved	All academic staff, Biological Sciences	All academic staff, Biological Sciences		
Course Objectives	To provide a stimulating capstone experience for all Biological and apply their knowledge and skills obtained from the Biolo carrying out a research project under the supervision of a member of the supervision of a member of the supervision of the supervision of a member of the supervision of the	gical Science Major thr		

Course Contents & Topics	to the co	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	1. critique 2. use this 3. develop 4. design 5. analyse 6. presen 7. draw a 8. highligl 9. submit	ssful completion of this course, students of and review appropriate scientific literatures information to generate a scientifically report and formulate scientific hypotheses to the and undertake practical research work to and evaluate the data collected to test the data in a professional manner to illustrate in objective series of conclusions based on and discuss their research findings and their work following a specified journal for their work as a scientific conference tal	e. elevant research question. est this question. formally test the hypothese he hypotheses. e the outcomes. In the experimental work. place them into a holistic s mat.		ext.	
Pre-requisites (and Co-requisites and Impermissible combination)	Biological Cumulativ	Pass in at least 24 credits of advanced level 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.				
Offer in 2014 - 2015	N		Exa	mination		
Offer in 2015 - 2016	Y					
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 experimental approach to test research hypothesis. Show excellent organizational and/or analytical skills and laboratory/fieldwork techniques. Demonstrate comprehensive, critical, assessment of results and professional presentation of research work.					
	B Evidence of near-complete understanding and a good grasp of the subject matter as demonstrated by attainment of the majority of learning outcomes. Good critique and knowledge of relevant literature and identification of research hypothesis. Appropriately designed experimental approach to test research hypothesis. Show good organizational and/or analytical skills and laboratory/fieldwork techniques. Demonstrate effective, critical, assessment of results and good presentation of research work.					
	C Evidence of adequate understanding and grasp of the subject matter as demonstrated by general but incomplete attainment of most of the learning outcomes. Acceptable critique and knowledge of relevant literature and identification of research hypothesis. Adequately designed experimental approach to test research hypothesis. Show fair organizational and/or analytical skills and laboratory/fieldwork techniques. Demonstrate adequate but not necessarily critical, assessment of results and presentation of research work.					
	D Evidence of limited understanding and grasp of the subject matter as demonstrated by incomplete attainment of many of the learning outcomes. Limited critique and knowledge of relevant literature and identification of research hypothesis. Poorly designed experimental approach to test research hypothesis. Show fair organizational and/or analytical skills and laboratory/fieldwork techniques. Demonstrate confused and poorly organized assessment of results and limited presentation of research work.					
	Fail	Evidence of poor or inadequate understanding a are not attained. Poor critique and knowledge designed experimental approach to test researc analytical skills and laboratory/fieldwork techni- and poor presentation of research work	of relevant literature and identific th hypothesis. Show little evidence	cation of researd e of appropriate	ch hypothesis. Badly organizational and/or	
Course Type	Project-ba	ased course				
Course Teaching & Learning Activities	Activitie	s	Details		No. of Hours	
a Learning Activities	Reading	/ Self study	formal lectures, seminary	ars &	144	
Assessment Methods and Weighting	Methods	3	Details		Veighting in final course grade (%)	
	Dissertat	ion			80	
	Oral pres	sentation	research seminar		20	
Course Website	http://www	v.biosch.hku.hk/ecology/lsc/				
Additional Course Information		ation of about 9,000 - 12,000 words (80 seminar (20% weighting).	0% weighting) should be s	submitted by	April 15th and a	

ENVS1301 Environmental	life science (6 credits)	Academic Year	2014
Offering Department	Biological Sciences	Quota	40
Course Co-ordinator	Dr T Vengatesen, Biological Sciences (rajan@hku.hk)		
Teachers Involved	Dr T Vengatesen, Biological Sciences		
Course Objectives	This course intended for students who wish to understand the fundamentals of environmental biology/life science and importantly the relationship (connection) between environment and life. Here you will learn about the various biological/ecological principles and concepts of environmental science which are needed for critical discussion and evaluation of current global environmental issues including human ecology, urbanization, ecological economics, and climate change.		
Course Contents & Topics	This course is a combination of lectures, group discussion/debate explore the fundamental interactions between organisms and the environmental constraints on life at various ecosystems (like marine will also learn how factors such as urbanization, climate change, ar population and ecosystem levels. Similarly, students will be exposited are basic to ecological principles and the impact that hu	neir environment. W , freshwater, and term ad anthropogenic imp sed to the incredible	le then explore restrial). Students pacts affect life a interrelationships

	about cu	onships. After learning basics of er rrent life science issues such as f commons (human ecology) and ap	biodiversity loss, organis	sms adaptation to	climate change,	
Course Learning Outcomes	On successful completion of this course, students should be able to:  1. Understand: Life, Environment and their interactions.  2. Appreciate: Species and ecosystem responses to human-induced environmental change.  3. Attain: Ability to critically think and discuss about current environ-life science issues.  4. Be motivated and equipped: to tackle biological environmental science questions and to choose advanced environmental science courses.					
Pre-requisites (and Co-requisites and Impermissible combination)	NIL					
Offer in 2014 - 2015	Y 1st	Y 1st sem Examination Dec			Dec	
Offer in 2015 - 2016	Υ	Y				
Course Grade	A+ to F					
Grade Descriptors	В	Evidence of original thought during the critical and multidimensional thinking ab all the course learning outcomes. Demoi critically analyze the real environmental field trip skills.  Show substantial knowledge and thoug evidence of some analytical, critical and skills required for attaining all the coun learned in the class room to critically	out the study subject. Extensive nstrate excellent ability to apply life science issues. Show highly that during the analysis of envirous d multidimensional thinking about se learning outcomes. Demons	e knowledge and skills what you have learne y effective organization ronmental life science to the study subject. strate good ability to state.	required for attaining d in the class room to al, presentational and issues. Show some Good knowledge and apply what you have	
	С	organizational, presentational and field trip skills.  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 Evidence to show a minimum knowledge (i.e. knowledge is very incomplete) and thought during the analysis of environmental life science issues. Show insufficient knowledge and skills required for attaining all the course learning outcomes. Demonstrate poor ability to apply what you have learned in the class room to critically analyze the real environmental life science issues. Show very little organizational, presentational and field trip skills.					
	Fail	Fail  Evidence of meager or inadequate knowledge and understanding of environmental life science issues. Show no evidence of knowledge and skills required for attaining all the course learning outcomes. Demonstrate no ability to apply what you have learned in the class room to critically analyze the real environmental life science issues. Show no evidence of familiarity with relevant reading material and field trip demonstrations, or any knowledge of organizational and presentational skills.				
Carrea Trea		rith laboratory component course				
Course Type	Lecture w					
Course Type Course Teaching	Lecture w		Details		No. of Hours	
Course Teaching		s	Details		No. of Hours	
Course Teaching	Activitie	s	Details  3-12 hours field wor	rk	24	
Course Teaching	<b>Activitie</b> Lectures	rk		k	24	
Course Teaching	Activitie Lectures Field wor Tutorials	rk		k	24 12	
Course Teaching & Learning Activities  Assessment Methods	Activitie Lectures Field wor Tutorials	rk / Self study			24 12 12 100 Weighting in final	
Course Teaching & Learning Activities  Assessment Methods	Activitie Lectures Field wo Tutorials Reading	rk / Self study	3-12 hours field wor		24 12 12 100 Weighting in final course grade (%)	
Course Teaching & Learning Activities  Assessment Methods	Activitie Lectures Field wo Tutorials Reading	rk / Self study s	3-12 hours field wor		24 12 12 100 Weighting in final course grade (%)	
Course Teaching & Learning Activities  Assessment Methods	Activitie Lectures Field won Tutorials Reading  Methods  Assignm	rk / Self study s ents	3-12 hours field wor		24 12 12	
	Activitie Lectures Field wor Tutorials Reading  Methods  Assignm Examina	rk / Self study s ents	3-12 hours field wor		24 12 12 100 Weighting in final course grade (%) 10 70	
Course Teaching & Learning Activities  Assessment Methods	Activitie Lectures Field won Tutorials Reading  Methods  Assignm Examina Presenta Test	rk / Self study s ents	3-12 hours field wor  Details  group presentation	1	24 12 100 Weighting in final course grade (%) 10 70	
Course Teaching & Learning Activities  Assessment Methods and Weighting  Required/recommended	Activitie Lectures Field wor Tutorials Reading  Methods  Assignm Examina Presenta Test  Appropria	rk / Self study s ents tion	3-12 hours field wor  Details  group presentation	1	24 12 12 100 Weighting in final course grade (%) 10 70	

ENVS2001 Environment	al field and lab course (6 credits)	Academic Year	2014
Offering Department	Biological Sciences	Quota	30
Course Co-ordinator	Dr D M Baker, Biological Sciences (dmbaker@hku.hk)		
Teachers Involved	Dr D M Baker, School of Biological Science		
Course Objectives	To introduce students to a broad spectrum of field and laboratory methods for data collection in environments science. Through exposure to environmental data collection, experimental design, data analysis, interpretatio and reporting, students will gain a deeper appreciation of the process that underlies environmental science research and it's relevancy to critical thinking and future careers in the sciences.		
Course Contents & Topics	This course will involve environmental data collection in both field and lat cover basic principles of specific methodologies and relevant application field-based experiential learning. Having an interdisciplinary focus, the cuttudy of the biosphere, encompassing terrestrial, aquatic, and atmospherent on experience with the operation of standard and advanced sampling and	ons in preparation to course will cover toperic systems. Studer	for laboratory and ics relevant to the nts will gain hands

	basic da	ta analysis and reporting.				
Course Learning Outcomes	On succ	essful completion of this course	e, students should be able to:			
	2. Have data.	rstand how scientific data is use a basic understanding of the	techniques and methodologie	s necessary for colle	· ·	
		<ol> <li>Understand some of the problems inherent in data collection, and how this impacts data interpretation.</li> <li>Understand how data collected in the lab and field can be used to critically evaluate ideas.</li> </ol>				
Pre-requisites (and Co-requisites and (mpermissible combination)		Pass in ENVS1301 Environmental life science or ENVS1401 Introduction to environmental science or EASC1401 Blue planet or BIOL1309 Evolutionary diversity				
Offer in 2014 - 2015	Y 1s	st sem		Examination	No Exam	
Offer in 2015 - 2016	Υ			'		
Course Grade	A+ to F					
Grade Descriptors	A Demonstrate thorough grasp of the subject. Show strong analytical and critical abilities and logical thinking, of original thought. Apply highly effective lab / fieldwork skills and techniques. Critical use of data and re appropriate and insightful conclusions. Apply highly effective organizational and presentational skills.				ata and results to draw	
	В					
	С	C Demonstrate general but incomplete grasp of the subject. Evidence of some analytical and critical abilities and logical thinking. Apply moderately effective lab / fieldwork skills and techniques. Mostly correct but some erroneous use of data and results to draw appropriate conclusions. Apply moderately effective organizational and presentational skills.				
	D	D Demonstrate partial but limited grasp, with retention of some relevant information, of the subject. Evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Apply partially effective lab / fieldwork skills and techniques. Limited ability to use data and results to draw appropriate conclusions. Apply limited or barely effective organizational and presentational skills.				
	Fail	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. Apply minimally effective or ineffective lab / 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	Laborato	ory and workshop course				
Course Teaching	Activiti	es	Details		No. of Hours	
& Learning Activities	Laborat	cory			30	
	Field wo	ork			10	
	Project	work			20	
	Tutorial	S			12	
	Reading	g / Self study			60	
Assessment Methods and Weighting	Method	is	Details		Weighting in final course grade (%)	
	Assignn	nents			10	
	Laborat	ory reports			20	
	Present	tation			20	
	Project	reports			50	
Course Website	http://wax	ww.biosch.hku.hk/ecology/lsc/	, , , , , , , , , , , , , , , , , , ,	'		

<b>ENVS2002 Environmental</b>	data analysis (6 credits)	Academic Year	2014	
Offering Department	Biological Sciences	Quota	50	
Course Co-ordinator	Dr T C Bonebrake, Biological Sciences (tbone@hku.hk)			
Teachers Involved	Dr T C Bonebrake, School of Biological Science			
Course Objectives	To provide students with the ability to analyze data; especially questions in environmental science. This course will enable studisplay, test and analyze environmental data. The course will all variety of important advanced approaches in analyzing environ geographic information systems, remote sensing, risk assessment	dents to accurately in so introduce students mental data including	terpret, organize to principles of a spatial analysis	
Course Contents & Topics	The course will feature lectures on aspects of sampling, dist hypothesis testing in addition to lectures on advanced analysis to qualities inherent to most environmental datasets such as large si will be applied and practiced in environmental science contexts oceanography) using a variety of datasets in a computer labor Statistical Computing' software (a graphical user interface will be of coding or computer science is not required).	oics. Special emphasis ze, multivariate, and s (e.g. chemistry, ecoloratory setting using the	will be placed or patial. All materia ogy, geology and ne 'R Project for	
Course Learning Outcomes	On successful completion of this course, students should be able to 1. Accurately interpret methods and approaches in the scientific litt 2. Evaluate critically data analyses in the environmental sciences. 3. Perform standard and appropriate statistical analyses on a varie 4. Work comfortably with large datasets using applied software (e.	erature. ty of data sources.		
	360			

	5. Prese	nt results of data analyses in a clear	and transparent manner.			
Pre-requisites (and Co-requisites and Impermissible combination)	EASC14	Pass in ENVS1301 Environmental life science or ENVS1401 Introduction to environmental science or EASC1401 Blue planet or BIOL1309 Evolutionary diversity				
Offer in 2014 - 2015	Y 2r	nd sem	Examinat	tion May		
Offer in 2015 - 2016	Y					
Course Grade	A+ to F					
Grade Descriptors	A	A Demonstrate thorough grasp of the subject and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought. Apply a highly effective computational skills and techniques for basic statistical analyses. Be able to critically use data and statistical results to draw appropriate and insightful conclusions. Apply highly effective organizational and presentational skills.				
	В					
	С	outcomes. Present evidence of some and computational skills and techniques for	sp of the subject and skills required for attain nalytical and critical abilities and logical think basic statistical analyses. Demonstrate mos aw appropriate conclusions. Apply moderate	ting. Apply moderately effective tly correct but some erroneous		
	D	D Demonstrate partial and limited grasp of the subject and skills required for attaining some of the course learning outcomes. Present evidence of some analytical and critical abilities and logical thinking, but with limited analytical and critical abilities. Apply limited or barely effective computational skills and techniques for basic statistical analyses. Demonstrate limited ability to use data and statistical results to draw appropriate conclusions. Apply limited or barely effective organizational and presentational skills.				
	Fail	Fail  Demonstrate limited or no grasp of the subject and skills required for attaining any of the course learning outcomes. Present evidence of little or lack of analytical and critical abilities, logical or coherent thinking. Apply minimally effective or ineffective computational skills and techniques for basic statistical analyses. Demonstrate misuse of data and statistical results and/or unable to draw appropriate conclusions. Apply minimally effective or ineffective organizational and presentational skills.				
Course Type	Lecture	with laboratory component course				
Course Teaching	Activities Deta		Details	No. of Hours		
& Learning Activities	Lecture	S		24		
	Laboratory		problem-based learning/computer laboratory	24		
	Tutorial	S		6		
Assessment Methods and Weighting	Method	ls	Details	Weighting in fina course grade (%)		
	Examina	ation		25		
	Project	report		25		
	Test		problem-based exercises	50		
Required/recommended reading and online materials	Shahbab New Yor Reimann	Textbooks: Shahbaba, B. 2012. Biostatistics with R: An Introduction to Statistics through Biological Data. Springe New York. Reimann, C. et al. 2007. Statistical Data Analysis Explained: Applied Environmental Statistics with R. Joh Wiley & Sons, Chichester.				
	Reference Zhang C	ces: . 2007. Fundamentals of Environme	ntal Sampling and Analysis. John Wi	iley & Sons, New Jersey.		

	(6 credits)	Academic Year	2014
Offering Department	Biological Sciences	Quota	50
Course Co-ordinator	Dr T C Bonebrake, Biological Sciences (tbone@hku.hk)		
eachers Involved	Dr T C Bonebrake, School of Biological Science		
Course Objectives	This course will provide students with an understanding and knowledge of the ecology of urban ecosystems. The course will highlight the role of cities in a world under environmental change and rapid development.		
Course Contents & Topics	Ecological systems within cities and cities as ecological systems will both be covered in this course. Ecological concepts unique to or specialized within cities will be covered including sustainability, conservation, health, development, globalization, and restoration. Specific topics will include climate change (e.g. urban heat island effects), invasive species, infectious diseases and pollution. Examples will be taken globally but special emphasis will be placed on Hong Kong.		
Course Learning Outcomes	On successful completion of this course, students should be able to:  1. Describe and evaluate the processes and patterns that characterize 2. Understand biodiversity and ecosystem responses to urbanization. 3. Recognize energy flows within urban ecosystems and how energy environmental quality. 4. Critically evaluate management and policy solutions to urban ecolog	use and waste improv	
Pre-requisites	Pass in ENVS2001 Environmental field and lab course or ENVS20	002 Environmental da	ata analysis or

(and Co-requisites and Impermissible combination)	BIOL2306	6 Ecology and evolution				
Offer in 2014 - 2015	N		Examination	on		
Offer in 2015 - 2016	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, 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	the course learning outcomes. Show evide	pad range of knowledge and skills required for ence of analytical and critical abilities and log e to familiar and some unfamiliar situation tion to thoughtful and reflective thinking.	ical thinking, integration of		
	С					
	D	D Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities and little attempt at integration. Show limited ability to apply knowledge to solve problems. Apply limited effectiveness in presentational skills. Lack of attention to thoughtful and reflective thinking.				
	Fail	outcomes. Lack of analytical and critical ab	nand of knowledge and skills required for at illities, logical and coherent thinking. Show ve and presentational skills are minimally effective	ry little or no ability to apply		
Course Type	Lecture-b	ased course				
Course Teaching	Activitie	S	Details	No. of Hours		
& Learning Activities	Lectures			36		
	Tutorials			12		
	Reading / Self study			100		
Assessment Methods and Weighting	Methods	3	Details	Weighting in final course grade (%)		
	Examina	tion	Mid-term exam (20%), Final exam (30%)	50		
	Presenta	ition		20		
	Project re	eports		30		
Required/recommended reading and online materials	Niemela Processe Reference	Textbooks: Niemela J, Breuste JH, Elmqvist T, Guntenspergen PJ, McIntyre NE (2011) Urban Ecology: Patterns, Processes, and Applications. Oxford University Press, Oxford.  References: Gaston KJ (2010) Urban ecology. Cambridge University Press, Cambridge.				
Course Website		v.biosch.hku.hk/ecology/lsc/	,,			
Additional Course Information	This cours	se will be offered subject to a minimum se will be offered in alternative year.	n enrollment number and availability	of teachers.		

	ecology (6 credits)	Academic Year	2014	
Offering Department	Biological Sciences	Quota	50	
Course Co-ordinator	Dr C Dingle, Biological Sciences (cdingle@hku.hk)			
Teachers Involved	Dr C Dingle, Biological Sciences			
Course Objectives	To introduce students to the ways in which environmental change affects biodiversity from organisms ecosystems. This course will explore the contributions that human population growth and globalizatic have made to increases in greenhouse gases and associated climate change, biological invasions, lar degradation, disease, and, ultimately, impacts on biological systems.			
Course Contents & Topics	Environmental change is a natural phenomenon, with ecosystem emerging, and disappearing through geologic time with changes in humans have added to this natural variation, increasing the menvironmental change occurs. This course will focus principally or organisms and ecosystems but will also investigate other topics registive use change, biological invasions, and eutrophication. We will explore (is manifested including climate warming, sea level rise, and ocean a land use change; (3) how globalization has contributed to the spread of	climatic conditions.  nagnitude and spent the effects of clinering on a global script what climate chancidification; (2) type	The activities of the decivities of the decivition of the decivities of the deciviti	
	increases in eutrophication of aquatic ecosystems with a focus on m investigate how these human-caused stressors affect the morpho evolution of organisms and their impacts on ecosystem functioning ar and terrestrial ecosystems.	logy, phenology, d	I disease; and ( . The course w listributions, an	

	ecosystem level. 3. Understand the differences between climate change on a geologic time scale and recent cli change. 4. Be aware of the relationships between humans and global change.  Pass in ENVS2001 Environmental field and lab course or ENVS2002 Environmental data analyse.				
Pre-requisites (and Co-requisites and Impermissible combination)		NVS2001 Environmental field and la Ecology and evolution	b course or ENVS2002 Environmen	tal data analysis or	
Offer in 2014 - 2015	Y 2nd	sem	Examination	May	
Offer in 2015 - 2016	N		·	'	
Course Grade	A+ to F				
Grade Descriptors	A	course learning outcomes. Show strong and thought, ability to integrate and synthesize in	nced level of extensive knowledge and skills lytical and critical abilities and logical thinking, nformation, and ability to apply knowledge to a nly effective presentational skills. Strong evide	with evidence of original wide range of complex,	
	В				
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective presentational skills. 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. Show limited ability to apply knowledge to solve problems. Apply limited effectiveness in presentational skills. Lack of attention to thoughtful and reflective thinking.			
	Fail  Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.				
Course Type	Lecture-ba	ased course			
Course Teaching	Activities		Details		
			Details	No. of Hours	
& Learning Activities	Lectures	•	Details	No. of Hours	
& Learning Activities	Lectures Tutorials		tutorial & 20 hours of problem- based learning		
& Learning Activities	Tutorials	'Self study	tutorial & 20 hours of problem-	24	
Assessment Methods	Tutorials		tutorial & 20 hours of problem-	24 44	
Assessment Methods	Tutorials Reading /	Self study	tutorial & 20 hours of problem- based learning	24 44 100 Weighting in final	
Assessment Methods	Tutorials Reading /	Self study	tutorial & 20 hours of problem- based learning  Details  problem-based exercises (10%),	24 44 100 Weighting in final course grade (%)	
Assessment Methods	Tutorials Reading / Methods Assignment	Self study	tutorial & 20 hours of problem- based learning  Details  problem-based exercises (10%),	24 44 100 Weighting in final course grade (%) 20	
& Learning Activities  Assessment Methods and Weighting	Tutorials Reading / Methods Assignme Essay	Self study ents	tutorial & 20 hours of problem- based learning  Details  problem-based exercises (10%),	24 44 100 Weighting in final course grade (%) 20 30	
Assessment Methods	Tutorials Reading / Methods Assignme Essay Examinat Presentat Lovejoy, T CT, USA. Araujo, M. Grimm, N. change an	Self study ents	tutorial & 20 hours of problembased learning  Details  problem-based exercises (10%), continuous assessment (10%)  ange and Biodiversity. Yale University imate change affect biodiversity? Sciedman, C.L., Wu J., Bai, X., and Brigg 56-760.	24 44 100 Weighting in final course grade (%) 20 30 40 10 Press, New Haven, ence 313:1396-1397. ps, J.M. 2008. Global	
Assessment Methods and Weighting  Required/recommended reading	Tutorials Reading / Methods Assignme Essay Examinat Presentat Lovejoy, T CT, USA. Araujo, M. Grimm, N. change an Schlesinge	ents  ion i.E. and Hannah, L. 2005. Climate Cha B., and Rahbek, C. 2006. How does cl B., Faeth, S.H., Golubiewski, N.E., Re d the ecology of cities. Science 319:75	tutorial & 20 hours of problembased learning  Details  problem-based exercises (10%), continuous assessment (10%)  ange and Biodiversity. Yale University imate change affect biodiversity? Sciedman, C.L., Wu J., Bai, X., and Brigg 56-760.	24 44 100 Weighting in final course grade (%) 20 30 40 10 Press, New Haven, ence 313:1396-1397. ps, J.M. 2008. Global	

<b>ENVS4110 Environmental</b>	remediation (6 credits)	Academic Year	2014	
Offering Department	Biological Sciences	Quota	30	
Course Co-ordinator	Dr J D Gu, Biological Sciences (jdgu@hku.hk)			
Teachers Involved	Dr J D Gu, Biological Sciences			
Course Objectives	To introduce students with the environmental fate information of different pollutants/contaminants in the environment  To understand the technologies available for environmental remediation of pollutants in soils and water and the characteristics of each techniques relevant to the pollutants of concern  To learn the fundamental physical, chemical and biochemical reactions involved in the remediation proces  To obtain skills for critical analysis of the recent technological development and the proposed applications			
Course Contents & Topics	Understanding the types of different pollutants and their fate in the e and aquatic; and relevant strategy of pollution control and treatment treatment and phytoremediation; mechanisms of biochemical transfor polychlorinated biphenols, agrichemicals and phthalate esters as biochemical pathways and the specific genes involved in detoxificat degradation pathways in bacteria; transport of microorganisms and r survival of introduced organisms; evolution of the degradative ge remediation techniques; green technologies.	; advanced oxidation, rmation of polyaromat well as both metals a tion; chemotaxis and nonitoring in subsurfac	microbiologica tic hydrocarbon and metalloids; engineering the ce environment	

Course Learning Outcomes	On success	successful completion of this course, students should be able to:					
	Explain practice.	the remediation technologies avai	lable to the type of po	ollutants of concern	n in remediation		
	<ol> <li>Propose remediation strategies for polluted sites with the best technologies available considerin type of pollutants and the cost involved.</li> <li>Differentiate the technologies available for the specific pollutants and the fundamental process invin terms of the catalysts and the effectiveness.</li> <li>Describe several key chemical and biochemical processes used in environmental remediation adequate background information on their history and development.</li> </ol>						
Pre-requisites (and Co-requisites and Impermissible combination)		IOL3109 Environmental microbiolo piology or ENVS3042 Pollution	gy or BIOL3110 Envir	onmental toxicolog	gy or BIOL3401		
Offer in 2014 - 2015	N			Examination			
Offer in 2015 - 2016	Υ			·	'		
Course Grade	A+ to F	+ to F					
Grade Descriptors	A	Thorough mastery at an advanced level learning outcomes. Thorough grasp of the logical thinking, with evidence of original th and results to draw appropriate and insighskills.	subject matter. Show very st ought. Apply highly effective I	rong analytical and critical and critical and skills and techniques	cal abilities and high c. Critical use of data		
	В	Substantial command of a broad range of learning outcomes. Substantial grasp of thinking. Apply effective lab skills and tech Apply effective organizational and presentations.	ne subject. Show evidence on niques. Correct use of data	of analytical and critical	abilities and logical		
	С	General but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. General but incomplete grasp of the subject. Evidence of some analytical and critical abilities and logical thinking. Apply moderately effective lab skills and techniques. Mostly correct but some erroneous use of data and results to draw appropriate conclusions. Apply moderately effective organizational and presentational skills.					
	D	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 wit	h laboratory component course					
Course Teaching	Activities		Details		No. of Hours		
& Learning Activities	Lectures				24		
	Laboratory	/			8		
	Field work				6		
	Project wo	ork			6		
	Tutorials						
	Tatoriais				4		
	Reading /	Self study			100		
		Self study	Details		'		
	Reading /	·	Details		100 eighting in final		
	Reading / Methods	nts	Details		100 eighting in final ourse grade (%)		
	Reading / Methods Assignment	nts	Details		100 reighting in final ourse grade (%)		
	Reading / Methods Assignment Examination	nts on y reports	Details		leighting in final ourse grade (%)		
	Reading / Methods Assignment Examination Laboratory	nts on y reports	Details		leighting in final ourse grade (%)		
Assessment Methods and Weighting  Required/recommended reading and online materials	Reading / Methods  Assignment Examination Laboratory Presentation Test  C.J. Hurst: S.C. McCur	nts on y reports	gy (ASM Press, 2nd ed ation: Transformation a	ition)	leighting in final ourse grade (%)  10  50  25  10  5		
and Weighting  Required/recommended reading	Reading / Methods  Assignment Examination Laboratory Presentation Test  C.J. Hurst: S.C. McCur	nts on y reports on  Manual of Environmental Microbiolo tcheon & J.L. Schnoor: Phytoremed & J-D Gu: Environmental Microbiolo	gy (ASM Press, 2nd ed ation: Transformation a	ition)	leighting in final ourse grade (%)  10  50  25  10  5		

ENVS4955 Environmen	ntal science in practice (6 credits)	Academic Year	2014		
Offering Department	Biological Sciences	Quota	18		
Course Co-ordinator	Dr M Yasuhara, Biological Sciences (yasuhara@hku.hk)	Dr M Yasuhara, Biological Sciences (yasuhara@hku.hk)			
Teachers Involved	Dr M Yasuhara, Biological Science	Dr M Yasuhara, Biological Science			
Course Objectives	To provide students experiential learning experience in the field of environmental science. The course is primarily based on an array of field studies covering essential areas of environmental science as well as thesis style report on environmental science topic. Invited guest lectures delivered by environmental practitioners may be held.				

Course Contents & Topics		to attend a series of field studies in, and/c	or outside, Hong Kong throughout the	e final academic year.	
	core sam geology/p (2) Natur. Departme farms, Ma Park Visit (3) Enviro strategic research a Technolog (4) Enviro activities, In addition	ential field trip, for example, to Japan (the bling, practical learning of ecological, paraleontology field trip, and other tours and all resource management and conservent, Fish Marketing Organization, local fish in Po RAMSAR Site, Hong Kong Wettlander Centre, and Marine Parks and Reservent and Individual science and technologies: visite landfill sites, power plants, Environment and development of green technology), Capy; and the visiting Environmental Lab: visiting Environmental Science and technology, Capy; and the visiting Environmental Science and technology, Capy; and the visiting Environmental Science and the course includes thesis style report to be provided. Alternatively, students may	aleoecology and environmental probactivities); ation: visiting Agriculture, Fisheries sheries organizations, agriculture/aq dd Park, Hong Kong Organic Resouss; ing water treatment plant, waste wortal Management Division of Productive for Marine Environmental Rescience and other Pl's laboratory, lostudents, and writing a short article of the organization of the production of the productio	olems, environmental s and Conservation uaculture/mariculture urce Centre, Country ater treatment plant, uctivity Council (for earch and Innovative poking into research on the Lab.	
Course Learning Outcomes	1. Recogr 2. Gain kr	ssful completion of this course, students s lize ways of environmental science in pra lowledge of current environmental proble	ctice. ms and solutions.		
	_	and communicate their field observation			
Pre-requisites (and Co-requisites and Impermissible combination)	Science M Students	Pass in at least 24 credits of advanced level (level 3 or 4) compulsory/core courses in Environmental Science Major.  Students are expected to have satisfactorily completed their Year 3 study in Environmental Science Major.  This capstone course is for Environmental Science Major students only.			
Offer in 2014 - 2015	N	N Examination			
Offer in 2015 - 2016	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. Apply highly effective lab / fieldwork skills and techniques. Critical use of data and results to draw appropriate and insightful conclusions. Apply highly effective organizational and presentational skills.				
	B Demonstrate substantial grasp of the subject. Evidence of analytical and critical abilities and logical thinking. Apply effective lab / fieldwork skills and techniques. Correct use of data of results to draw appropriate conclusions. Apply effective organizational and presentational skills.				
	C Demonstrate general but incomplete grasp of the subject. Evidence of some analytical and critical abilities and logical thinking. Apply moderately effective lab / fieldwork skills and techniques. Mostly correct but some erroneous use of data and results to draw appropriate conclusions. Apply moderately effective organizational and presentational skills.				
	D Demonstrate partial but limited grasp, with retention of some relevant information, of the subject. Evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Apply partially effective lab / fieldwork skills and techniques. Limited ability to use data and results to draw appropriate conclusions. Apply limited or barely effective organizational and 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. Apply minimally effective or ineffective lab / 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	Laborator	y and workshop course			
Course Teaching	Activitie		Details	No. of Hours	
& Learning Activities	Field wor		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 study		100	
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	
	Laborato	ry reports	field report	30	
	Presenta	tion	group presentation	30	
	Project re	eports	individual report	40	
Course Website	http://www	v.biosch.hku.hk/ecology/lsc/			
Additional Course Information	Some trip own trave (please co	s will be organized in reading weeks, an I cost for the residential field trip. ontact us for details and financial difficulty se will be offered subject to a minimum er	).		

ENVS4966 Environmental science internship (6 credits)		Academic Year	2014		
Offering Department	Biological Sciences	Biological Sciences Quota			
Course Co-ordinator	Dr C Dingle, Biological Sciences (cdingle @hku.hk)	Or C Dingle, Biological Sciences (cdingle@hku.hk)			
Teachers Involved	Dr C Dingle, Biological Sciences All Academic Staff, Biological Sciences				
Course Objectives	To offer students the opportunities to gain work experience in a	To offer students the opportunities to gain work experience in applying knowledge and skills gained in the			

	study of the	e major to the real work environmen	t.		
Course Contents & Topics	Students will be supervised by a staff member (the Internal Supervisor) within the University of Hong Kong as instructed by the Internal Supervisor. In the case of the work being carried out in an external agency, students will be supervised by a staff member of the external agency (the External Supervisor) and a staff member of the University (the Internal Supervisor). 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 succes	sful completion of this course, stude	nts should be able to:		
	2. Acquire	1. Gain at least 4 weeks of work experience environmental-related firm or the Government. 2. Acquire an understanding and appreciation of the real work environment. 3. Have some experience with applying learned knowledge to solving real world problems.			
Pre-requisites (and Co-requisites and Impermissible combination)	Science M Students a	Pass in at least 24 credits of advanced level (level 3 or 4) compulsory/core courses in Environmental Science Major. Students are expected to have satisfactorily completed their Year 3 study in Environmental Science Major. This capstone course is for Environmental Science Major students only.			
Offer in 2014 - 2015	Y 2nd	sem Summer		Examination	No Exam
Offer in 2015 - 2016	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  Very limited or no ability to solve problems in the workplace. Fails to handle or carry out the work required in the job or assigned by supervisor(s). Fails to establish effective collaboration or communication with supervisor(s), other colleagues, or clients in the job. Fails to satisfy the requirements set out in the Course Description regarding working hours, written and oral report, or evaluation by supervisor(s), etc.				
Course Type	Internship				
Course Teaching	Activities		Details		No. of Hours
& Learning Activities	Internship	work	it is expected that work at least 160 equivalent of 4 we	hours (or the	160
Assessment Methods and Weighting	Methods		Details		Weighting in final course grade (%)
	Written report		written report, feedback and oral	employer's presentation	100
Course Website	http://mood	dle.hku.hk/			
Additional Course Information	equivalent Students a those who Satisfactor internship Distinction obtain the Enrolment	of this course is not conducted vine relevant Department/School of	a staff member. Impleted their Year 3 stude The counted towards the transcript. This course and to enrol in this course at the online course se	idy. Special cons e Capstone requ will be assessed se should contact lection system at	ideration be given to irrement. Details of on "Pass, Fail and the Department to and should be made

CAES1000 Core Unive	rsity Engli	sh (6 credits)		Academic Year	2014	
Offering Department	English			Quota		
Course Co-ordinator	Dr M Leg	g (1st sem); Dr N Fong (2nd sem)	, English (mglegg@hku.hk;	fongsn@hku.hk)		
Teachers Involved	Dr M Leg	g (1st sem); Dr N Fong (2nd sem)	, Centre for Applied English	1 Studies		
Course Objectives						
Course Contents & Topics	proficience for the C spoken a manner a also com vocabula students	Core University English (CUE) course aims to enhance first-year students' academic English language skills in the university context. CUE focuses on developing students' academic English language skills in Common Core Curriculum. These include the language skills needed to understand and produce an and written academic texts, express academic ideas and concepts clearly and in a well-structured are and search for and use academic sources of information in their writing and speaking. Students will complete four online-learning modules through the Moodle platform on academic grammar, academic bulary, citation and referencing skills and understanding and avoiding plagiarism. This course will help ents to participate more effectively in their first-year university studies in English, thereby enriching their rear experience.				
Course Learning Outcomes	<ol> <li>Identif demonstr</li> <li>Form a</li> <li>Argue speaking</li> </ol>	successful completion of the course, students should be able to:  dentify and distinguish between main ideas and supporting details in lectures and written texts and nonstrate an understanding of the arguments / facts expressed; form and express personal opinions through critical reading and listening; figure for and defend a position in a clear and structured way using academic sources, through writing and aking; and the monstrate control of grammatical accuracy and lexical appropriacy in academic communication.				
Pre-requisites (and Co-requisites and Impermissible combination)	NIL					
Offer in 2014 - 2015	Y 1st	t sem 2nd sem		Examination	Dec May	
Offer in 2015 - 2016	Υ					
Course Grade	A+ to F					
Grade Descriptors	A	appropriately structured. Students can clearly and concisely explain academic concepts and critically argue for a detailed position. Students always use appropriate academic sources to support their ideas in writing and speaking. They cite and reference correctly at all times. Students demonstrate an ability to fully comprehend and critically interpret spoken and written texts. Written language contains very few, if any, systematic errors in grammar and vocabulary. Spoken language is always comprehensible and fluent.				
	В	Good to very good result. Students are able to produce spoken and written academic texts which are appropriately structured with only minor errors. Students can almost always clearly and concisely explain academic concepts and almost always critically argue for a detailed position. Students almost always use appropriate academic sources to support their ideas in writing and speaking. They cite and reference correctly with only a few non-systematic errors. Students can comprehend and interpret texts with ease, although they may miss some implied meanings and opinions. Written language is mostly accurate but contains a few systematic errors in complex grammar and vocabulary. Spoken language is mostly comprehensible and fluent.				
	С	Satisfactory to reasonably good result. Spoken and written academic texts produced by students are sometimes not-well 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.				
	D	Barely satisfactory result. Spoken and written academic texts produced by students are often inappropriately structured but there may be some evidence of this ability. Students are often unable to clearly and concisely explain academic concepts and argue for a position. There is some evidence of an ability to explain academic concepts but not to critically argue for a position. Students often use sources which are nonacademic and/or not appropriate to support their ideas in writing and speaking. There are many systematic errors in citation and referencing however there is evidence of an understanding of some of the conventions of citation and referencing. Students often have difficulty comprehending and interpreting texts, sometimes failing to understand the main ideas and writer's views and attitudes. Written language is often inaccurate containing errors in a range of simple and complex grammar and vocabulary. Spoken language is only sometimes comprehensible and fluent, and strain is frequently placed on the listener.				
	Fail					
Course Type	Lecture-b	pased course				
Course Teaching	Activitie	98	Details		No. of Hours	
& Learning Activities	Lectures	3			30	
	Tutorials	3			6	
	Reading	/ Self study			84	
Assessment Methods and Weighting	Method	s	Details		Veighting in fina course grade (%)	
	Examina	ation			25	
					35	

CAES9820 Academic Engli	ish for scie	ence students (6 credits)		Academic Year	2014	
Offering Department	English			Quota		
Course Co-ordinator	Mr S Boyn	iton, English (sboynton@hku.hk)				
Teachers Involved	Mr S Boyn	ton, Centre for Applied English Studie	S			
Course Objectives	Science F spoken Er general a audience.	This six credit English-in-the-Discipine course will be offered to second year students studying in the Science Faculty. This course will help students develop the necessary skills to use both written and spoken English within their studies. Students will learn to better communicate and spontaneously discuss general and scientific concepts within their division, with other scientists as well as to a larger audience. Particular emphasis will be placed on enabling students to identify their own language needs and develop appropriate self-learning strategies to improve their proficiency.				
Course Contents & Topics	<ul> <li>Finding,</li> <li>Compiling</li> <li>Contrasti</li> <li>Writing for</li> <li>Organizing</li> <li>grammar;</li> <li>Critically</li> </ul>	Topics covered in the course will be: - Finding, evaluating and using appropriate academic source materials; - Compiling an academic bibliography; - Contrasting academic and popular genres; - Writing for a specific audience, including stance, shared knowledge, levels of formality; - Organizing and articulating ideas in an academically suitable format including appropriate vocabulary and grammar; and - Critically examine their own language proficiency and analyze how that relates to their ability to perform successfully within their discipline. Developing self-directed learning strategies.				
Course Learning Outcomes	On succes	ssful completion of this course, student	ts should be able to:			
	Production     disciplinary	I. Identify and summarize disciplinary sources related to a specified topic.     Produce texts (written and spoken) appropriate for a cross-disciplinary audience based on their disciplinary knowledge.     Identify their own language learning needs and implement a plan to meet those needs.				
Pre-requisites (and Co-requisites and Impermissible combination)	NIL	NIL				
Offer in 2014 - 2015	Y 1st	sem 2nd sem		Examination	Dec May	
Offer in 2015 - 2016	Υ					
Course Grade	A+ to F					
Grade Descriptors	В	reliable sources using original language. Text uses sources appropriately and demonstrates accurate and appropriate grammatical, lexical and organizational characteristics. Language learning needs are clearly identified and aligned with evidence of planning, self-study and reflection.				
	С	Satisfactory to reasonably good result. Demonstrates some ability to summarize salient points using mostly original language although some inaccuracies are present. Text uses some sources appropriately and demonstrates appropriate but simple grammatical and lexical characteristics with some organizational flaws. Language learning needs are stated with some limited evidence of planning and reflection but goals and self-study are misaligned.				
	D	Barely satisfactory result. Demonstrates a limited ability to summarize salient points from sources with inaccuracy and little original language. Text uses sources inappropriately and demonstrates grammatical inaccuracy inappropriate lexical choices and organizational flaws. There is a minimal statement of language learning nee planning and reflection with little or no apparent alignment between goals and self-study.			matical inaccuracy,	
	Fail  Unsatisfactory result. Does not demonstrate ability to summarize salient points identify, interpret or appropriately paraphrase reliable sources. Text uses no sources and demonstrates serious grammatical, lexical and/or organizational errors. Does not demonstrate any meaningful attempt to identify language learning needs or implement a plan.					
Course Type	Lecture-ba	ased course				
Course Teaching	Activities	3	Details		No. of Hours	
& Learning Activities	Tutorials		seminars		36	
	Reading /	Self study			120	
	Assessm	ent	independent learni	ng work	84	
Assessment Methods and Weighting	Methods		Details		Veighting in final course grade (%)	
	Test				30	
	Assignme	ents	independent learni	ng work	25	
	Essay		other genres of writ	ting	45	
Required/recommended reading and online materials	Course ma	aterials to be provided electronically th	rough course website	•		
reading		hku.hk/caes9820/	Todgii oodioo wobollo			

T CHEIIIISH y	(6 credits)		Academic Year	2014
Chemistry			Quota	150
Dr A P L T	ong, Chemistry (apltong@hku.hk)			
Dr A P L T	ong, Chemistry			
are interes	ted in exploring Chemistry further, v			
Elements, properties; the mole	compounds, and mixtures; physic measuring mass, length, volume a concept and stoichiometry; solution	al properties of matte and temperature; atomi	c structure and su	batomic particles
			netry; the kinetic-m	olecular theory o
Covalent,	ionic and metallic bonds; bond energ	gy and chemical change		and bond polarity
Physical s state: stru	tates and phase changes; types o cture, properties, and bonding; ad	f intermolecular forces;	properties of liqui	
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.				
On succes	sful completion of this course, stude	ents should be able to:		
conventior 2. Demonsolids, the equilibria. 3. Demons groups of 4. Apply the predictions 5. Organiz	ns.  strate knowledge and understandir nature of gases, phase changes, custrate a basic knowledge of nomeno proganic compounds.  te theories and concepts introduced	ng of chemical stoichio hemical bonding and st lature, isomerism, and to in the course to solve p	metry, the properti tructures, and the re typical reactions of problems, perform of	es of liquids and ature of chemical various functions
	strate awareness and appreciation			in society and i
everyday I	strate awareness and appreciation ife.	of the relevant applica	tions of chemistry	
Level 3 or equivalent Students v course coo	strate awareness and appreciation ife.  r above in HKDSE Combined Scie.  vithout such background but keen optinator for consideration.	of the relevant applications of the relevant applications of the relevant application	tions of chemistry	rated Science, o
everyday I Level 3 or equivalent Students v course coo Not for stu	strate awareness and appreciation ife.  r above in HKDSE Combined Scientification without such background but keen operdinator for consideration, dents with Level 3 or above in HKDS	of the relevant applications of the relevant applications of the relevant application	omponent or Integral chemistry course in	rated Science, o
everyday I  Level 3 or equivalent Students v course coor Not for stu  Y 1st	strate awareness and appreciation ife.  r above in HKDSE Combined Scientification without such background but keen operdinator for consideration, dents with Level 3 or above in HKDS	of the relevant applications of the relevant applications of the relevant application	tions of chemistry	rated Science, o
everyday I  Level 3 or equivalent Students v course coo Not for stu  Y 1st:	strate awareness and appreciation ife.  r above in HKDSE Combined Scientification without such background but keen operdinator for consideration, dents with Level 3 or above in HKDS	of the relevant applications of the relevant applications of the relevant application	omponent or Integral chemistry course in	rated Science, o
everyday I  Level 3 or equivalent Students v course coor Not for stu  Y 1st	strate awareness and appreciation ife.  r above in HKDSE Combined Scientification without such background but keen of predinator for consideration. If the seem are seem above in HKDS seem.  Demonstrate thorough mastery at an advictourse learning outcomes. Show thorough and logical thinking, with ability to apply its properties.	of the relevant application of the relevant application of the with Chemistry contact the relevant application of the subject. Demonstrates the subject of t	emponent or Integrence of chemistry course in the course in the course in the course in the course of the course o	rated Science, o may approach the Dec  def for attaining all the al and critical abilities
everyday I  Level 3 or equivalent Students v course coo Not for stu  Y 1st:  Y  A+ to F	strate awareness and appreciation ife.  r above in HKDSE Combined Scie.  vithout such background but keen our ordinator for consideration.  dents with Level 3 or above in HKDS sem  Demonstrate thorough mastery at an advacourse learning outcomes. Show thorough	of the relevant application of the relevant application of the with Chemistry of the taking this foundation of the Chemistry.  SE Chemistry.  Senced level of extensive known grasp of the subject. Democracy of the subject of the subject of the subject of the subject of the subject. Democracy of the subject	emponent or Integrate chemistry course in the course in th	rated Science, o may approach the Dec ed for attaining all the all and critical abilities unfamiliar situations ining at least most of analytical and critical an
everyday I  Level 3 or equivalent Students v course coo Not for stu  Y 1st :  Y  A+ to F	strate awareness and appreciation ife.  r above in HKDSE Combined Scientification without such background but keen of preciation of the second	of the relevant application of the relevant application. The control of the subject of the subje	emponent or Integral chemistry course in the	rated Science, o may approach the Dec Dec ed for attaining all the all and critical abilities unfamiliar situations. Apply effective g most of the course of some analytical and critical attorns. Apply effective g most of the course of some analytical and critical attorns.
everyday I  Level 3 or equivalent Students v course coo Not for stu  Y 1st :  Y  A+ to F  A	strate awareness and appreciation ife.  r above in HKDSE Combined Scie.  vithout such background but keen of ordinator for consideration.  dents with Level 3 or above in HKDS sem  Demonstrate thorough mastery at an advictourse learning outcomes. Show thoroug and logical thinking, with ability to apply I Apply highly effective organizational and p Demonstrate substantial command of a big the course learning outcomes. Show subsabilities and logical thinking, and ability to organizational and presentational skills.  Demonstrate general but incomplete comelarning outcomes. Show general but inconcritical abilities and logical thinking, and critical abilities and logical thinking, and	of the relevant application of the relevant application. The control of the subject of the subje	chemistry course in the course	rated Science, or may approach the Dec  ad for attaining all the al and critical abilities unfamiliar situations. Apply effective g most of the course of some analytical and critical ations. Apply moderately for the course learning subject. Demonstrate Show limited ability to
everyday I  Level 3 or equivalent Students v course coor Not for stury 1 st start of the start o	strate awareness and appreciation ife.  If above in HKDSE Combined Scientistic and preciation or above in HKDSE Combined Scientistic and preciation. The strategy and the strategy are also and the strategy and together and the strategy and together and	of the relevant application of the with Chemistry or the taking this foundation of the taking this foundation of the taking this foundation of the subject. Demonstrated by the subject of	emponent or Integrate chemistry course in the course in th	rated Science, or may approach the Dec  ed for attaining all the all and critical abilities unfamiliar situations. Apply effective grows analytical and critical ations. Apply effective grows of some analytical and some analytical an
everyday I  Level 3 or equivalent Students v course coor Not for stury 1 st start of A  B  C  D  Fail	strate awareness and appreciation ife.  r above in HKDSE Combined Scientification in the second production of the second product of	of the relevant application of the with Chemistry or the taking this foundation of the taking this foundation of the taking this foundation of the subject. Demonstrated by the subject of	emponent or Integrate chemistry course in the course in th	rated Science, or may approach the Dec  and for attaining all the all and critical abilities unfamiliar situations. Apply effective grows analytical and critical actions. Apply effective grows of the course of some analytical and some analytical some analytical some analytical and some analytical some analytical some analytical and the course learning subject. Demonstrate Show limited ability to attorn a some analytical so
everyday I  Level 3 or equivalent Students v course coor Not for stury 1 st start of A  B  C  D  Fail	strate awareness and appreciation life.  r above in HKDSE Combined Scientification above in HKDSE Combined Scientification.  r above in HKDSE Combined Scientification and processes are seen and account of the consideration. It is a seen and the course learning outcomes. Show thoroug and logical thinking, with ability to apply highly effective organizational and pomonstrate substantial command of a bin the course learning outcomes. Show subsabilities and logical thinking, and ability to organizational and presentational skills.  Demonstrate general but incomplete complearning outcomes. Show general but incontricted abilities and logical thinking, and effective organizational and presentational Demonstrate partial but limited command outcomes. Show partial but limited grasp, evidence of some coherent and logical thin apply knowledge to solve problems. Apply Demonstrate little or no evidence of comoutcomes. Show evidence of little or no gand critical abilities, logical and coherent to Organization and presentational skills are used to course.	of the relevant application of the with Chemistry or the taking this foundation of the taking this foundation of the taking this foundation of the subject. Demonstrated by the subject of	emponent or Integrate chemistry course in the course in th	rated Science, o may approach the Dec Dec ed for attaining all the all and critical abilities unfamiliar situations. Apply effective g most of the course of some analytical and critical actions. Apply moderately of the course learning subject. Demonstrate Show limited ability to attornal skills.
everyday I  Level 3 or equivalent Students v course coor Not for stury 1 st sty  A+ to F  A  B  C  D  Fail	strate awareness and appreciation life.  r above in HKDSE Combined Scientification above in HKDSE Combined Scientification.  r above in HKDSE Combined Scientification and processes are seen and account of the consideration. It is a seen and the course learning outcomes. Show thoroug and logical thinking, with ability to apply highly effective organizational and pomonstrate substantial command of a bin the course learning outcomes. Show subsabilities and logical thinking, and ability to organizational and presentational skills.  Demonstrate general but incomplete complearning outcomes. Show general but incontricted abilities and logical thinking, and effective organizational and presentational Demonstrate partial but limited command outcomes. Show partial but limited grasp, evidence of some coherent and logical thin apply knowledge to solve problems. Apply Demonstrate little or no evidence of comoutcomes. Show evidence of little or no gand critical abilities, logical and coherent to Organization and presentational skills are used to course.	of the relevant application of the with Chemistry or the taking this foundation of the subject. Demotively the taking the taking of the subject. Demotively the taking of the subject. Demotively the taking of the subject. It is apply knowledge to familiar a taking of the subject. It is ability to apply knowledge to sability to apply knowledge to sability to apply knowledge to skills.  The taking of the subject of the subject of the subject of the subject. It is ability to apply knowledge to skills of the world the taking, but with limited analytic limited or barely effective organization of knowledge and skills apply the knowledge and uninking. Show very little or no minimally effective or ineffective organization.	emponent or Integrate chemistry course in the course in th	rated Science, o may approach the Dec Dec Dec Dec Dec Dec Dec Dec Dec De
	Dr A P L T Dr A P L T The course are interest and conce Topic 1: C Elements, properties; the mole significant Topic 2: G Gas press gases.  Topic 3: C Covalent, Lewis structeramic m Topic 4: Ir Physical s state: structeramic m Topic 5: C The equilibriand reactive Topic 6: In Homologo On success 1. Demonst conventior 2. Demonsoilds, the equilibria. 3. Demons groups of 4. Apply the predictions	Dr A P L Tong, Chemistry (apltong@hku.hk)  Dr A P L Tong, Chemistry  The course aims to provide students who do nare interested in exploring Chemistry further, wand concepts of chemistry.  Topic 1: Chemistry: Matter and Measurement Elements, compounds, and mixtures; physic properties; measuring mass, length, volume at the mole concept and stoichiometry; solutio significant figures.  Topic 2: Gases: Their Properties and Behavior Gas pressure; the gas laws; the ideal gas law gases.  Topic 3: Chemical Bonding and Structures (7 Covalent, ionic and metallic bonds; bond energ Lewis structures of molecules and ions; VSEP  Topic 4: Intermolecular Forces: Liquids, Solids Physical states and phase changes; types o state: structure, properties, and bonding; adceramic materials and polymeric materials.  Topic 5: Chemical Equilibrium (4 hours) The equilibrium state and the equilibrium cons and reaction quotient; Le Chelier? Principle  Topic 6: Introductory Organic Chemistry (9 hot Homologous series and nomenclature; isomerion successful completion of this course, stude 1. Demostrate knowledge and understanding conventions.  2. Demonstrate knowledge and understanding conventions.  2. Demonstrate knowledge and understanding conventions.  3. Demonstrate a basic knowledge of nomenc groups of organic compounds.  4. Apply the theories and concepts introduced predictions and rationalize trends.	Dr A P L Tong, Chemistry (apltong@hku.hk)  Dr A P L Tong, Chemistry  The course aims to provide students who do not have HKDSE Chemiare interested in exploring Chemistry further, with an understanding of and concepts of chemistry.  Topic 1: Chemistry: Matter and Measurement (2 hours) Elements, compounds, and mixtures; physical properties of matte properties; measuring mass, length, volume and temperature; atomithe mole concept and stoichiometry; solutions and concentrations significant figures.  Topic 2: Gases: Their Properties and Behaviour (6 hours) Gas pressure; the gas laws; the ideal gas law and reaction stiochion gases.  Topic 3: Chemical Bonding and Structures (7 hours) Covalent, ionic and metallic bonds; bond energy and chemical change Lewis structures of molecules and ions; VSEPR Theory and molecula  Topic 4: Intermolecular Forces: Liquids, Solids, and Phase Changes Physical states and phase changes; types of intermolecular forces; state: structure, properties, and bonding; advanced materials e.g. ceramic materials and polymeric materials.  Topic 5: Chemical Equilibrium (4 hours) The equilibrium state and the equilibrium constant; the equilibrium law and reaction quotient; Le Chelier? Principle  Topic 6: Introductory Organic Chemistry (9 hours) Homologous series and nomenclature; isomerism; typical reactions of On successful completion of this course, students should be able to:  1. Demostrate knowledge and understanding in relation to some checonventions.  2. Demonstrate knowledge and understanding of chemical stoichio solids, the nature of gases, phase changes, chemical bonding and stequilibria.  3. Demonstrate a basic knowledge of nomenclature, isomerism, and igroups of organic compounds.  4. Apply the theories and concepts introduced in the course to solve predictions and rationalize trends.	Dr A P L Tong, Chemistry (apltong @hku.hk)  Dr A P L Tong, Chemistry  The course aims to provide students who do not have HKDSE Chemistry or an equivale are interested in exploring Chemistry further, with an understanding of the essential fund and concepts of chemistry.  Topic 1: Chemistry: Matter and Measurement (2 hours)  Elements, compounds, and mixtures; physical properties of matter; chemical chang properties; measuring mass, length, volume and temperature; atomic structure and su the mole concept and stoichiometry; solutions and concentrations; uncertainty in m significant figures.  Topic 2: Gases: Their Properties and Behaviour (6 hours)  Gas pressure; the gas laws; the ideal gas law and reaction stiochiometry; the kinetic-m gases.  Topic 3: Chemical Bonding and Structures (7 hours)  Covalent, ionic and metallic bonds; bond energy and chemical change; electronegativity Lewis structures of molecules and ions; VSEPR Theory and molecular shape.  Topic 4: Intermolecular Forces: Liquids, Solids, and Phase Changes (8 hours)  Physical states and phase changes; types of intermolecular forces; properties of liquistate: structure, properties, and bonding; advanced materials e.g. electronic material ceramic materials and polymeric materials.  Topic 5: Chemical Equilibrium (4 hours)  The equilibrium state and the equilibrium constant; the equilibrium law: calculation of equand reaction quotient; Le Chelier? Principle  Topic 6: Introductory Organic Chemistry (9 hours)  Homologous series and nomenclature; isomerism, typical reactions of selected functiona  On successful completion of this course, students should be able to:  1. Demostrate knowledge and understanding in relation to some chemical vocabulary conventions.  2. Demonstrate knowledge and understanding of chemical stoichiometry, the propertis solids, the nature of gases, phase changes, chemical bonding and structures, and the requilibria.  3. Demonstrate a basic knowledge of nomenclature, isomerism, and typical reactions of groups of organic compounds.  4. Ap

	Reading / Self study		100		
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)		
	Assignments		20		
	Examination		65		
	Test		15		
Required/recommended reading and online materials	1) Petrucci; Herring; Madura; Bissonnette: General Chemistry: Principles and Modern Applications, late 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	Suggested follow-up course: CHEM10	42 General Chemistry			

CHEM1042 General chemi	istry (6 credi	its)	Academic Year	2014	
Offering Department	Chemistry		Quota	260	
Course Co-ordinator	Dr A P L To	ong, Chemistry (apltong@hku.hk)			
Teachers Involved	Dr A P L To	ong, Chemistry			
Course Objectives	chemistry. including vo some basic	e aims to provide students with a solid foundati It also provides students with hands-on training plumetric analysis, preparation, purification and of a instrumental methods. Students will be equipped owledge and skills for further studies in Chemistry	g of basic laboratory skills characterization of chemica ed with a good foundation	and technique I substances an	
Course Contents & Topics  Course Learning Outcomes	elements a subatomic measureme Atoms: the of the hydro atomic orbi ionization e Chemical b molecular s Energetics spontaneity integrated r Solutions a solubility. Acid-Base ionization c solutions; a	its nature and method: physical properties; of and compounds; measuring mass, length, volur particles; the mole concept and stoichiometry; and and significant figures. quantum world: electromagnetic radiation and matogen atom; the quantum mechanical model of the tals; shapes of atomic orbitals; electron configurationergies, and electron affinities. Bonding and structures: review on covalent, ion tructures (VSEPR, VB theory, MO theory). and kinetics of reactions: heat and work; the first of changes. Reaction rate; factors that influentate laws; temperature and reaction rate; reaction rate have; temperature and reaction rate; reaction rate and their properties: solutions; energy changes equilibria: acid-base concepts; equilibria in soliconstants; molecular properties and acid strength; cid-base titrations.	me and temperature; atom solutions and concentration tter; Planck's quantum theoretom; quantum numbers, etions; periodic trends: atomic and metallic bond. Cover the solution rate; rate laws mechanisms; catalysis. and the solution process; utions of weak acids and acid-base properties of sample solution to the solution process; and the solution process; a	nic structure and s; uncertainty in the Bohr modernergy levels, and c radii, ionic radii radent bonds and theat of reactions differential and factors affecting in weak bases it solutions; buffer	
Pre-requisites	concepts of 2. Demonst well as aqu 3. Apply the predictions 4. Carry ou and interpre 5. Organize 6. Demons everyday lif	trate a basic knowledge and understanding of the chemical bonding and their relationships with the trate knowledge and understanding in relation to eous equilibria including acid-base equilibria. The theories and concepts introduced in the course the and rationalize trends. It chemical experiments with proper procedures, rest and evaluate the experimental data. It and present chemical ideas in a clear, logical and trate awareness and appreciation of the relevance.  above in HKDSE Chemistry or equivalent; sturing the studies of the chemical trates are supported to the course of the co	bulk properties of matter. thermodynamics and kinetic o solve problems, perform of ecord experimental oberserved d coherent way. t applications of chemistry	cs of reactions a calculations, mak vations accurately in society and i	
(and Co-requisites and Impermissible combination)		out having a pass in CHEM1041 Foundations of ch			
Offer in 2014 - 2015	Y 1st s	em 2nd sem	Examination	Dec May	
Offer in 2015 - 2016	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 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. Show 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 substantial grasp of the subject. Demonstrate evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Show effective lab skills and techniques. Apply effective organizational and presentational skills.				
	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 outcomes. Show partial but limited grasp, with retention of sevidence of some coherent and logical thinking, but with limit apply knowledge to solve problems. Demonstrate partially ef	some relevant information, of the ted analytical and critical abilities.	subject. Demonstrate Show limited ability t	

		effective organizational and presentati	onal skills.		
	Fail	Demonstrate little or no evidence of command of knowledge and skills required for attaining the outcomes. Show evidence of little or no grasp of the knowledge and understanding of the subject. La and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to some defencion or ineffective or ineffective lab skills and techniques. Organization and presental minimally effective or ineffective.			
Course Type	Lecture with laboratory component course				
Course Teaching & Learning Activities	Activities	S	Details	No. of Hours	
	Lectures			24	
	Laborato	ry		24	
	Tutorials			6	
	Reading / Self study			100	
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	
	Examinat	ion		60	
	Laboratory reports			25	
	Test			15	
Required/recommended reading and online materials	edition, Pe	) Petrucci; Herring; Madura; Bissonnette: General Chemistry: Principles and Modern Applications, late 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 pass this o		nts must complete ALL expe	riments and laboratory reports to	

CHEM2041 Principles of c	hemistry (	6 credits)	Academic Year	2014		
Offering Department	Chemistr	y	Quota	280		
Course Co-ordinator	Dr I K Ch	u, Chemistry (ivankchu@hku.hk)				
Teachers Involved		Yuen, Chemistry u, Chemistry				
Course Objectives	This cour	This course is designed for non-chemistry major students covering basic principles of chemistry.				
Course Contents & Topics	Thermody capacities entropy, of Transport conductic Chemical measurer Chemical Equilibria chemical Introducti diprotic a Introducti identificati	Kinetics: rate of reactions, orders of reactions, rate ment of reaction rates, enzyme kinetics, enzyme inhibit Equilibrium; in single-, and two component systems: phase transi potential; liquid/liquid systems; on to acids and bases: calculation on concentration of polyprotic acids, activity; on to Spectroscopy: UV/Visible absorption spectroscotion of functional groups; NMR Spectroscopy, Larmor coupling multiplicities; Mass Spectrometry, isotopic	second and third laws of action; in liquids and viscosity laws, reaction mechanision, temperature effect on tions, phase diagrams and different chemical specipy, Beer-Lambert Law; I frequency & chemical sh	of liquids, ioni im, experimenta rates; d the phase rule ies in a solution R Spectroscopy ift, peak integra		
Course Learning Outcomes	Explai     properties	essful completion of this course, students should be ab- in the principles of the thermochemistry, chemical is of solutions and gases. In the principles of the spectroscopy, and spectrometry.	kinetics, chemical equil	ibrium, physica		
Pre-requisites (and Co-requisites and Impermissible combination)	Not for so course; a	tudents who have passed in CHEM2441 Organic ch nd tudents who have passed in CHEM2541 Physical ch	emistry I or have already	enrolled in the		
Offer in 2014 - 2015	N		Examination			
Offer in 2015 - 2016	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.				
	С	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.				
	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.					
	Fail	principles and theories relating to the spectroscopy for chemical analysis.	e modern chemistry, instrumentations Show little or no evidence of abilities	rstanding of essential facts, concepts, s and applications of spectrometry and to apply and integrate knowledge and tions related to general chemistry and		
Course Type	Lecture-b	ased 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	<b>S</b>	Details	Weighting in final course grade (%)		
	Assignments			25		
	Examination			75		
Required/recommended reading and online materials	Spectroso	copy for the biological science, by	Gordon G. Hammes, Wiley-In	terscience (2005)		

CHEM2042 Principles of c	hemistry	for pharmacy students (6 credits)	Academic Year	2014		
Offering Department	Chemisti	ry	Quota	30		
Course Co-ordinator	Dr A M Y	Yuen, Chemistry (maiyan@hku.hk)				
Teachers Involved	Dr A M Y	Yuen, Chemistry				
Course Objectives	This cou	rse is designed to introduce basic principles of chemistry	to Bachelor of Pharmacy	/ students.		
Course Contents & Topics	Chemica mechani in pharm Chemica Acids an acids, ac Basic S	Gas Laws, thermodynamics, physical properties of liquid and gases; Chemical Kinetics: rate of reactions, effect of temperature, orders of reactions, rate laws, reaction mechanism, experimental measurement of reaction rates, enzyme kinetics, enzyme inhibition; application in pharmacokinetics Chemical Equilibrium; Acids and bases: pH values in aqueous solution, importance in biological systems, diprotic and polyproacids, activity; Basic Spectroscopy and Spectrometry Techniques and their applications: UV/Visible absorption spectroscopy; NMR spectroscopy; Mass Spectrometry.				
Course Learning Outcomes	1. Demo chemical sciences 2. Demo	On successful completion of this course, students should be able to:  1. Demonstrate knowledge and understanding of basic principles of thermochemistry, chemical kinetic chemical equilibrium, physical properties of solutions and gases that are essential to pharmaceutic sciences.  2. Demonstrate knowledge and understanding principles and of spectroscopy and spectrometry and the applications in pharmaceutical sciences.				
Pre-requisites (and Co-requisites and Impermissible combination)	Not for s	CHEM1042 General chemistry; and tudents who have passed in CHEM2041 Prinicples of ch urse is for BPharm students only)	emistry, or already enroll	ed in this cours		
Offer in 2014 - 2015	N		Examination			
Offer in 2015 - 2016	N					
Course Grade	A+ to F					
Grade Descriptors	A	Demonstrate thorough knowledge and understanding of essentia the modern chemistry, instrumentations and applications of spe Show strong ability to apply and integrate knowledge and theory general chemistry and spectroscopy.	ctrometry and spectroscopy for	r chemical analysis		
	В	, , , , ,				
	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.					
	C	principles and theories relating to the modern chemistry, instru spectroscopy for chemical analysis. Show evidence of some abil	lities to apply and integrate kno			
	D	principles and theories relating to the modern chemistry, instru spectroscopy for chemical analysis. Show evidence of some abil	ities to apply and integrate knownistry and spectroscopy.  derstanding of essential facts, and applications of spectrometry and integrate knowledge and	concepts, principle y and spectroscop theory, and limite		

	theory, and little or no abili spectroscopy.	ty to analyze problems to most familiar situation	ns related to general chemistry and		
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 (%)		
	Assignments	including test	25		
	Examination		75		
Required/recommended reading and online materials	Spectroscopy for the biological scie	nce, by Gordon G. Hammes, Wiley-Inter	rscience (2005)		

CHEM2241 Analytical che	mistry i (6	redits) Acade	demic Year	2014	
Offering Department	Chemistry	Quota	ta	100	
Course Co-ordinator	Dr W T Cl	n, Chemistry (wtchan@hku.hk)			
Teachers Involved	Dr W T Cl	an, Chemistry			
Course Objectives	measuren will be dis and stoic	e aims to introduce the basic principles of chemical analysis. ent, including error analysis, quality assurance and calibration, darnussed with reference to methods of chemical analysis that are beometric reactions. The laboratory classes will include experiment of data acquisition and processing as well as chemical analysis.	ata acquisition based on che ments demon	and processing mical equilibrium strating modern	
Course Contents & Topics	Measurement: analog and digital measurement, accuracy and precision, comparing means ar calibration curves and least square method for linear plots			s and deviations	
	Quality as	urance: validation of analytical procedures			
		quilibrium and chemical analysis: aqueous solution and chemica vity, complexation reactivity, precipitation reactivity	al equilibrium;	analysis by acid	
Course Learning Outcomes	Explain     Explair     and precipant	On succesful completion of this course, students should be able to:  1. Explain the basic principles of chemical measurements.  2. Explain the principles of classical methods of chemical analysis including neutralization, complexatio and precipitation titrimetry.  3. Use laboratory apparatus for chemical analysis.			
Pre-requisites	Pass in CHEM1042 General chemistry				
mpermissible combination)	Y 1st	em 2nd sem Exam	nination	Dec May	
mpermissible combination) Offer in 2014 - 2015	Y 1st	em 2nd sem Exam	mination	Dec May	
mpermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016		em 2nd sem Exam	nination	Dec May	
Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade	Υ	Demonstrate thorough grasp of the subject. Show evidence of strong analytic thinking, and ablility to apply knowledge to a wide range of complex, familiar an highly proficient lab skills and techniques and critical use of data and results conclusions. Demonstrate highly effective organization and presentation skills.	ical abilities, logic and unfamiliar situ	cal and independent ations. Demonstrate	
Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade	Y A+ to F	Demonstrate thorough grasp of the subject. Show evidence of strong analytic thinking, and ablility to apply knowledge to a wide range of complex, familiar an highly proficient lab skills and techniques and critical use of data and results	ical abilities, logiond unfamiliar situts to draw approabilities and logiliar and some u	cal and independent ations. Demonstrate priate and insightful ical thinking, some nfamiliar situations.	
Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade	Y A+ to F	Demonstrate thorough grasp of the subject. Show evidence of strong analytic thinking, and ability to apply knowledge to a wide range of complex, familiar an highly proficient lab skills and techniques and critical use of data and results conclusions. Demonstrate highly effective organization and presentation skills.  Demonstrate substantial grasp of the subject. Show evidence of analytical a evidence of independent thinking, and ability to apply knowledge to familia Demonstrate proficient lab skills and techniques and correct use of data and rest	ical abilities, logic and unfamiliar situ ts to draw appro abilities and log liar and some u sults to draw app f some analytical byledge to most erroneous use o	cal and independent ations. Demonstrate priate and insightful ical thinking, some nfamiliar situations. ropriate conclusions. abilities and logical familiar situations. f data and results to	
(and Co-requisites and Impermissible combination)  Offer in 2014 - 2015  Offer in 2015 - 2016  Course Grade  Grade Descriptors	Y A+ to F A B	Demonstrate thorough grasp of the subject. Show evidence of strong analytic thinking, and ability to apply knowledge to a wide range of complex, familiar an highly proficient lab skills and techniques and critical use of data and results conclusions. Demonstrate highly effective organization and presentation skills.  Demonstrate substantial grasp of the subject. Show evidence of analytical a evidence of independent thinking, and ability to apply knowledge to familia Demonstrate proficient lab skills and techniques and correct use of data and results of the subject. Show evidence of thinking, little evidence of independent thinking, and ability to apply knowledge to appl	ical abilities, logic and unfamiliar situ ts to draw appro abilities and log liar and some usults to draw app f some analytical swledge to most erroneous use o and presentation sition, of the subject tied ability to use data	cal and independent ations. Demonstrate priate and insightful iical thinking, some nfamiliar situations. ropriate conclusions.  abilities and logical familiar situations. f data and results to kitils.  tt. Show evidence of y knowledge to solve a and results to draw	
Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade	Y A+ to F A B C	Demonstrate thorough grasp of the subject. Show evidence of strong analytic thinking, and ablility to apply knowledge to a wide range of complex, familiar an highly proficient lab skills and techniques and critical use of data and results conclusions. Demonstrate highly effective organization and presentation skills. Demonstrate substantial grasp of the subject. Show evidence of analytical a evidence of independent thinking, and ability to apply knowledge to familia Demonstrate proficient lab skills and techniques and correct use of data and results of the strong proficient lab skills and techniques and correct use of data and results of thinking, little evidence of independent thinking, and ability to apply known Demonstrate adequate lab skills and techniques and mostly correct but some of draw appropriate conclusions. Demonstrate moderately effective organization and Demonstrate partial but limited grasp, with retention of some relevant informatic limited analytical abilities, little or no evidence of independent thinking, and limited problems. Demonstrate partially effective lab skills and techniques and limited l	ical abilities, logicand unfamiliar situsts to draw appro abilities and logiliar and some usults to draw app f some analytical swledge to most erroneous use o and presentation sition, of the subject ted ability to use data nd presentation si subject. Show littly to apply ability to apply apply actions.	cal and independent ations. Demonstrate priate and insightful ical thinking, some nfamiliar situations. repriate conclusions.  abilities and logical familiar situations. If data and results to kills.  at. Show evidence of y knowledge to solve and results to draw kills.  er or no evidence of knowledge to solve of data and results to solve of data and results.	
Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade Grade Descriptors	Y A+ to F A B C D Fail	Demonstrate thorough grasp of the subject. Show evidence of strong analytic thinking, and ability to apply knowledge to a wide range of complex, familiar an highly proficient lab skills and techniques and critical use of data and results conclusions. Demonstrate highly effective organization and presentation skills.  Demonstrate substantial grasp of the subject. Show evidence of analytical a evidence of independent thinking, and ability to apply knowledge to familia Demonstrate proficient lab skills and techniques and correct use of data and results of the subject organization and presentation skills.  Demonstrate effective organization and presentation skills.  Demonstrate general but incomplete grasp of the subject. Show evidence of thinking, little evidence of independent thinking, and ability to apply knowledge appropriate conclusions. Demonstrate moderately effective organization and Demonstrate partial but limited grasp, with retention of some relevant informatic limited analytical abilities, little or no evidence of independent thinking, and limited a appropriate conclusions. Demonstrate limited or barely effective organization and Demonstrate little or no grasp of the knowledge and understanding of the sul analytical abilities, logical and independent thinking, and very little or no a problems. Demonstrate minimally effective or ineffective lab skills and technique.	ical abilities, logicand unfamiliar situsts to draw appro abilities and logiliar and some usults to draw app f some analytical swledge to most erroneous use o and presentation sition, of the subject ted ability to use data nd presentation si subject. Show littly to apply ability to apply apply actions.	cal and independent ations. Demonstrate priate and insightful ical thinking, some nfamiliar situations. repriate conclusions.  abilities and logical familiar situations. If data and results to kills.  at. Show evidence of y knowledge to solve and results to draw kills.  er or no evidence of knowledge to solve of data and results to solve of data and results.	
Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade Grade Descriptors  Course Type Course Teaching	Y A+ to F A B C D Fail	Demonstrate thorough grasp of the subject. Show evidence of strong analytic thinking, and ability to apply knowledge to a wide range of complex, familiar an highly proficient lab skills and techniques and critical use of data and results conclusions. Demonstrate highly effective organization and presentation skills.  Demonstrate substantial grasp of the subject. Show evidence of analytical a evidence of independent thinking, and ability to apply knowledge to familiar Demonstrate proficient lab skills and techniques and correct use of data and rest Demonstrate effective organization and presentation skills.  Demonstrate general but incomplete grasp of the subject. Show evidence of thinking, little evidence of independent thinking, and ability to apply know Demonstrate adequate lab skills and techniques and mostly correct but some edraw appropriate conclusions. Demonstrate moderately effective organization and Demonstrate partial but limited grasp, with retention of some relevant informatic limited analytical abilities, little or no evidence of independent thinking, and limite problems. Demonstrate partially effective lab skills and techniques and mostrate partially effective lab skills and technique appropriate conclusions. Demonstrate limited or barely effective organization and Demonstrate little or no grasp of the knowledge and understanding of the sul analytical abilities, logical and independent thinking, and very little or no a problems. Demonstrate minimally effective or ineffective lab skills and technique and/or unable to draw appropriate conclusions. Demonstrate incherent organization.	ical abilities, logicand unfamiliar situsts to draw appro abilities and logiliar and some usults to draw app f some analytical swledge to most erroneous use o and presentation sition, of the subject ted ability to use data nd presentation si subject. Show littly to apply ability to apply apply actions.	cal and independent ations. Demonstrate priate and insightful ical thinking, some nfamiliar situations. repriate conclusions.  abilities and logical familiar situations. If data and results to kills.  at. Show evidence of y knowledge to solve and results to draw kills.  er or no evidence of knowledge to solve of data and results to solve of data and results.	
Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade	Y A+ to F A B C D Fail	Demonstrate thorough grasp of the subject. Show evidence of strong analytic thinking, and ability to apply knowledge to a wide range of complex, familiar an highly proficient lab skills and techniques and critical use of data and results conclusions. Demonstrate highly effective organization and presentation skills.  Demonstrate substantial grasp of the subject. Show evidence of analytical a evidence of independent thinking, and ability to apply knowledge to familiate Demonstrate proficient lab skills and techniques and correct use of data and results of the subject of	ical abilities, logicand unfamiliar situsts to draw appro abilities and logiliar and some usults to draw app f some analytical swledge to most erroneous use o and presentation sition, of the subject ted ability to use data nd presentation si subject. Show littly to apply ability to apply apply actions.	cal and independent ations. Demonstrate priate and insightful ical thinking, some infamiliar situations. repriate conclusions.  abilities and logical familiar situations of data and results to exit is solved and results to draw cills.  at Show evidence of y knowledge to solve and results to draw cills.  are or no evidence of conveloped to solve of data and results resentation skills.	

	Tutorials		6
	Reading / Self study		100
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)
	Assignments		5
	Examination		65
	Laboratory reports		20
	Test		10
Required/recommended reading and online materials	Skoog, West, Holler and Crouch, "Fundament Learning.	tals of Analytical Chemistry", late:	st edition, Cengage
Additional Course Information	Laboratory classes are mandatory. Students mu pass this course.	ust complete ALL experiments and	laboratory reports to

CHEM2341 Inorganic chen	nistry I (6 c	redits)	Academic Year	2014	
Offering Department	Chemistry		Quota	120	
Course Co-ordinator	Prof V W	V Yam, Chemistry (wwyam@hku.hk)			
Teachers Involved		W Yam / Dr. H Y Au Yeung, Chemistry /uen, Chemistry			
Course Objectives	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	electronic redox and	concept; structure and bonding of transition mabsorption and magnetic properties of metal comsubstitution; chemistry of selected main groupance to biology and materials.	plexes; chemical reactions of	metal complexes	
Course Learning Outcomes	1. Unders selected e 2. Demon: transition transition and the th 5. Demon	On successful completion of this course, students should be able to:  1. Understand the basic principles and concepts of inorganic chemistry and appreciate their relevance selected examples of biological processes and materials science.  2. Demonstrate knowledge and understanding of the acid-base concept and definition.  3. Demonstrate knowledge and understanding of the structure and bonding of main group compounds a transition metal complexes and their relevance to the electronic absorption and magnetic properties transition metal complexes.  4. Demonstrate knowledge and understanding of the thermodynamic stability of metal complex format and the thermodynamic and kinetic aspects of substitution and redox reactions.  5. Demonstrate knowledge and understanding of the role of main group elements and transition metal complexes in bioinorganic chemistry.			
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in CHEM1042 General chemistry; and Not for students who have passed in CHEM2041 Principles of chemistry or have already enrolled in t course.				
Offer in 2014 - 2015	Y 1st	sem 2nd sem	Examination	Dec May	
Offer in 2015 - 2016	Υ				
Course Grade	A+ to F				
Grade Descriptors	В	Demonstrate thorough knowledge and understanding of e the basic foundation knowledge of inorganic chemistry, es bonding of main group compounds and metal complexes as well as thermodynamic and kinetic aspects of meta biological processes and materials science. Show strong a to the basic foundation knowledge of inorganic chemistry. use of data and experimental results to draw appropriate and knowledge of inorganic chemistry. Demonstrate highly in the synthesis and characterization of inorganic compound Demonstrate substantial command of knowledge and ur theories relating to the basic foundation knowledge of ir concept; structure and bonding of main group compounds magnetic properties as well as thermodynamic and kinetic relevance to biological processes and materials science theory relating to the basic foundation knowledge of inorganic dependences to so of the past of the page to the past of the page to the past transfer and provide the page to the pag	specially those related to acid-base or, electronic absorption spectroscopy, complexes and their reactions; an ability to apply and integrate knowled. Show strong ability to analyze novel and insightful conclusions relating to effective basic laboratory skills and that and metal complexes.  Inderstanding of essential facts, concorganic chemistry, especially those and metal complexes; electronic absist aspects of metal complexes and the . Show evidence to anion chemistry.	oncept; structure and magnetic properties definition and theory relating problems and critical of the basic principles echniques, especiall epts, principles, and related to acid-basic orption spectroscopy in reactions; and their grate knowledge and alyze novel problems.	
	and correct use of data and experimental results to draw appropriate conclusions relating to the basic principles and knowledge of inorganic chemistry. Demonstrate effective basic laboratory skills and techniques, especially in the synthesis and characterization of inorganic compounds and metal complexes.  C 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 a and theories relating to the basic foundation knowledge of concept; structure and bonding of main group compounds magnetic properties as well as thermodynamic and kinetic	inorganic chemistry, especially those and metal complexes; electronic absolute	e related to acid-bas orption spectroscopy	

	Fail	relevance to biological processes and m knowledge and theory relating to the ba analyze problems to most familiar situatic to draw appropriate conclusions relating to partially effective basic laboratory skills an compounds and metal complexes.  Demonstrate little or no evidence of comprinciples, and theories relating to the bas acid-base concept; structure and bondin spectroscopy, magnetic properties as w reactions; and their relevance to biological apply and integrate knowledge and theor little or no ability to analyze problems to to draw appropriate conclusions relating to	usic foundation knowledge of inor, ons and mostly correct but erroned to the basic principles and knowled the techniques, especially in the symmand of knowledge and under sic foundation knowledge of inorgag of main group compounds and ell as thermodynamic and kinetic all processes and materials science y relating to the basic foundation I most familiar situations and erroned to the basic principles and knowled	ganic chemistry. Show İlmited abilify to us use of data and experimental results dge of inorganic chemistry. Demonstrate nthesis and characterization of inorganic rstanding of essential facts, concepts, nic chemistry, especially those related to metal complexes; electronic absorption aspects of metal complexes and their Show little or no evidence of abilities to knowledge of inorganic chemistry. Show use of data and experimental results dge of inorganic chemistry. Demonstrate
		minimally effective basic laboratory skil inorganic compounds and metal complexe		the synthesis and characterization of
Course Type	Lecture w	vith laboratory component course		
Course Teaching	Activities		Details	No. of Hours
& Learning Activities	Lectures			24
	Laboratory			24
	Tutorials			6
	Reading / Self study			100
Assessment Methods and Weighting	Methods	S	Details	Weighting in final course grade (%)
	Assignm	ents		5
	Examination			65
	Laborato	ory reports		10
	Test			20
Required/recommended reading and online materials	P. Atkins	ton ; G. Wilkinson ; P. L. Gaus : Basid , T. Overton, J. Rourke, M. Weller University Press, 2006, 4th ed.)		
Additional Course Information	Laborator pass this	ry classes are mandatory. Students course.	must complete ALL exper	iments and laboratory reports to

CHEM2441 Organic chen	nistry I (6 cr	edits)	Academic Year	2014		
Offering Department	Chemistry		Quota	130		
Course Co-ordinator	Prof P Ch	Prof P Chiu, Chemistry (pchiu@hku.hk)				
Teachers Involved	Prof P Ch	u, Chemistry				
Course Objectives	alcohols, chemical	To introduce the physical and chemical properties of alkanes, alkenes, alkynes, alkyl halides, dienes alcohols, ethers, epoxides and organometallics, and apply this knowledge to understand and solve chemical problems. This course is the pre-requisite for continuing studies in organic chemistry (CHEM3441 Organic Chemistry II).				
Course Contents & Topics	Alkanes: Cycloalka Chirality a Alkenes: Alkynes: Alkyl halid Dienes: s Alcohols,	ructures and functional groups representations, conformation analysis nes: conformations and isomerism nd isomerism stereoisomerism, synthesis and reactions synthesis and reactions es: Mechanisms of substitutions and elimination ynthesis, properties and reactions Ethers and Epoxides: reactions etallics: synthesis and reactions	s			
Course Learning Outcomes	1. Visuali molecules 2. Recogr 3. Unders alkenes, a 4. Apply n	seful completion of this course, students should be zer and represent/draw three-dimensional, steredize, classify, and name chiral stereoisomers and stand the mechanisms, conditions and outcom lkynes, dienes, alcohols, ethers, epoxides and or seactions to the synthesis of target molecules. ate organic chemistry in the context of biochemic	ochemically correct represent diastereomers. es of the reactions of alkan ganometallic reagents.	-		
Pre-requisites (and Co-requisites and Impermissible combination)	Not for st	HEM1042 General chemistry; and udents who have passed in CHEM2041 Principle lemistry or have already enrolled in this course.	es of chemistry or CHEM244	2 Fundamental o		
Offer in 2014 - 2015	Y 1st	sem 2nd sem	Examination	Dec May		
Offer in 2015 - 2016	Y		·			
Course Grade	A+ to F					
Grade Descriptors	A	Demonstrate a thorough mastery at an advanced level pertaining to the chemical properties, reactions and me integrate knowledge and theory, and a strong ability to Demonstrate highly effective organization, understandin	echanisms of organic chemistry. Sho o analyze and solve novel organic	w a strong ability to chemistry problems.		

		chemistry experiments.			
	B Demonstrate substantial command of knowledge and understanding of essential facts and concepts pertaining to the chemical properties, reactions and mechanisms of organic chemistry. Show evidence of ability to integrate knowledge and theory, and evidence of ability to analyze and solve novel organic chemistry problems. Demonstrate effective organization, understanding, and execution of lab skills and techniques in organic chemistry experiments.				
	С	C Demonstrate a general but incomplete command of knowledge and understanding of essential facts and concepts pertaining to the chemical properties, reactions and mechanisms of organic chemistry. Show evidence of some ability to integrate knowledge and theory, and evidence of some ability to analyze novel problems. Show a mostly correct use of knowledge to solve most familiar problems. Demonstrate adequately effective organization, understanding, and execution of lab skills and techniques in organic chemistry experiments.			
	D	D Demonstrate a partial but limited command of knowledge and understanding of essential facts and concepts pertaining to the chemical properties, reactions and mechanisms of organic chemistry. Show evidence of limited ability to integrate knowledge and theory, and a limited ability to analyze novel problems. Show some correct but also erroneous use of knowledge to solve most familiar problems. Demonstrate a partially effective organization, understanding and application of lab skills and techniques in organic chemistry experiments.			
	Fail	Demonstrate little or no evidence of command of knowledge and understanding of essential facts and concepts pertaining to the chemical properties, reactions and mechanisms of organic chemistry. Show little or no evidence of ability to apply and integrate knowledge and theory, and little or no ability to analyze novel problems. Show little or no evidence of ability to solve most familiar problems. Demonstrate minimal or no organization, understanding and application of lab skills and techniques in organic chemistry experiments.			
Course Type	Lecture w	Lecture with laboratory component course			
Course Teaching & Learning Activities	Activitie	s	Details	No. of Hours	
& Learning Activities	Lectures			24	
	Laboratory			24	
	Tutorials			6	
	Reading / Self study			100	
Assessment Methods and Weighting	Methods	:	Details	Weighting in final course grade (%)	
	Assignm	ents		5	
	Examina	tion		65	
	Laborato	ry reports	Experiment & Lab report	20	
	Test		Test/Quiz	10	
Required/recommended reading and online materials	Paula Y. Bruice, "Organic Chemistry", 2011, 6th Edition, Pearson. Paula Y. Bruice, "Study Guide and Solutions Manual for Organic Chemistry" 6th Edition, Prentice Hall. J. W. Lehman, "Operational Organic Chemistry", 2009, 4th Edition, Prentice Hall.			Edition, Prentice Hall.	
Additional Course Information	Laborator pass this	y classes are mandatory. Students r course.	must complete ALL experiments a	and laboratory reports to	

CHEM2442 Fundamentals	of organic	chemistry (6 credits)	Academic Year	2014		
Offering Department	Chemistry		Quota	120		
Course Co-ordinator	Dr P H To	y, Chemistry (phtoy@hku.hk)				
Teachers Involved	Dr P H To	y, Chemistry				
Course Objectives	especially organic fu	The major objective of this course is to give the students a basic understanding of organic chemis especially in the context of daily life. This will be achieved through the introduction of the chemistry organic functional groups that form the basis of organic molecules. The concepts presented in the lectually be reinforced by a series of laboratory experiments.				
Course Contents & Topics	ketones,	The chemistry of organic functional groups such as alkenes, alkynes, alkyl halides, alcohols, aldehyd ketones, carboxylic acids and their derivatives, and amines will be discussed, as will the general conce of molecular structure, conformation and stereochemistry.				
Course Learning Outcomes	On successful completion of this course, students should be able to:  1. Demonstrate basic understanding of the structure of organic molecules. 2. Demonstrate basic understanding of the reactivity of organic molecules. 3. Appreciate how organic chemistry plays an important role in everyday life.					
Pre-requisites and Co-requisites and mpermissible combination)		HEM1042 General chemistry; and dents who have passed CHEM2441 Organic of	chemistry I or have already enro	lled in this course		
		Y 1st sem Examination Dec				
. ,	Y 1st	sem	Examination	Dec		
Offer in 2014 - 2015	Y 1st	sem	Examination	Dec		
Offer in 2014 - 2015 Offer in 2015 - 2016		sem	Examination	Dec		
Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade	Υ	Demonstrate thorough mastery at an advanced level for attaining all the course learning outcomes. Show sevidence of original thought, and ability to apply kno problems.	of extensive organic chemistry knowled	ge, and skills required		
Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade Grade Descriptors	Y A+ to F	Demonstrate thorough mastery at an advanced level for attaining all the course learning outcomes. Show sevidence of original thought, and ability to apply known and advanced to the course learning outcomes.	of extensive organic chemistry knowled strong analytical and critical abilities an wledge to a wide range of complex, farty with a broad range of knowledge, s. Show evidence of analytical and critical strongs of the control of the	ge, and skills required d logical thinking, with amiliar and unfamiliar and skills required for		

	D	the course learning outcomes. Show	mand of organic chemistry knowledge, and skills revidence of some coherent and logical thinking papply knowledge to solve problems.	s required for attaining some of , but with limited analytical and
	Fail		command of organic chemistry knowledge, and nalytical and critical abilities, logical and coheren oblems.	
Course Type	Lecture wi	th laboratory component course		
Course Teaching & Learning Activities	Activities	3	Details	No. of Hours
& Learning Activities	Lectures			24
	Laboratory			20
	Tutorials			5
	Reading / Self study			100
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)
	Examination			60
	Laboratory reports		Experiment & Lab report	15
	Test		Test/Quiz	25
Required/recommended reading and online materials	Bruice, P.	Y. Essential Organic Chemistry	(Pearson, 2010, 2nd edition)	
Additional Course Information			should take CHEM2441. ents must complete ALL experiments	and laboratory reports to

CHEM2443 Fundamentals credits)	of organic	chemistry for pharmacy studen	ts (6	Academic Year	2014	
Offering Department	Chemistry	/		Quota	60	
Course Co-ordinator	Dr P H To	oy, Chemistry (phtoy@hku.hk)		'	'	
Teachers Involved	Dr P H To	by, Chemistry				
Course Objectives	chemistry chemistry	The major objective of this course is to give pharmacy students a basic understanding of organ 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,	The chemistry of organic functional groups such as alkenes, alkynes, alkyl halides, alcohols, aldehyde ketones, carboxylic acids and their derivatives, and amines will discussed, as will the general concepts molecular structure, conformation and stereochemistry.				
Course Learning Outcomes	1. Demon 2. Demon	On successful completion of this course, students should be able to:  1. Demonstrate basic understanding of structure of organic molecules.  2. Demonstrate basic understanding of the reactivity of organic molecules.  3. Appreciate how organic chemistry plays an important role in everyday life.				
Pre-requisites (and Co-requisites and Impermissible combination)	Not for st	Pass in CHEM1042 General chemistry; and Not for students who have passed CHEM2442 Fundamentals of organic chemistry, or already enrolled this course.  (This course is for BPharm students only)				
Offer in 2014 - 2015	Y 1st	sem		Examination	Dec	
Offer in 2015 - 2016	Υ					
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.					
	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	Fail  Demonstrate little or no evidence of command of organic chemistry knowledge, and skills required for attaining course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little of ability to apply knowledge to solve problems.				
Course Type	Lecture w	rith laboratory component course				
Course Teaching	Activitie	s	Details		No. of Hour	
& Learning Activities	Lectures				24	

	Laboratory		20
	Tutorials		5
	Reading / Self study		100
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)
	Examination		60
	Laboratory reports	Experiment & Lab report	15
	Test	Test/Quiz	25
Required/recommended reading and online materials	Bruice, P.Y.: Essential Organic Che	emistry (Pearson, 2010, 2nd edition)	
Additional Course Information	Laboratory classes are mandatory pass this course.	. Students must complete ALL experiments	and laboratory reports to

CHEM2541 Physical chen	nistry I (6 credits)	Academic Year	2014			
Offering Department	Chemistry	Quota	100			
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 thermodynamics and chemical kinetics. Topics include the three laws of thermodynamics, thermodynamic properties of mixtures, solutions, chemical equilibrium, rates of chemical reactions and reaction dynamics. This course also provides training of laboratory skills and techniques: characterization of thermodynamic properties and chemical kinetics of selected chemical reactions using instrumental methods and computations. Students will gain a good foundation of knowledge and skills for further study in Physical Chemistry.					
Course Contents & Topics	Properties of Gases States of gases and the gas laws with applications.  The First Law of Thermodynamics Basic concepts of work, heat, energy, expansion work, heat enthalpy and adiabatic changes and examples in relation to					
	materials science.  The Second and Third Laws of Thermodynamics Direction of spontaneous change, entropy and the Third Law of Thermodynamics.					
	Simple Mixtures Thermodynamic description of mixtures, partial molar quantities, and chemical potentials of liquids and examples of osmosis in physiology and biochemistry. Activities of solvent, solute, regular solutions and ions in solution.					
	Chemical Equilibrium Spontaneous chemical reactions, the Gibbs energy minimum and equilibrium and example of energy conversion in biological cells. Response of equilibria to pressure, temperature.					
	Molecules in Motion Molecular motion in gases and liquids, kinetic model, collis surfaces, the rate of effusion and transport properties, con- electrolyte solutions and ion channels in biology.					
	Rates of Chemical Reactions Empirical chemical kinetics including experimental method integrated rate laws and temperature dependence of react discussion of plant photosynthesis and solar energy devices.					
	Reaction Dynamics Reactive collision theory, Transition state theory and Eyring equation. Dynamics of reactive collisions on potential energy surfaces.					
Course Learning Outcomes	On successful completion of this course, students should be able to:					
	<ol> <li>Demonstrate knowledge and understanding of the prorates of chemical reactions.</li> <li>Understand and demonstrate knowledge of the three law</li> <li>Understand and apply the concepts of chemical equilible temperature and pressure.</li> <li>Demonstrate knowledge and understanding of basic reand reactive collisions on a potential energy surface.</li> </ol>	ws of thermodynamics.  orium and the response of che	mical equilibria			
Pre-requisites (and Co-requisites and mpermissible combination)	Pass in CHEM1042 General chemistry; and Not for students who passed in CHEM2041 Principles of c	hemistry or have already enrol	led in this cours			

Offer in 2014 - 2015	Y 1st	sem 2nd sem	Ex	amination	Dec May	
Offer in 2015 - 2016	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 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. Show highly effective lab skills and techniques. 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 substantial grasp of the subject. Demonstrate evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Show effective lab skills and techniques. Apply effective organizational and presentational skills.				
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show general but incomplete grasp of the subject. Demonstrate evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Show moderately effective lab skills and techniques. Apply moderately effective loganizational 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-b	ased course				
Course Teaching	Activities		Details		No. of Hours	
& Learning Activities	Lectures				36	
	Tutorials				12	
	Reading / Self study				100	
Assessment Methods and Weighting	Methods		Details		Veighting in final course grade (%)	
	Assignments		including tests		30	
	Examina	tion			70	
Required/recommended reading and online materials	"Physical	Chemistry" by P. W. Atkins, lat	est edition			

CHEM3141 Environmental	chemistr	y (6 credits)	Academic Year	2014		
Offering Department	Chemistr	у	Quota	100		
Course Co-ordinator	Dr W T C	Dr W T Chan, Chemistry (wtchan@hku.hk)				
Teachers Involved		Dr W T Chan, Chemistry Prof A S C Cheung, Chemistry				
Course Objectives		rse introduces students to Environmental Chemistry and s involved in various environmental phenomena and pro		stand the chemica		
Course Contents & Topics	troposph Water Cl base che Organic I Energy: ( cells)	ere chemistry: atmospheric composition and behavior, of ere, air pollution hemistry: property of water, water resources and cycl emistry, oxidation-reduction chemistry, water purification pollutants: persistent organic pollutants, pesticides, toxic energy resources, fossil fuels, solar energy, nuclear en- eatment: domestic and hazardous waste treatment (land)	e, chemical quality of cology ergy, energy conversion	natural water, acid		
Course Learning Outcomes	1. Demoi 2. Descri energy p 3. Critica	essful completion of this course, students should be able nstrate knowledge on chemical principles of the various ibe the practical processes of chemistry in atmosphere roduction. Ily discuss local and global environmental issues based knowledge to analyze chemical processes involved in v	environmental phenome, water purification, was	ste treatment, and and data.		
Pre-requisites (and Co-requisites and Impermissible combination)		CHEM2041 Principles of chemistry or CHEM2341 Inol y I or CHEM2442 Fundamentals of organic chemistry or				
Offer in 2014 - 2015	Y 2n	nd sem	Examination	May		
Offer in 2015 - 2016	Υ					
Course Grade	A+ to F					
Grade Descriptors	<ul> <li>Demonstrate thorough grasp of the subject Demonstrate integration of the full range of appropriate principles, and evidence Show evidence of strong analytical abilities, logical and independent thinking, a to apply knowledge to a wide range of complex, familiar and unfamiliar situations Demonstrate highly organization and presentation skills.</li> </ul>					

	В	evidence Show evidence of analytical	subject Demonstrate general integration abilities and logical thinking, some evidence and some unfamiliar situations Demonstra	of independent thinking, and		
	С	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 organization and presentation skills.				
	D	<ul> <li>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.</li> </ul>				
	Fail	<ul> <li>- Demonstrate little or no grasp of the knowledge and understanding of the subject Demon integration of theories, principles, and evidence Show little or no evidence of analytical a independent thinking, and very little or no ability to apply knowledge to solve problems Demorganization and poor presentation skills.</li> </ul>				
Course Type	Lecture-b	pased course				
Course Teaching	Activities		Details	No. of Hours		
& Learning Activities	Lectures	;		36		
	Tutorials			12		
	Reading / Self study			100		
Assessment Methods and Weighting	Method	S	Details	Weighting in final course grade (%)		
	Assignments		(continuous assessment)	25		
	Examination			75		
Required/recommended reading and online materials		and M. Cann: Environmental Chemis ahan: Environmental Chemistry, Lew				

CHEM3142 Chemical proc		ioo ana analyoio (o oroano)					
Offering Department	Chemistry		Quota	20			
Course Co-ordinator	Prof G K \	Chan, Chemistry (hrsccky@hku.hk)					
Teachers Involved		rof G K Y Chan, Chemistry uest lecturer, Chemistry					
Course Objectives		ize with typical chemical industries important in of chemicals manufacturing and chemical products		To understand the			
Course Contents & Topics	chemical	Process flow charts, units and conversions, materials and energy balances, unit operations. Selection of the chemical processes to include variation in products, scale, and types of operation, e.g. for petrochemical ndustries, industrial gases, beverage processes, chloroalkaline manufacturing.					
Course Learning Outcomes	1. Solve b 2. Be fami	On successful completion of this course, students should be able to:  1. Solve basic problems of energy and mass balances in chemical and environmental processes.  2. Be familiarized with a few common chemical industries and chemical processes.  3. Understand some general principles of industrial practice through plant visits.					
Pre-requisites (and Co-requisites and Impermissible combination)		Pass in CHEM2041 Principles of chemistry or CHEM2341 Inorganic chemistry I or CHEM2441 Organic chemistry I or CHEM2541 Physical chemistry I					
Offer in 2014 - 2015	Y 2nd	sem	Examination	May			
Offer in 2015 - 2016	Υ						
Course Grade	A+ to F						
Grade Descriptors	A	Demonstrate thorough knowledge of industrial chemical processes and mastery of mass and energy balance skills required for attaining all of the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to solve problems in a wide range of complex, familiar and unfamiliar situations. Critical use of data and sourcing of references. Apply highly effective organizational and presentational skills.					
	В	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.					
	C Demonstrate general but incomplete knowledge of industrial chemical processes and command of balance skills required for attaining most of the course learning outcomes. Show evidence of some critical abilities and logical thinking, and ability to apply knowledge solve problems to most familiate correct but some erroneous use of data and references. Apply moderately effective of presentational skills.						
	D	balance skills required for attaining some of the course logical thinking, but with limited analytical and critical	Demonstrate partial but limited knowledge of industrial chemical processes and command of mass and energy balance skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Limited ability to use data and source references. Apply limited or barely effective organizational and presentational skills.				
	Fail	i i					

Course Type	Lecture with laboratory component	course	
Course Teaching & Learning Activities	Activities	Details	No. of Hours
& Learning Activities	Lectures		24
	Laboratory	computational laboratory	12
	Field work	1 - 2 plant visits	12
	Reading / Self study		100
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)
	Assignments	continuous assessment	30
	Examination		70
Required/recommended reading and online materials	Felder and Rousseau: Elementary	Principles of Chemical Processes	

CHEM3143 Introduction to	, materiale	onemeny (e ereane)		Academic Year	2014	
Offering Department	Chemistry Quota 100				100	
Course Co-ordinator	Prof W K Chan, Chemistry (waichan@hku.hk)					
Teachers Involved	Prof W K	Chan, Chemistry				
Course Objectives		rse provides an introduction to mains will also be introduced. This course course.				
Course Contents & Topics	polymer	Classification of materials; introduction to organic polymers: molecular weight, polymerization reaction, polymer synthesis and characterization; ceramics; semiconducting materials; applications of different materials; materials characterizations.				
Course Learning Outcomes	On succe	ssful completion of this course, studen	ts should be able to:			
	2. Unders the kinetic 3. Identify polymers 4. Demon	<ol> <li>Describe different materials classification and to explain the concept of structure/property relationship.</li> <li>Understand the concept of molecular weight distribution in polymers, and explain how it is affected by the kinetics of polymerization reactions.</li> <li>Identify examples of some important polymers, and explain how the molecular structure of these polymers affect their physical properties.</li> <li>Demonstrate knowledge in materials characterizations.</li> </ol>				
Pre-requisites (and Co-requisites and Impermissible combination)		CHEM 2341 Inorganic chemistry I or I or CHEM2041 Principles of chemistr				
Offer in 2014 - 2015	Y 1st	sem		Examination	Dec	
Offer in 2015 - 2016	Υ					
Course Grade	A+ to F					
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 applications of common polymers. Show strong ability to apply and integrate knowledge and theory relating to the synthesis and applications of materials. Show strong ability to analyze novel problems and critical use of data and 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, 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.					
	С	C 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 to most familiar situations and mostly correct but erroneous use of data and experimental results to draw appropriate conclusions relating to materials synthesis and characterization.				
	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 integrate knowledge and theory relating to the synthesis and applications of 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 materials synthesis and characterization.					
	Fail  Demonstrate little or no evidence of 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 little or no evidence of abilities to apply and integrate knowledge and theory relating to the synthesis and applications of 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 materials synthesis and characterization.					
Course Type	Lecture-b	ased course				
Course Teaching	Activitie	S	Details		No. of Hours	
& Learning Activities	Lectures				36	

	Reading / Self study		100
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)
	Assignments	(continuous assessment)	30
	Examination		70
Required/recommended reading and online materials	F. W. Billmeyer: Textbook of Polymer Sci G. Odian: Principles of Polymerizations ( M. P. Stevens: Polymer Chemistry: An In	John Wiley and Sons, 2004)	3)

CHEM3146 Principles and a techniques (6 credits)	pplication	ns of spectroscopic and analytical		Academic Year	2014	
Offering Department	Chemistry			Quota	110	
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 spectroscopic and analytical techniques. This course is a pre-requisite for the advanced chemistry courses.					
Course Contents & Topics		Absorption Spectroscopy, Nuclear Mag pectroscopy, Elemental Analysis, Molecu			ass Spectrometry,	
Course Learning Outcomes	On successful completion of this course, students should be able to:  1. Understand the basic principles and applications of IR, UV/Vis, MS and NMR spectroscopic techniques.  2. Describe and explain the terminology of IR, UV/Vis, MS and NMR spectroscopies.  3. Perform chemical structure elucidation and analysis based on UV/Vis, MS and NMR spectroscopic data.					
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in an	y CHEM2XXX level course				
Offer in 2014 - 2015	Y 2nd	sem		Examination	May	
Offer in 2015 - 2016	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, 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.				
	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-ba	ased course				
Course Teaching	Activities	s D	)etails		No. of Hours	
& Learning Activities	Lectures				36	
	Tutorials				12	
	Reading / Self study				100	
Assessment Methods and Weighting	Methods		)etails		Weighting in final course grade (%)	
	Assignments				15	
	Examination				70	
	Test (2 quizzes)			15		
Required/recommended reading and online materials	Donald L. Pavia, Gary M. Lampman, George S. Kriz: Introduction to Spectroscopy (Thomson Learning, 2001, 3rd & 4th edition) W. Kemp: Organic Spectroscopy (Macmillan, 1991, 3rd ed.)					
	Suggested follow-up course: CHEM3241					

CHEM3241 Analytical chem	Academic Year	2014			
Offering Department	Chemistry	Quota	80		
Course Co-ordinator	Dr W T Chan, Chemistry (wtchan@hku.hk)				

Teachers Involved	Dr W T Chan, Chemistry Dr I K Chu, Chemistry				
Course Objectives	To cover the basic principles and applications of chemical instrumentation. This course aims to provide working knowledge, in addition to the principles, of instruments that are commonly used in chemical laboratories.				
Course Contents & Topics	Optical methods: Beer's Law; UV-visible, infrared, and atomic spectrometry; fluorescence; atomic mass spectrometry; grating spectrometer; photon detectors and thermal detectors. Separation methods: partition; chromatography theories; high performance liquid chromatography (HPLC) and gas chromatography (GC); instrumental set up of HPLC and GC. Mass spectrometry: fundamental concept of mass spectrometry; electrospray ionization (ESI) and matrix-assisted laser desorption ionization (MALDI); time-of-flight (TOF) and quadrupole (Q) mass analyzers.				
Course Learning Outcomes	On successful completion of this course, students should be able to:  1. Explain the principles of the optical methods, separation methods, and mass spectrometry.  2. Describe the basic experimental set up and the properties of the basic components of the instruments used in the laboratory classes.  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 combination)		HEM2041 Principles of chemistry or Cations of spectroscopic techniques	CHEM2241 Anlytical chemistry I or C	HEM3146 Principles	
Offer in 2014 - 2015	Y 1st s	sem	Examination	Dec	
Offer in 2015 - 2016	Υ		I		
Course Grade	A+ to F				
Grade Descriptors	A - Demonstrate thorough grasp of the subject Show evidence of strong analytical abilities, logical and independent thinking, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations Demonstrate highly proficient lab skills and techniques and critical use of data and results to draw appropriate and insightful conclusions Demonstrate highly effective organization and presentation skills				
	В	<ul> <li>Demonstrate substantial grasp of the subject.</li> <li>Show evidence of analytical abilities and logical thinking, some evidence of independent thinking, and ability to apply knowledge to familiar and some unfamiliar situations.</li> <li>Demonstrate proficient lab skills and techniques and correct use of data and results to draw appropriate conclusions.</li> <li>Demonstrate effective organization and presentation skills.</li> </ul>			
	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	- 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	th laboratory component course			
Course Teaching & Learning Activities	Activities		Details	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 (%)	
	Assignments		including lab & test	30	
	Examination			70	
Required/recommended reading and online materials	D.A. Skoo	D.A. Skoog, F.K. Holler, S.R. Crouch: Principles of Instrumental Analysis (Thomson, latest edition). D.A. Skoog, D.M. West, F.J. Holler, and S.R. Crouch: Fundamentals of Analytical Chemistry (Thomson, latest edition)			
Additional Course Information	Laboratory classes are mandatory. Students must complete ALL experiments and laboratory reports to pass this course.				

CHEM3242 Food and water analysis (6 credits)		Academic Year	2014		
Offering Department	Chemistry Quota 50				
Course Co-ordinator	Dr K M Ng, Chemistry (kwanmng@hku.hk)	Dr K M Ng, Chemistry (kwanmng@hku.hk)			
Teachers Involved	Dr I K Chu, Chemistry Dr K M Ng, Chemistry				
Course Objectives	To cover areas in the application and new methodology development in analytical chemistry with focus on food and water analysis.				
Course Contents & Topics	Chemical Analysis in Practicing Laboratories: Use of standard methods, guidelines and standards for food and water analysis; good laboratory practice; reliability and quality issues in chemical analysis.				
	202				

	Food Analysis: Requirement of nutritional labeling; determination of food nutritional value (e.g. total protein content, sodium content); detection of food adulteration and contamination (e.g. presence of banned additives, toxins, undeclared components); recent issues and case studies in food analysis.				
	technologie		npling, pretreatment, storage of wate ed analysis of selected types of wat		
	digestion,	solid phase extraction) and instrur	application and combination of armental (e.g. GC, LC, MS) technique ysis, analysis of certified reference m	es for food and water	
Course Learning Outcomes		sful completion of this course, stude	• • •	,	
	1. Identify and determine errors and uncertainty of analytical results.     2. Apply measures taken to control quality and ensure reliability of analytical results.     3. Demonstrate a general knowledge in food and water analysis.     4. Understand issues in public health protection related to chemical analysis.     5. Carry out analytical techniques used in practicing food and water laboratories.				
Pre-requisites (and Co-requisites and Impermissible combination)	chemistry I	l or CHEM2541 Physical chemistry I	CHEM2341 Inorganic chemistry I of or CHEM2041 Principles of chemistremical instrumentation, or already en	y; and	
Offer in 2014 - 2015	Y 2nd	sem	Examination	n May	
Offer in 2015 - 2016	Υ				
Course Grade	A+ to F				
Grade Descriptors	A Demonstrate through a thorough grasp of the knowledge and skills required in theory and laboratory work in food and water analysis to acquire accurate results with full interpretation for analytical application as described in all the course learning outcomes. Show strong analytical and critical abilities, logical thinking and capability to apply knowledge learnt to solve a wide range of complex issues and problems related to the analysis of food and water. Apply highly 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 attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities, logical thinking, and capability to apply knowledge learnt to solve a wide range of complex issues and problems related to the analysis of food and water. Apply effective organization and presentation skills as shown in class work.				
	C 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	outcomes. Lack of analytical and critical a	ommand of knowledge and skills required for a bilities, logical and coherent thinking. Show vethe analysis of food and water. Organization in class work.	ery little or no ability to apply	
Course Type	Lecture wit	th laboratory component course			
Course Teaching	Activities	;	Details	No. of Hours	
& Learning Activities	Lectures			24	
	Laborator	у		24	
	Tutorials			8	
	Reading / Self study			100	
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	
	Assignments			5	
	Examination			70	
	Laboratory reports		coursework assessment including laboratory work	15	
	Test			10	
Required/recommended reading and online materials		og, D. M. West, F. J. Holler, S.R. atest edition)	Crouch: Fundamentals of Analytica	l Chemistry (Cengage	
Additional Course Information		classes are mandatory. Students	hed material will be made throughout must complete ALL experiments an		

CHEM3243 Introductor	Academic Year	2014		
Offering Department	Chemistry Quota			
Course Co-ordinator	Dr X Li, Chemistry (xiangli@hku.hk)			
Teachers Involved	Dr X Li, Chemistry Dr K C J Wong, Chemistry			

Course Objectives	This course is designed for non-chemistry major students covering basic principles of separation and spectroscopy for chemical analysis. This course provides a general foundation for further studies in pharmacology, life and environmental sciences.					
Course Contents & Topics	Optical methods: Beer's Law; UV-visible, infrared, and atomic spectrometry; fluorescence; atomic mass spectrometry; grating spectrometer; photon detectors and thermal detectors.  Separation methods: partition; chromatography theories; high performance liquid chromatography (HPLC) and gas chromatography (GC); instrumental set up of HPLC and GC.  Mass spectrometry: fundamental concept of mass spectrometry; electrospray ionization (ESI) and matrix-assisted laser desorption ionization (MALDI); time-of-flight (TOF) and quadrupole (Q) mass analyzers.  NMR: basic principle of nuclear magnetic resonance.  Analysis and quality assurance: statistical analysis of small sets of data, control chart.					
Course Learning Outcomes	Explain 1     Describe	On successful completion of this course, students should be able to:  1. Explain the principles of the optical methods, separation methods, mass spectrometry, and NMR.  2. Describe the basic experimental set up and the properties of the basic components of the instruments used in the laboratory classes.				
Pre-requisites (and Co-requisites and Impermissible combination)	Not for stu	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.				
Offer in 2014 - 2015	Y 2nd	sem		Examination	May	
Offer in 2015 - 2016	Υ					
Course Grade	A+ to F					
Grade Descriptors	A	Demonstrate thorough grasp of the subject Show evidence of strong analytical abilities, logical and independent thinking, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations Demonstrate highly proficient lab skills and techniques and critical use of data and results to draw appropriate and insightful conclusions Demonstrate highly effective organization and presentation skills.				
	B - Demonstrate substantial grasp of the subject Show evidence of analytical abilities and logical thinking, some evidence of independent thinking, and ability to apply knowledge to familiar and some unfamiliar situations Demonstrate proficient lab skills and techniques and correct use of data and results to draw appropriate conclusions Demonstrate effective organization and presentation skills.					
	С	<ul> <li>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.</li> </ul>				
	<ul> <li>Demonstrate partial but limited grasp, with retention of some relevant information, of the subject.     of limited analytical abilities, little or no evidence of independent thinking, and limited ability to ap     solve problems Demonstrate partially effective lab skills and techniques and limited ability to use     to draw appropriate conclusions Demonstrate limited or barely effective organization and presents</li> </ul>				to apply knowledge to to use data and results	
	Fail	Fail  - Demonstrate little or no grasp of the knowledge and understanding of the subject Show little or no evidence analytical abilities, logical and independent thinking, and very little or no ability to apply knowledge to solv problems Demonstrate minimally effective or ineffective lab skills and techniques and misuse of data and result and/or unable to draw appropriate conclusions Demonstrate incoherent organization and poor presentation skills				
Course Type	Lecture wit	th laboratory component course				
Course Teaching & Learning Activities	Activities Details No. of Hou				No. of Hours	
& Learning Activities	Lectures				24	
	Laborator	у			28	
	Reading / Self study				100	
Assessment Methods and Weighting	Methods		Details		Weighting in final course grade (%)	
	Assignme	nts	(continuous asses	sment)	30	
	Assignme Examinati		(continuous asses	sment)	30 70	
Required/recommended reading and online materials	Examinati D.A. Skoog	on g, F.K. Holler, S.R. Crouch: Principle g, D.M. West, F.J. Holler, and S.R.	es of Instrumental Analy	ysis (Thomson, lat	70 rest edition).	

CHEM3244 Analytical tecl	nniques for pharmacy students (6 credits)	Academic Year	2014		
Offering Department	Chemistry	Quota	30		
Course Co-ordinator	Dr X Li, Chemistry (xiangli@hku.hk)	·			
Teachers Involved	Dr X Li, Chemistry Dr K C J Wong, Chemistry				
Course Objectives	This course is designed for Bachelor of Pharmacy students to provide an overview of different analytical and measurement techniques that are important to pharmacology and pharmaceutical sciences.				
Course Contents & Topics	Principles and Applications of different analytical and measurement t such as drug analysis and pharmacokinetics studies	echniques in pharm	aceutical sciences		
	Analysis and quality assurance: statistical analysis of data, control ch	art.			
	Analysis by Optical methods: Beer's Law; instrumentation, grating spectrometry: UV-visible, infrared, and atomic; emission spectrometry		ectors; absorption		

		eparation and Purification: partition raphy (HPLC) and gas chromatograph			
	Molecular Mass Measurements: mass spectrometry-fundamental concepts; various ionization techniques including electrospray ionization (ESI) and matrix-assisted laser desorption ionization (MALDI); time-of-flight (TOF) and quadrupole (Q) mass analyzers; use of mass spectrometry in drug analysis				
		agnetic resonance: basic principles; in of biological and pharmaceutical impo		lications in structur	e determination of
Course Learning Outcomes	On comple	tion of the course, the students should	be able to:		
	methods, n 2. Describe used in the 3. Apply	<ol> <li>Demonstrate knowledge and understanding of the principles of different optical methods, separation methods, mass spectrometry, NMR spectroscopy and their applications in pharmaceutical sciences.</li> <li>Describe the basic experimental set up and the properties of the basic components of the instruments used in the laboratory classes.</li> <li>Apply experimental skills in chemical analysis including sample preparation, standard solution preparation, instrument calibration, matrix effects correction (standard additions).</li> </ol>			
Pre-requisites (and Co-requisites and Impermissible combination)		n students only; and HM2136 Physical chemistry: principles	s and applications in	pharmaceutical sc	ience
Offer in 2014 - 2015	Y 2nd	2nd sem Examination May			May
Offer in 2015 - 2016	Υ				
Course Grade	A+ to F				
Grade Descriptors	Demonstrate thorough grasp of the subject Show evidence of strong analytical abilities, logical and independent thinking, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations Demonstrate highly proficient lab skills and techniques and critical use of data and results to draw appropriate and insightful conclusions Demonstrate highly effective organization and presentation skills.				
	В	- Demonstrate substantial grasp of the subject Show evidence of analytical abilities and logical thinking, some evidence of independent thinking, and ability to apply knowledge to familiar and some unfamiliar situations Demonstrate proficient lab skills and techniques and correct use of data and results to draw appropriate conclusions Demonstrate effective organization and presentation skills.			
	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	- 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 knowle analytical abilities, logical and independent problems Demonstrate minimally effective and/or unable to draw appropriate conclusions	thinking, and very little or ineffective lab skills ar	or no ability to apply d techniques and misus	knowledge to solve se of data and results
Course Type	Lecture wit	h laboratory component course			
Course Teaching	Activities		Details		No. of Hours
& Learning Activities	Lectures				24
	Laborator	/			28
	Reading / Self study				100
Assessment Methods and Weighting	Methods		Details		Weighting in final course grade (%)
	Assignme	nts	(continuous assess	sment)	30
	Examinati	on			70
Required/recommended reading and online materials		g, F.K. Holler, S.R. Crouch: Principles of D.M. West, F.J. Holler, and S.R. Con).			
Additional Course Information	Laboratory pass this co	classes are mandatory. Students mourse.	ust complete ALL ex	xperiments and lab	oratory reports to

CHEM3341 Inorganic che	mistry II (6 credits)	Academic Year	2014		
Offering Department	Chemistry Quota 82				
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 Chemistry I, with a more detailed treatment o general inorganic chemistry, with examples relevance to biological processes and material science, suited to the needs of those intending to extend their studies in chemistry.				
Course Contents & Topics	Chemistry of selected classes of inorganic, coordination and of mechanisms of their reaction where appropriate.	organometallic comp	ounds including		
	Structure, bonding, magnetism and spectral properties of inorgabioinorganic systems.	anic systems includi	ng examples in		

Course Learning Outcomes	On successful completion of this course, students should be able to:  1. Demonstrate knowledge of chemistry of selected classes of inorganic, coordination and organometallic compounds.  2. Understand structure, bonding, magnetism and spectral properties of inorganic systems.  3. Understand mechanisms of selected chemical reactions that are essential to coordination and organometallic compounds.  4. Gain appropriate knowledge of coordination compounds in biological systems.				
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in C	Pass in CHEM2341 Inorganic chemistry I			
Offer in 2014 - 2015	Y 1s	Y 1st sem Examination Dec			
Offer in 2015 - 2016	Υ			'	
Course Grade	A+ to F				
Grade Descriptors	A	the more advanced foundation knowled of inorganic, coordination and organon properties of inorganic systems includ integrate knowledge and theory relating strong ability to analyze novel problems insightful conclusions relating to the ess chemistry. Demonstrate highly effective	inderstanding of essential facts, concepts, pringe of inorganic chemistry, especially those re- netallic compounds; mechanisms of reactions in gexamples in bioinorganic systems. Show to the more advanced foundation knowledge and critical use of data and experimental re- nential and more advanced foundation principle laboratory skills and techniques, especially complexes, and their characterization by variations.	elated to structure and bonding s; and magnetic and spectral w strong ability to apply and a of inorganic chemistry. Show abults to draw appropriate and es and knowledge of inorganic in the synthesis and reactivity	
	В				
	Demonstrate general but incomplete command of knowledge and understanding of essential facts, concepts, principles, and theories relating to the more advanced foundation knowledge of inorganic chemistry, especially those related to structure and bonding of inorganic, coordination and organometallic compounds; mechanisms of reactions; and magnetic and spectral properties of inorganic systems including examples in bioinorganic systems. Show evidence of some abilities to apply and integrate knowledge and theory relating to the more advanced foundation knowledge of inorganic chemistry. Show ability to analyze problems to most familiar situations and mostly correct but erroneous use of data and experimental results to draw appropriate conclusions relating to the essential and more advanced foundation principles and knowledge of inorganic chemistry. Demonstrate moderately effective laboratory skills and techniques, especially in the synthesis and reactivity study of inorganic compounds and metal complexes, and their characterization by various spectroscopic methods.				
	D	Demonstrate partial but limited commar and theories relating to the more advan- structure and bonding of inorganic, co magnetic and spectral properties of ino of limited abilities to apply and integrate of inorganic chemistry. Show limited at erroneous use of data and experimenta advanced foundation principles and kn	nd of knowledge and understanding of essent ced foundation knowledge of inorganic chemis ordination and organometallic compounds; nr ganic systems including examples in bioinorg knowledge and theory relating to the more ac- pility to analyze problems to most familiar situ I results to draw appropriate conclusions rela- owledge of inorganic chemistry. Demonstrat- synthesis and reactivity study of inorganic com	stry, especially those related to nechanisms of reactions; and ganic systems. Show evidence dvanced foundation knowledge lations and mostly correct but ting to the essential and more e partially effective laboratory	
	Fail	principles, and theories relating to the m related to structure and bonding of inorg and magnetic and spectral properties of no evidence of abilities to apply and i knowledge of inorganic chemistry. She erroneous use of data and experimenta advanced foundation principles and kn	command of knowledge and understanding ore advanced foundation knowledge of inorga anic, coordination and organometallic compou inorganic systems including examples in bioin ntegrate knowledge and theory relating to the little or no ability to analyze problems to it results to draw appropriate conclusions related to the contract of	unic chemistry, especially those inds; mechanisms of reactions; lorganic systems. Show little or the more advanced foundation or most familiar situations and ting to the essential and more minimally effective laboratory	
Course Type	Lecture v	vith laboratory component course			
Course Teaching	Activitie	es	Details	No. of Hours	
& Learning Activities	Lectures			24	
	Laborato			24	
	Tutorials	3		6	
	Reading	/ Self study		100	
Assessment Methods and Weighting	Method	S	Details	Weighting in final course grade (%)	
	Assignm	ents	including lab report & test	30	
	Examina	ation		70	
Required/recommended reading and online materials		Atkins, Inorganic Chemistry (4th Ede, Housecroft & Sharpe, Inorganic C	d.), Oxford University Press, 2005 hemistry (3nd Ed.), Prentice Hall, 200	08	
Additional Course Information	Laborato pass this		s must complete ALL experiments a	and laboratory reports to	

CHEM3342 Bioinorganic ch	norganic chemistry (6 credits)		2014
Offering Department	Chemistry	Quota	50

Course Co-ordinator	Prof H Z	Sun, Chemistry (hsun@hku.hk)				
Teachers Involved		u Yeung, Chemistry Sun, Chemistry				
Course Objectives	and mor	This course is a continuation from Basic Inorganic Chemistry and Basic Organic Chemistry, giving further and more details of inorganic chemistry in biological system, with examples relevance to biological processes and medical science, suited to the needs of those intending to extend their studies in (bio) chemistry and biomedical science.				
Course Contents & Topics	biochem metals in	Bioinorganic Chemistry of selected topics of interest. Examples include the inorganic chemistry (and biochemistry) behind the requirement of biological cells for metals such as zinc, iron and copper; and metals in medicine such as mechanisms by which organisms obtain required metal ions from their environment, and use of metal-containing compounds in treating diseases such as cancer.				
Course Learning Outcomes	On succe	essful completion of this course,	students should be able to:			
	<ol> <li>Under</li> <li>Under</li> </ol>	<ol> <li>Understand the principles and concepts of inorganic/organic chemistry in biological system.</li> <li>Understand structure, bonding, and spectral properties of selected metals in proteins and nucleic acids.</li> <li>Understand chemical mechanisms of selected metal homeostasis (i.e. uptake, transport and storage).</li> <li>Understand the role of metal complexes medicine.</li> </ol>				
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in (	CHEM2341 Inorganic chemistry I				
Offer in 2014 - 2015	Y 2r	nd sem	Examination	on May		
Offer in 2015 - 2016	Υ					
Course Grade	A+ to F					
Grade Descriptors	A	the basic foundation knowledge of chelation; structure and bonding of biological processes and their relev integrate knowledge and theory rela ability to analyze novel problems ar conclusions relating to the basic pr	ind understanding of essential facts, concepts, principles in bioinorganic chemistry, especially those related the metals in biological systems; thermodynamic and kance to metal homeostasis; metal-based drugs. Shating to the basic foundation knowledge of bioinorg districted use of data and experimental results to dinciples and knowledge of bioinorganic chemistry. Characterization of inorganic active site and overall metals.	o hard-soft acid-base theory; inetic aspects of metal ions in ow strong ability to apply and ganic chemistry. Show strong raw appropriate and insightful Demonstrate highly effective		
	B Demonstrate substantial command of knowledge and understanding of essential facts, concepts, principles, and theories relating to the basic foundation knowledge of bioinorganic chemistry, especially those related to hard-soft acid-base theory; chelation; structure and bonding of metals in biological systems; thermodynamic and kinetic aspects of metal ions in biological processes and their relevance to metal homeostasis; metal-based drugs. Show evidence to apply and integrate knowledge and theory relating to the basic foundation knowledge of bioinorganic chemistry. Show evidence to analyze novel problems and correct use of data and experimental results to draw appropriate conclusions relating to the basic principles and knowledge of bioinorganic chemistry. Demonstrate effective basic techniques, especially in the characterization of inorganic active site and overall metallo-biomolecules.					
	Demonstrate general but incomplete command of knowledge and understanding of essential facts, concepts, principles, and theories relating to the basic foundation knowledge of bioinorganic chemistry, especially those related to hard-soft acid-base theory; chelation; structure and bonding of metals in biological systems; thermodynamic and kinetic aspects of metal ions in biological processes and their relevance to metal homeostasis; metal-based drugs. Show evidence of some abilities to apply and integrate knowledge and theory relating to the basic foundation knowledge of bioinorganic chemistry. Show ability to analyze problems to most familiar situations and mostly correct but erroneous use of data and experimental results to draw appropriate conclusions relating to the basic principles and knowledge of bioinorganic chemistry. Demonstrate moderately effective basic techniques, especially in the characterization of inorganic active site and overall metallo-biomolecules.					
	D	and theories relating to the basic fr soft acid-base theory; chelation; str aspects of metal ions in biological evidence of limited abilities to apply of bioinorganic chemistry. Show lim erroneous use of data and experim knowledge of bioinorganic chem	nmand of knowledge and understanding of essenti bundation knowledge of bioinorganic chemistry, es ructure and bonding of metals in biological system processes and their relevance to metal homeostas and integrate knowledge and theory relating to the ited ability to analyze problems to most familiar situental results to draw appropriate conclusions relati- istry. Demonstrate partially effective basic tec- site and overall metallo-biomolecules.	pecially those related to hard s; thermodynamic and kinetic is; metal-based drugs. Show e basic foundation knowledge lations and mostly correct but ng to the basic principles and		
	Fail	principles, and theories relating to the to hard-soft acid-base theory; chela kinetic aspects of metal ions in biol Show little or no evidence of abilitic knowledge of bioinorganic chemists erroneous use of data and experim knowledge of bioinorganic chemist.	of command of knowledge and understanding ne basic foundation knowledge of bioinorganic chen tition; structure and bonding of metals in biological processes and their relevance to metal homes to apply and integrate knowledge and theory rery. Show little or no ability to analyze problems to ental results to draw appropriate conclusions relatifiestry. Demonstrate minimally effective basic tensite and overall metallo-biomolecules.	nistry, especially those related systems; thermodynamic and leostasis; metal-based drugs. lating to the basic foundation most familiar situations and ng to the basic principles and		
Course Type	Lecture-l	based course				
Course Teaching	Activitie	es	Details	No. of Hours		
& Learning Activities	Lectures		- Stallo	36		
			including literature survey &			
	Tutorials	S	presentation	12		
	Reading	g / Self study		100		
	Method	s	Details	Weighting in final course grade (%)		
Assessment Methods and Weighting						
	Assignn	nents	(continuous assessment of	25		
	Assignn		(continuous assessment of assignments and presentation)	25		

	Reactivity, University Science Books, 2007
Additional Course Information	Metals and Life, Moore C., RSC Publishing, 2010. Bioinorganic Chemistry: Inorganic Elements in the Chemistry of Life, Kaim W. & Schwederski B., John Wiley & Sons, 2013.

	try II (6 cr	edits)		Academic Year	2014		
Offering Department	Chemistry			Quota	90		
Course Co-ordinator	Prof D Yar	g, Chemistry (yangdan@hku.hk)					
Teachers Involved	Prof D Yar	g, Chemistry					
Course Objectives	focuses pr	a continuation from CHEM1003, this course aims to provide a solid foundation of organic chemistry. It cuses primarily on the basic principles to understand the structure and reactivity of organic molecules, the examples illustrating the role of organic chemistry in biology, medicine, and industry.					
Course Contents & Topics		emistry of common organic functional groups: ketones and aldehydes; carboxylic acids and their rivatives; amines and heterocycles; aromatic chemistry. Principles of organic synthesis.					
Course Learning Outcomes	On succes	successful completion of this course, students should be able to:					
	2. Draw co 3. Underst 4. Write r carboxylic 5. Apprecia 6. Devise s	and employ the vocabulary of organice of the tructural representations of organd the basic principles of structure easonable mechanisms for transfacids, acyl halides, anhydrides, estate the importance of organic chemics of the pathways to organic computation of the laboratory synthesis, purification	rganic molecules. and reactivity of organ formations of carbony ers, amides), nitriles, ar istry in daily life. ounds using functional	d compounds (alded amines.  group chemistry.	•		
Pre-requisites and Co-requisites and mpermissible combination)		IEM2441 Organic chemistry I; and HEM3146 Principles of application	ns of spectroscopic tec	chniques, or alread	dy enrolled in this		
Offer in 2014 - 2015	Y 2nd	Y 2nd sem		Examination	May		
Offer in 2015 - 2016	Υ	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 lab skills and techniques.      Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of						
	С	the course learning outcomes. Show evic apply knowledge to familiar and some unfa Demonstrate general but incomplete com learning outcomes. Show evidence of sor	dence of analytical and critic amiliar situations. Apply effect nmand of knowledge and sk me analytical and critical ab	cal abilities and logical to ctive lab skills and technical techni	thinking, and ability to iques.  In most of the course		
	C	the course learning outcomes. Show evic apply knowledge to familiar and some unfa Demonstrate general but incomplete com	dence of analytical and critic amiliar situations. Apply effect nmand of knowledge and sk me analytical and critical ab oly moderately effective lab sl of knowledge and skills requerent and logical thinking, b	cal abilities and logical to citive lab skills and technicities required for attainin dilties and logical thinkin kills and techniques. Luired for attaining some tut with limited analytica	thinking, and ability to iques.  Ig most of the course g, and ability to apply of the course learning and critical abilities.		
		the course learning outcomes. Show evic apply knowledge to familiar and some unfa Demonstrate general but incomplete com learning outcomes. Show evidence of sor knowledge to most familiar situations. App Demonstrate partial but limited command outcomes. Show evidence of some cohe	dence of analytical and critical amiliar situations. Apply effect a miliar situations. Apply effect and situation	cal abilities and logical to titive lab skills and technical kills required for attainin tillities and logical thinkin kills and techniques. Lired for attaining some ut with limited analytica tilly effective lab skills and tills required for attainin thinking. Show very little	thinking, and ability to iques.  Ig most of the course ig, and ability to apply of the course learning il and critical abilities, d techniques.  Ig the course learning e or no ability to apply		
ourse Type	D Fail	the course learning outcomes. Show evic apply knowledge to familiar and some unfa Demonstrate general but incomplete com learning outcomes. Show evidence of sor knowledge to most familiar situations. App Demonstrate partial but limited command outcomes. Show evidence of some cohe Show limited ability to apply knowledge to Demonstrate little or no evidence of com outcomes. Lack of analytical and critical a	dence of analytical and critical amiliar situations. Apply effect a miliar situations. Apply effect and situation	cal abilities and logical to titive lab skills and technical kills required for attainin tillities and logical thinkin kills and techniques. Lired for attaining some ut with limited analytica tilly effective lab skills and tills required for attainin thinking. Show very little	thinking, and ability to iques.  Ig most of the course ig, and ability to apply of the course learning il and critical abilities. d techniques.  Ig the course learning e or no ability to apply		
Course Teaching	D Fail	the course learning outcomes. Show evic apply knowledge to familiar and some unfa Demonstrate general but incomplete com learning outcomes. Show evidence of sor knowledge to most familiar situations. App Demonstrate partial but limited command outcomes. Show evidence of some cohe Show limited ability to apply knowledge to Demonstrate little or no evidence of com outcomes. Lack of analytical and critical a knowledge to solve problems. Apply minim the laboratory component course	dence of analytical and critical amiliar situations. Apply effect a miliar situations. Apply effect and situation	cal abilities and logical to titive lab skills and technical kills required for attainin tillities and logical thinkin kills and techniques. Lired for attaining some ut with limited analytica tilly effective lab skills and tills required for attainin thinking. Show very little	thinking, and ability to iques.  Ig most of the course ig, and ability to apply of the course learning il and critical abilities, d techniques.  Ig the course learning e or no ability to apply		
Course Teaching	D Fail	the course learning outcomes. Show evic apply knowledge to familiar and some unfa Demonstrate general but incomplete com learning outcomes. Show evidence of sor knowledge to most familiar situations. App Demonstrate partial but limited command outcomes. Show evidence of some cohe Show limited ability to apply knowledge to Demonstrate little or no evidence of com outcomes. Lack of analytical and critical a knowledge to solve problems. Apply minim the laboratory component course	dence of analytical and critic amiliar situations. Apply effections and of knowledge and skills me analytical and critical aboly moderately effective lab sloof knowledge and skills requerent and logical thinking, be solve problems. Apply partial mand of knowledge and skabilities, logical and coherent nally effective or ineffective land.	cal abilities and logical to titive lab skills and technical kills required for attainin tillities and logical thinkin kills and techniques. Lired for attaining some ut with limited analytica tilly effective lab skills and tills required for attainin thinking. Show very little	thinking, and ability to iques.  Ig most of the course ig, and ability to apply  of the course learning  I and critical abilities.  I techniques.  I the course learning  I and critical abilities.  I the course learning  I the cou		
Course Teaching	D Fail Lecture with Activities	the course learning outcomes. Show evic apply knowledge to familiar and some unfa Demonstrate general but incomplete com learning outcomes. Show evidence of sor knowledge to most familiar situations. App Demonstrate partial but limited command outcomes. Show evidence of some cohe Show limited ability to apply knowledge to Demonstrate little or no evidence of com outcomes. Lack of analytical and critical a knowledge to solve problems. Apply minim	dence of analytical and critic amiliar situations. Apply effections and of knowledge and skills me analytical and critical aboly moderately effective lab sloof knowledge and skills requerent and logical thinking, be solve problems. Apply partial mand of knowledge and skabilities, logical and coherent nally effective or ineffective land.	cal abilities and logical to titive lab skills and technical kills required for attainin tillities and logical thinkin kills and techniques. Lired for attaining some ut with limited analytica tilly effective lab skills and tills required for attainin thinking. Show very little	thinking, and ability to iques.  Ig most of the course ig, and ability to apply of the course learning il and critical abilities, d techniques.  Ig the course learning e or no ability to apply		
Course Teaching	D Fail Lecture with	the course learning outcomes. Show evic apply knowledge to familiar and some unfa Demonstrate general but incomplete com learning outcomes. Show evidence of sor knowledge to most familiar situations. App Demonstrate partial but limited command outcomes. Show evidence of some cohe Show limited ability to apply knowledge to Demonstrate little or no evidence of com outcomes. Lack of analytical and critical a knowledge to solve problems. Apply minim	dence of analytical and critic amiliar situations. Apply effections and of knowledge and skills me analytical and critical aboly moderately effective lab sloof knowledge and skills requerent and logical thinking, be solve problems. Apply partial mand of knowledge and skabilities, logical and coherent nally effective or ineffective land.	cal abilities and logical to titive lab skills and technical kills required for attainin tillities and logical thinkin kills and techniques. Lired for attaining some ut with limited analytica tilly effective lab skills and tills required for attainin thinking. Show very little	thinking, and ability to iques.  Ig most of the course ig, and ability to apply of the course learning il and critical abilities d techniques.  If the course learning e or no ability to apply  No. of Hour		
Course Teaching	D Fail Lecture with Activities Lectures Laborator Tutorials	the course learning outcomes. Show evic apply knowledge to familiar and some unfa Demonstrate general but incomplete com learning outcomes. Show evidence of sor knowledge to most familiar situations. App Demonstrate partial but limited command outcomes. Show evidence of some cohe Show limited ability to apply knowledge to Demonstrate little or no evidence of com outcomes. Lack of analytical and critical a knowledge to solve problems. Apply minim	dence of analytical and critic amiliar situations. Apply effections and of knowledge and skills me analytical and critical aboly moderately effective lab sloof knowledge and skills requerent and logical thinking, be solve problems. Apply partial mand of knowledge and skabilities, logical and coherent nally effective or ineffective land.	cal abilities and logical to titive lab skills and technical kills required for attainin tillities and logical thinkin kills and techniques. Lired for attaining some ut with limited analytica tilly effective lab skills and tills required for attainin thinking. Show very little	thinking, and ability to iques.  Ig most of the course ig, and ability to apply of the course learning if and critical abilities dischniques.  If the course learning is or no ability to apply in the course learning in the course learning is or no ability to apply in the course is or no		
Course Teaching & Learning Activities  Assessment Methods	D Fail Lecture with Activities Lectures Laborator Tutorials	the course learning outcomes. Show evic apply knowledge to familiar and some unfa Demonstrate general but incomplete com learning outcomes. Show evidence of som knowledge to most familiar situations. App Demonstrate partial but limited command outcomes. Show evidence of some cohe Show limited ability to apply knowledge to Demonstrate little or no evidence of com outcomes. Lack of analytical and critical a knowledge to solve problems. Apply minim th laboratory component course	dence of analytical and critic amiliar situations. Apply effections and of knowledge and skills me analytical and critical aboly moderately effective lab sloof knowledge and skills requerent and logical thinking, be solve problems. Apply partial mand of knowledge and skabilities, logical and coherent nally effective or ineffective land.	cal abilities and logical to trive lab skills and technicities and logical thinkin kills and technicities and logical thinkin kills and techniques. Some attaining some ut with limited analytica ally effective lab skills and techniques. Show very little ab skills and techniques.	thinking, and ability to iques.  Ig most of the course g, and ability to apply of the course learning and critical abilities d techniques.  Ig the course learning e or no ability to apply No. of Hour 2		
Course Teaching & Learning Activities  Assessment Methods	D Fail Lecture with Activities Lectures Laborator Tutorials Reading /	the course learning outcomes. Show evic apply knowledge to familiar and some unfa Demonstrate general but incomplete com learning outcomes. Show evidence of som knowledge to most familiar situations. App Demonstrate partial but limited command outcomes. Show evidence of some cohe Show limited ability to apply knowledge to Demonstrate little or no evidence of com outcomes. Lack of analytical and critical a knowledge to solve problems. Apply minim the laboratory component course	dence of analytical and critical amiliar situations. Apply effect manual of knowledge and shappy moderately effective lab slop of knowledge and skills requerent and logical thinking, because of knowledge and skills requerent and logical thinking, because of knowledge and skills requerent and foliar thinking, because of knowledge and skills and the knowledge and skillsties, logical and coherent mally effective or ineffective label.	cal abilities and logical to tive lab skills and technicities and logical thinkin tills and technicities and logical thinkin kills and techniques. Lired for attaining some ut with limited analytically effective lab skills and techniques thinking. Show very little ab skills and techniques.	thinking, and ability to iques.  Ig most of the course g, and ability to apply of the course learning and critical abilities d techniques.  Ig the course learning e or no ability to apply No. of Hour 2  Weighting in fina		
Course Type Course Teaching & Learning Activities  Assessment Methods and Weighting	D Fail Lecture with Activities Lectures Laborator Tutorials Reading / Methods	the course learning outcomes. Show evic apply knowledge to familiar and some unfa Demonstrate general but incomplete com learning outcomes. Show evidence of sor knowledge to most familiar situations. App Demonstrate partial but limited command outcomes. Show evidence of some cohe Show limited ability to apply knowledge to Demonstrate little or no evidence of com outcomes. Lack of analytical and critical a knowledge to solve problems. Apply minimal haboratory component course	dence of analytical and critical amiliar situations. Apply effect mmand of knowledge and shapped and state of knowledge and state of knowledge and skills requerent and logical thinking, become an analytical and critical about of knowledge and skills requerent and logical thinking, become and of knowledge and skabilities, logical and coherent anally effective or ineffective is a partial because of the company	cal abilities and logical to tive lab skills and technicities and logical thinkin tills and technicities and logical thinkin kills and techniques. Lired for attaining some ut with limited analytically effective lab skills and techniques thinking. Show very little ab skills and techniques.	thinking, and ability to iques.  Ig most of the course g, and ability to apply of the course learning and critical abilities d techniques.  If the course learning of the course learning or no ability to apply to apply the course learning or no ability to apply to apply the course or no ability to apply the course or no ability to apply the course of		
Course Teaching & Learning Activities  Assessment Methods	D Fail Lecture wir Activities Lectures Laborator Tutorials Reading / Methods Assignme Examinati Paula Y. B J.McMurry	the course learning outcomes. Show evic apply knowledge to familiar and some unfa Demonstrate general but incomplete com learning outcomes. Show evidence of sor knowledge to most familiar situations. App Demonstrate partial but limited command outcomes. Show evidence of some cohe Show limited ability to apply knowledge to Demonstrate little or no evidence of com outcomes. Lack of analytical and critical a knowledge to solve problems. Apply minimal haboratory component course	dence of analytical and critical amiliar situations. Apply effect amiliar situations. Apply effect amiliar situations and situations and situation and critical aboly moderately effective lab slow of knowledge and skills requerent and logical thinking, be solve problems. Apply partial aminand of knowledge and skabilities, logical and coherent anally effective or ineffective label.    Details	cal abilities and logical to tive lab skills and technicities and logical thinkin kills and technicities and logical thinkin kills and techniques.  Lived for attaining some ut with limited analytica ally effective lab skills and lilly effective lab skills and techniques.  Lived for attaining some ut with limited analytica lilly effective lab skills and techniques.	thinking, and ability to iques.  Ig most of the course g, and ability to apply of the course learning and critical abilities d techniques.  If the course learning e or no ability to apply to apply to apply to apply the course learning e or no ability to apply to apply the course grade (%)  Weighting in fina course grade (%)		

CHEM3442 Organic chemistry of biomolecules (6 credits)		A	cademic Year	2014		
Offering Department	Chemistry	luota	50			
Course Co-ordinator	Dr P H Toy, Chemistry (phtoy@hku.hk)	Dr P H Toy, Chemistry (phtoy@hku.hk)				
Teachers Involved	Dr P H Toy, Chemistry	Dr P H Toy, Chemistry				

Course Objectives		The major objective of this course is to give the students an understanding and appreciation of the role of organic chemistry in biology and biochemistry.				
Course Contents & Topics		The chemistry of organic molecule groups such as carbohydrates, amino acids, peptides, coenzymes, nucleotides and lipids will discussed. Enzyme catalysis, cofactors and inhibitors will also be presented.				
Course Learning Outcomes	1. Have a	On successful completion of this course, students should be able to:  1. Have a basic understanding of biologically important organic molecules.  2. Have a basic understanding of enzyme catalysis.				
		iate how organic chemistry plays an ir	,	oiochemistry.		
Pre-requisites (and Co-requisites and Impermissible combination)		Pass in CHEM2442 Fundamentals of organic chemistry or CHEM2443 Fundamentals of organic chemistry for pharmacy students or CHEM3441 Organic chemistry II				
Offer in 2014 - 2015	Y 1st	sem	Exan	nination	Dec	
Offer in 2015 - 2016	Υ		'		'	
Course Grade	A+ to F					
Grade Descriptors	A	Demonstrate thorough mastery at an adva skills required for attaining all the course le thinking, with evidence of original thought, unfamiliar problems. Apply highly effective of	arning outcomes. Show strong ana and ability to apply knowledge to a	llytical and critic wide range of	al abilities and logical	
	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	Demonstrate general but incomplete command of biomolecule organic chemistry knowledge, and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar problems. Apply moderately effective organizational and presentational skills.				
	D	D 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	Demonstrate little or no evidence of comm attaining the course learning outcomes. La very little or no ability to apply knowledge effective or ineffective.	ck of analytical and critical abilities,	, logical and co	herent thinking. Show	
Course Type	Lecture-b	ased course				
Course Teaching	Activitie	s	Details		No. of Hours	
& Learning Activities	Lectures				36	
	Tutorials				12	
	Reading	/ Self study			100	
Assessment Methods and Weighting	Methods	3	Details		Weighting in final course grade (%)	
	Examina	tion			60	
	Presenta	ation			10	
	Test		2-mid term tests		30	
Required/recommended reading and online materials	Paula Y. I	Bruice, "Organic Chemistry", 2011, 6th	n Edition, Pearson, Chapters	21-27.		

CHEM3541 Physical chem credits)	istry II: introduction to quantum chemistry (6	Academic Year	2014
Offering Department	Chemistry	Quota	80
Course Co-ordinator	Prof A S C Cheung, Chemistry (hrsccsc@hku.hk)		
Teachers Involved	Prof A S C Cheung, Chemistry		
Course Objectives	The course presents fundamental principles and topics on quant foundation for students intending to further their studies in chemis		o provide a soiled
Course Contents & Topics	Elementary quantum mechanics: Historical development, Postula quantum mechanics, Theory of angular momentum, Heisenbe simple systems: particle in a box, harmonic oscillator, rigid rotate electron atoms. Molecular structure and chemical bonds. Appr Hartree-Fock method, valence bond theory, and perturbation theory.	rg uncertainty principle or; Atomic structure: Hydoximation methods: va	. Applications to drogen and many
Course Learning Outcomes	On successful completion of this course, students should be able  1. Understand and use the terminology and nomenclature in quathe course.  2. Demonstrate knowledge and understanding of basic concept molecular structure.  3. Understand elementary numerical procedures and the basic molecular systems.  4. Hands-on experience of the application of Hartree-Fock method	antum chemistry and to ots in quantum mechal relationships of quantur	nics, atomic and

Pre-requisites (and Co-requisites and Impermissible combination)	Pass in Cl	Pass in CHEM2541 Physical chemistry I  Y 1st sem Examination Dec					
Offer in 2014 - 2015	Y 1st	sem		Examination	Dec		
Offer in 2015 - 2016	Υ						
Course Grade	A+ to F						
Grade Descriptors	A	Demonstrate thorough mastery at an advan course learning outcomes. Show strong and subject, and ability to apply knowledge to a effective lab skills and techniques. Critical us	llytical and critical abilities ar a wide range of complex, far	nd logical thinking, with miliar and unfamiliar s	thorough grasp of the tuations. 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 substantial grasp of the subject, ability to apply knowledge to familiar and some unfamiliar situations. Apply effective lab skills and techniques. Correct use of data of results to draw appropriate conclusions.						
	C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and general but incomplete grasp of the subject, ability to apply knowledge to most familiar situations. Apply moderately effective lab skills and techniques. Mostly correct but some erroneous use of data and results to draw appropriate conclusions.						
	D						
	Fail	Demonstrate little or no evidence of commoutcomes. Lack of analytical and critical a knowledge and understanding of the subjer minimally effective or ineffective lab skills appropriate conclusions.	abilities, logical and cohere ct, very little or no ability to	nt thinking. Show little apply knowledge to s	e or no grasp of the solve problems. Apply		
Course Type	Lecture wi	th laboratory component course					
Course Teaching	Activities Deta		Details		No. of Hours		
& Learning Activities	Lectures				24		
	Laborato	у			24		
	Tutorials				6		
	Reading / Self study				100		
Assessment Methods and Weighting	Methods		Details		Weighting in final course grade (%)		
	Examinat	ion			70		
	Laborato	ry reports	Experiment & Lab r	eport	20		
	Test		Test/Quiz		10		
Required/recommended reading and online materials		uarrie: Quantum Chemistry (2nd Editi n: Quantum Chemistry (5th Edition, 20		1			
Additional Course Information	Laboratory pass this o	course.	nust complete ALL ex	periments and lab	oratory reports to		

CHEM3999 Directed studie	es in chemistry (6 credits)	Academ	ic Year	2014
Offering Department	Chemistry	Quota		
Course Co-ordinator	Prof D L Phillips, Chemistry (phillips@hku.hk)	'		'
Teachers Involved	various teachers in the Department, Chemistry			
Course Objectives	This course is designed for second year studies research. It offers students an opportunity to carr			
Course Contents & Topics	Students interested in taking this course should the contents and the nature of their project in the prospective supervisor and the course coordinate.	he coming academic year. P		
Course Learning Outcomes	On successful completion of this course, students  1. Understand the terminology and nomenclatur worked on in the course.  2. Demonstrate knowledge and understanding of 3. Understand the relationships of the their partic	re associated with the small basic concepts involved in the	eir chemi	cal project.
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in at least 24 credits of advanced leve CHEM4XXX) in the Chemistry Major including a Organic chemistry I or CHEM2541 Physical chem or CHEM3146 Principles and applications of spec This capstone course is for Chemistry Major stud	pass in CHÉM2341 Inorgani nistry I or CHEM2442 Fundar ctroscopic techniques.	c chemist	ry I or CHEM2441
Offer in 2014 - 2015	Y 2nd sem	Examina	ation	No Exam
Offer in 2015 - 2016	Υ	'		
Course Grade	A+ to F			
Grade Descriptors				

	A	Show an extensive comprehension of the presence of some originality. Illuminating utili wide range of high quality sources. Critical em conclusions. Demonstrate integration of a wid very effective organizational and presentation beyond that is required in wider areas relevan	zation and critical analysis / evaluation of info ployment of data and results to synthesize ap le range of appropriate theories, principles, da hal skills. [Work of A+ should demonstrate su	propriate and illuminating ata and methods. Employ		
	В	Show a substantial comprehension of the s relevant information from sources. Demons secondary interpretations. Correct utilization of integration of theories, principles, data and me	trate ability to compose meaningful compar of data and results to form appropriate conclu	risons between different usions. Compose general		
	С	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 coherent thinking. Limited employment of set data and results and/or unable to form apprinciples, data and methods. Organization and methods.	condary sources and no critical comparison of ropriate conclusions. Demonstrate little or no	of them. Incorrectly utilize integration of theories,		
Course Type	Project-ba	ased course				
Course Teaching & Learning Activities	Activities	s	Details	No. of Hours		
a Learning Activities	Reading	/ Self study	discussion & meetings to be arranged by the student and the supervisor	96		
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)		
	Dissertati	ion	including a written report and an oral presentation	100		
Required/recommended reading	Recomme	ended reading material will be assigned	depending on the project.			
and online materials						

On Lemmara Oyunnou y, gro	up theory and	I applications (6 credits)  Academic Yea	r 2014			
Offering Department	Chemistry	Quota	60			
Course Co-ordinator	Prof V W W Y	am, Chemistry (wwyam@hku.hk)				
Teachers Involved	Prof V W W Y Prof C M Che	am, Chemistry , Chemistry				
Course Objectives	problems. Th and vibrational	the concepts of symmetry and group theory and to apply them is course also provides an introductory treatment of bonding theories, all spectroscopy. This course is essential for students who wish to take mistry and all types of spectroscopy.	inorganic electron			
Course Contents & Topics	representation operators; hy	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.				
	solving chemi	d the basic principles and concepts of symmetry and group theory a cal problems.  te knowledge and understanding in the use of character tables and				
	orbitals for org 4. Demonstra	te knowledge and understanding of bonding theories involving hybrid or ganic, inorganic and organometallic systems. In the application of symmetry a pribrational spectroscopy.	bitals and molecula			
(and Co-requisites and	Demonstration orbitals for organization	te knowledge and understanding of bonding theories involving hybrid or ganic, inorganic and organometallic systems. Ite knowledge and understanding in the application of symmetry a	bitals and molecula			
(and Co-requisites and Impermissible combination)	Demonstration orbitals for organization	te knowledge and understanding of bonding theories involving hybrid or ganic, inorganic and organometallic systems. It knowledge and understanding in the application of symmetry a lyibrational spectroscopy.	bitals and molecula			
(and Co-requisites and Impermissible combination) Offer in 2014 - 2015	Demonstra orbitals for org     Demonstra electronic and  Pass in CHEM	te knowledge and understanding of bonding theories involving hybrid or ganic, inorganic and organometallic systems. It knowledge and understanding in the application of symmetry a l vibrational spectroscopy.	bitals and moleculand group theory in			
Pre-requisites (and Co-requisites and Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade	3. Demonstra orbitals for org 4. Demonstra electronic and Pass in CHEN  Y 1st sem	te knowledge and understanding of bonding theories involving hybrid or ganic, inorganic and organometallic systems. It knowledge and understanding in the application of symmetry a l vibrational spectroscopy.	bitals and moleculand group theory in			

		group theory.			
	В	Demonstrate substantial command of knowle theories relating to symmetry and group theorelated to symmetry elements and symme representations; character tables; direct pro- treatment of bonding theories including hybric systems; and applications in electronic and knowledge and theory relating to the basic applications in bonding, and electronic and vi- correct use of data and experimental resu- applications of symmetry and group theory.	ry and their applications in solving chemic y operations; symmetry point groups bucts; symmetry-adapted linear combin d orbitals and molecular orbitals for organ d vibrational spectroscopy. Show evide e principles and concepts of symmetry brational spectroscopy. Show evidence to	al problems, especially those; reducible and irreducible ations; projection operators; ic, inorganic and orgametallic nee to apply and integrate and group theory and their analyze novel problems and	
	С	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 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 some abilities to apply and integrate knowledge and theory relating to the basic principles and concepts of symmetry and group theory and their applications in bonding, and electronic and vibrational spectroscopy. Show ability to analyze problems to most familiar situations and mostly correct but erroneous use of data and experimental results to draw appropriate conclusions relating to the principles and applications of symmetry and group theory.			
	D	Demonstrate partial but limited command of and theories relating to symmetry and group those related to symmetry elements and syr representations; character tables; direct protreatment of bonding theories including hybric systems; and applications in electronic and vintegrate knowledge and theory relating to the applications in bonding, and electronic and most familiar situations and mostly correct but conclusions relating to the principles and applications.	theory and their applications in solving commetry operations; symmetry point grounducts; symmetry-adapted linear combinal orbitals and molecular orbitals for organibrational spectroscopy. Show evidence ob abasic principles and concepts of symmetribrational spectroscopy. Show limited all atterroneous use of data and experimental	hemical problems, especially ps; reducible and irreducible ations; projection operators; ic, inorganic and orgametallic f limited abilities to apply and ry and group theory and their bility to analyze problems to	
	Fail	Demonstrate little or no evidence of comm principles, and theories relating to symmetry especially those related to symmetry elemer irreducible representations; character tables operators; treatment of bonding theories inclorgametallic systems; and applications in el abilities to apply and integrate knowledge and group theory and their applications in bonding analyze problems to most familiar situations a conclusions relating to the principles and appl	and group theory and their applications into and symmetry operations; symmetry; direct products; symmetry-adapted linuding hybrid orbitals and molecular orbital ectronic and vibrational spectroscopy. So theory relating to the basic principles are, and electronic and vibrational spectroscot, and electronic and vibrational spectroscot, and erroneous use of data and experiment	n solving chemical problems, point groups; reducible and ear combinations; projection als for organic, inorganic and how little or no evidence of ad concepts of symmetry and ppy. Show little or no ability to	
Course Type	Lecture-bas	sed 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 (%)	
	Assignme	nts	(continuous assessment)	25	
	Examination	on		75	
Required/recommended reading and online materials	F.A. Cotton	: Chemical Applications of Group The	ory (Wiley, 3rd ed., 1990)		

CHEM4143 Interfacial scie	nce and technol	logy (6 credits)		Academic Year	2014
Offering Department	Chemistry			Quota	50
Course Co-ordinator	Prof G K Y Chan	n, Chemistry (hrsccky@hku.hk)			
Teachers Involved	Prof G K Y Chan Guest lecturer, C				
Course Objectives		he science and technology of ir oducts and modern technologies		and processes ofter	n appeared in hig
Course Contents & Topics		Chemistry of Interfaces: coati thin films, nanomaterials, porou		colloids and int	erfaces, wetting
Course Learning Outcomes	Understand in     Solve probler thermodynamics     Be familiarized	ompletion of this course, studenterfacial phenomena and their ms in interfacial science and s, and kinetics.  Id with technologies that require, detergency, composite polymers.	origin from molecular of technology by applyir application of interface	ng knowledge of g	
Pre-requisites (and Co-requisites and mpermissible combination)	Pass in CHEM35	541 Physical chemistry II: introd	duction to quantum che	emistry	
Offer in 2014 - 2015	Y 2nd sem			Examination	May
Offer in 2015 - 2016	Υ				
Course Grade	A+ to F				
Grade Descriptors					

	A	Demonstrate thorough knowledge of interfa all of the course learning outcomes. Show s original thought, and ability to apply knowled situations. Critical use of data and sourcing skills.	trong analytical and critical abilities and lo lge to solve problems in a wide range of c	gical thinking, with evidence of omplex, familiar and unfamiliar
	В	Demonstrate substantial knowledge of inta attaining at least most of the course learning thinking, and ability to apply knowledge to sa data and sourcing of references. Apply effective	g outcomes. Show evidence of analytical solve problems in familiar and some unfan	and critical abilities and logical niliar situations. Correct use of
	С	Demonstrate general but incomplete know required for attaining most of the course let and logical thinking, and ability to apply kn some erroneous use of data and references	arning outcomes. Show evidence of some lowledge solve problems to most familiar	analytical and critical abilities situations. Mostly correct but
	D	Demonstrate partial but limited knowledge of attaining some of the course learning outclimited analytical and critical abilities. Show data and source references. Apply limited or	omes. Show evidence of some coherent imited ability to apply knowledge to solve	and logical thinking, but with problems. Limited ability to use
	Fail	Demonstrate little or no evidence of knowled for attaining the course learning outcomes Show very little or no ability to apply knowle presentational skills are minimally effective or	. Lack of analytical and critical abilities, dge to solve problems. Misuse of data and	logical and coherent thinking.
Course Type	Lecture-b	ased course		
Course Teaching	Activities		Details	No. of Hours
& Learning Activities	Lectures	·		36
	Tutorials			12
	Reading / Self study			100
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)
	Assignm	ents	(continuous assessment)	30
	Examina	ation		70
Required/recommended reading and online materials	Barnes a	nd Gentle: Interfacial Science		

CHEM4144 Advanced mate	erials (6 cre	dits)	Academic Year	2014		
Offering Department	Chemistry		Quota	50		
Course Co-ordinator	Prof W K C	han, Chemistry <i>(waichan</i> @hku.hk)				
Teachers Involved		han, Chemistry g, Chemistry				
Course Objectives	overview o	This course is a continuation from Introdution to Materials Chemistry. It provides a more compreheis overview on materials chemistry and application of materials in advanced technology. The most rec development in materials chemistry will also be discussed.				
Course Contents & Topics	polymeriza specialty a polymers,	Advanced polymerization methods: copolymerization and applications of copolymers, coordination polymerization, control of stereochemistry in polymers; ionic and radical living polymerization. Materials specialty applications: high strength materials; high temperature polymers, polyelectrolytes, conduction polymers, optical information storage, sensors, photonics, electronics, nanotechnology. Advancematerials characterization techniques.				
Course Learning Outcomes	Describe     polymeriza	sful completion of this course, students should be able to:  the mechanisms and kinetics of copolymerizations, coctions.  examples of some engineering polymers for high temper	, ,	,		
	how are the 3. Demons	examples of some engineering polymers for high temper pir properties affected by the molecular structures. trate knowledge in advanced materials characterization ted and the working principles of materials for information stora	chniques.	,		
(and Co-requisites and	how are the 3. Demons 4. Understa	eir properties affected by the molecular structures. trate knowledge in advanced materials characterization ted	chniques.	,		
and Co-requisites and mpermissible combination)	how are the 3. Demons 4. Understa	eir properties affected by the molecular structures.  trate knowledge in advanced materials characterization tec and the working principles of materials for information stora  EM3143 Introduction to materials chemistry	chniques.	,		
and Co-requisites and mpermissible combination) Offer in 2014 - 2015	how are the 3. Demons 4. Understa Pass in CH	eir properties affected by the molecular structures.  trate knowledge in advanced materials characterization tec and the working principles of materials for information stora  EM3143 Introduction to materials chemistry	chniques. age and opto-electro	nic applications.		
(and Co-requisites and Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016	how are the 3. Demons 4. Understa Pass in CH	eir properties affected by the molecular structures.  trate knowledge in advanced materials characterization tec and the working principles of materials for information stora  EM3143 Introduction to materials chemistry	chniques. age and opto-electro	nic applications.		
Pre-requisites (and Co-requisites and Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade Grade Descriptors	how are the 3. Demons 4. Understa Pass in CH	eir properties affected by the molecular structures.  trate knowledge in advanced materials characterization tec and the working principles of materials for information stora  EM3143 Introduction to materials chemistry	chniques. age and opto-electro  Examination  Examination  s, concepts, principles, and characterization of ma e and theory relating to novel problems and critical concepts and critical concepts.	May  d theories relating to terials for advanced the synthesis and cal use of data and		
(and Co-requisites and Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade	how are the 3. Demons 4. Understa Pass in CH  Y 2nd  Y A+ to F	peir properties affected by the molecular structures. Itrate knowledge in advanced materials characterization ted and the working principles of materials for information store EM3143 Introduction to materials chemistry  Sem  Demonstrate thorough knowledge and understanding of essential facts frontier approach in polymer synthesis, properties, application, and technology. Show strong ability to apply and integrate knowledge applications of advanced materials. Show strong ability to analyze experimental results to draw appropriate and insightful conclusions or	Examination  Examination  Examination  Examination  Examination  Examination  Examination  Examination  I characterization of mae and theory relating to novel problems and critical relating to advanced manual of essential facts, concapplication, and charact ledge and theory relating well problems and correvel problems and correvel problems and correct ledge and theory relating well problems and correct ledge and theory relating the problems and correct ledge and theory relating the problems and correct ledge and theory relating the problems and correct ledge and the problems and correct ledge and the problems and correct ledge and the problems and correct ledge and the problems and correct ledge and the problems and correct ledge and the problems and correct ledge and the problems and correct ledge and the problems and correct ledge and the problems and correct ledge and the problems and correct ledge and the problems and correct ledge and the problems and correct ledge and the problems and critical ledge and the problems	May  May  May  May  May  May  May  May		

	D	principles, and theories relating to fro characterization of materials for advanced knowledge and theory relating to the synt problems to most familiar situations and mappropriate conclusions relating to advance Demonstrate partial but limited command and theories relating to frontier approach materials for advanced technoloxy. Show 4	I technology. Show evidence of some all hesis and applications of advanced mais sotly correct but erroneous use of data an d materials synthesis and their properties. of knowledge and understanding of essen in polymer synthesis, properties, applica	bilities to apply and integrate rials. Show ability to analyze d experimental results to draw tial facts, concepts, principles, ation, 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-ba	ased course			
Course Teaching	Activities		Details	No. of Hours	
& Learning Activities	Lectures			36	
	Tutorials			12	
	Reading / Self study			100	
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	
	Assignments		(continuous assessment)	20	
	Examinat	ion		80	
Required/recommended reading and online materials		Principles of Polymerizations (John V cialist references will be given through			

CHEM4145 Medicinal cher	mistry (6 cr	dits) Ac	cademic Year	2014		
Offering Department	Chemistry	Qu	uota	140		
Course Co-ordinator	Prof H Z S	ın, Chemistry (hsun@hku.hk)				
Teachers Involved	Prof H Z S Dr H Hu, C	in, Chemistry nemistry				
Course Objectives	research in	This course covers the chemical principles of drug design and drug action and uses as an introduction tresearch in areas of bioorganic chemistry, bioinorganic chemistry, medicinal chemistry, pharmaceutical chemistry, and biotechnology.				
Course Contents & Topics	relationship screening - Drug-reco - Proteins - Metals in - DNA-Dru	<ul> <li>Drug discovery, design, and development: lead discovery, pharmacophore, structure-activity relationships (SAR), computer-aided drug design, combinatorial chemistry and high-throughput druscreening</li> <li>Drug-receptor interactions</li> <li>Proteins (and enzymes) and nucleic acids as drug targets</li> <li>Metals in medicine</li> <li>DNA-Drug interactions</li> <li>Drug metabolism and prodrugs and drug delivery</li> </ul>				
Course Learning Outcomes	On successful completion of this course, students should be able to:  1. Demonstrate knowledge of drug discovery, design and development. 2. Understand drug-biomolecule interactions where appropriate. 3. Gain appropriate knowledge of drug metabolism and drug delivery.					
(and Co-requisites and	3. Gain ap		ry of Biomolecule	es		
(and Co-requisites and impermissible combination)	3. Gain ap	propriate knowledge of drug metabolism and drug delivery.  EM3441 Organic chemistry II or CHEM3442 Organic Chemistr	ry of Biomolecule	es		
(and Co-requisites and Impermissible combination) Offer in 2014 - 2015	3. Gain ap	propriate knowledge of drug metabolism and drug delivery.  EM3441 Organic chemistry II or CHEM3442 Organic Chemistr				
(and Co-requisites and Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016	3. Gain ap Pass in Ch	propriate knowledge of drug metabolism and drug delivery.  EM3441 Organic chemistry II or CHEM3442 Organic Chemistr				
Pre-requisites (and Co-requisites and Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade Grade Descriptors	3. Gain ap Pass in Ch Y 2nd Y	propriate knowledge of drug metabolism and drug delivery.  EM3441 Organic chemistry II or CHEM3442 Organic Chemistr	xamination  ncepts, principles, an e related to drug dis ship; pharmacokineti wledge and theory r e novel problems an is relating to the b	May  d theories relating to covery, design and cs; drug delivery and elating to the basic did critical use of data asic principles and		
(and Co-requisites and Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade	3. Gain appears in Characteristics Y 2nd Y A+ to F	Demonstrate thorough knowledge and understanding of essential facts, con the basic foundation knowledge of medicinal chemistry, especially those development; drug targets; drug lead optimization; structure activity relations its relevance to toxicity. Show strong ability to apply and integrate know foundation knowledge of medicinal chemistry. Show strong ability to analyzand experimental results to draw appropriate and insightful conclusions knowledge of medicinal chemistry. Demonstrate highly effective basic techn	ncepts, principles, an e related to drug dis ship; pharmacokineti wledge and theory re novel problems an s relating to the b niques for medicinal dessential facts, concenistry; especially the ization; structure a ce to apply and integ show evidence to analysions relating to the	d theories relating to covery, design and cos; drug delivery and elating to the basic d critical use of data asic principles and chemistry, especially epts, principles, and see related to drug ctivity relationship; grate knowledge and lyze novel problems basic principles and basic principles and		

		drug discovery; design and development; pharmacokinetics; drug delivery and its relev knowledge and theory relating to the basic problems to most familiar situations and mos appropriate conclusions relating to the ba moderately effective basic techniques, basic metabolism.	ance to toxicity. Show evidence of some foundation knowledge of medicinal chem stly correct but erroneous use of data and sic principles and knowledge of medic	abilities to apply and integrate nistry. Show ability to analyze d experimental results to draw inal chemistry. Demonstrate
	D	Demonstrate partial but limited command of and theories relating to the basic foundatio discovery; design and development; dru pharmacokinetics; drug delivery and its relevknowledge and theory relating to the basic analyze problems to most familiar situations to draw appropriate conclusions relating to the partially effective basic techniques for medicing	n knowledge of medicinal chemistry; esig g targets; drug lead optimization; strance to toxicity. Show evidence of limited foundation knowledge of medicinal chea and mostly correct but erroneous use of he basic principles and knowledge of mec	pecially those related to drug ucture activity relationship; abilities to apply and integrate mistry. Show limited ability to data and experimental results licinal chemistry. Demonstrate
	Fail	Demonstrate little or no evidence of comprinciples, and theories relating to the basic for drug discovery; design and development; pharmacokinetics; drug delivery and its releintegrate knowledge and theory relating to the ability to analyze problems to most familiar appropriate conclusions relating to the baminimally effective basic techniques for media	oundation knowledge of medicinal chemis drug targets; drug lead optimization; s evance to toxicity. Show little or no evid- ne basic foundation knowledge of medicin situations and erroneous use of data and sic principles and knowledge of medic	stry; especially those related to structure activity relationship; ence of abilities to apply and al chemistry. Show little or no al experimental results to draw inal chemistry. Demonstrate
Course Type	Lecture-b	ased course		
Course Teaching	Activitie	S	Details	No. of Hours
& Learning Activities	Lectures			36
	Tutorials			12
	Reading / Self study			100
Assessment Methods and Weighting	Methods	<b>:</b>	Details	Weighting in final course grade (%)
	Assignm	ents	(continuous assessment)	25
	Examina	tion		75
Required/recommended reading and online materials	Medicinal	uction to Medicinal Chemistry (3/e), G.L Chemistry- An Introduction, G. Thomas S.J. Lippard (2004) Nat. Rev. Drug Dis	s, John Wiley, 2000	
Additional Course Information	This corus	se is also offered to rpg students, but th	ne course code for rpg students is	CHEM6113.

CHEM4241 Modern chemica	Il instrumentation and applications (6 credits)	Academic Year	2014					
Offering Department	Chemistry	Quota	50					
Course Co-ordinator	Dr I K Chu, Chemistry (ivankchu@hku.hk)	r I K Chu, Chemistry						
Teachers Involved	Dr I K Chu, Chemistry Dr W T Chan, Chemistry							
Course Objectives	The aim of the course is to provide an understanding of modern instrumentation, covering both fundamental principles and practical aspects of instrument design. The course will be of particular benefit to those pursuing a higher research degree or a career in technical sales/service.							
Course Contents & Topics	Biological Mass spectrometry: Liquid Chromatography-Tandem M Metabolomics.  Laser Spectroscopy: Principle of laser; three-level and four-level lase and frequency conversion); laser-induced fluorescence; laser atomic signal-to-noise enhancement by boxcar integration and photon count Atomic Plasma Spectrometry: Inductively couple plasma-atomic mass spectrometry (ICP-MS); signal-production processes in spectrometer; array detectors; interferences in ICP-AES and ICP-MS Atomic X-ray Spectrometry: x-ray fluorescence; wavelength-dispers (EDXRF) X-ray fluorescence spectrometers	ers; laser instrument c spectrometry; lase ing. mission spectrometr CP spectrometry;	ation (Q-switching r remote sensing ry (ICP-AES) and Echelle grating					
Course Learning Outcomes	On successful completion of this course, students should be able to:  1. Explain the principles of the modern mass spectrometric me identification and quantification.  2. Explain how proteins are identified and sequenced experimen proteomics experiments.  3. Use the database searching techniques and software tools to anal 4. Apply LC/MS/MS method for target quantitative analysis of small n 5. Explain the principles of the laser spectroscopy, atomic plass spectrometry.  6. Describe the basic experimental set up and the properties of the used in the laboratory classes.	tally and how data yze high-throughput nolecules. ma spectrometry, a	a is generated in proteomics data.  and atomic x-ray					
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in CHEM3241 Analytical chemistry II: chemical instrumentation							
Offer in 2014 - 2015	Y 1st sem	Examination	Dec					
Offer in 2015 - 2016	Y							

Grade Descriptors	A	Demonstrate thorough knowledge and under the modern chemical instrumentations and a theory, and strong ability to analyze problem design.	applications. Show strong ability to apply	and integrate knowledge and
	В	Demonstrate substantial command of know theories relating to the modern chemical ins knowledge and theory, and ability to analyz instrument design.	strumentations and applications. Show ev	vidence to apply and integrate
	С	Demonstrate general but incomplete comprinciples and theories relating to the moder abilities to apply and integrate knowledge fundamental principles and practical aspects	rn chemical instrumentations and applicate and theory, and to analyze problems	tions. Show evidence of some
	D	Demonstrate partial but limited command of and theories relating to the modern chemica apply and integrate knowledge and theory, a to fundamental principles and practical aspec	I instrumentations and applications. Show and limited ability to analyze problems to a	evidence of limited abilities to
	Fail	Demonstrate little or no evidence of comprinciples and theories relating to the modern of abilities to apply and integrate knowledge situations related to fundamental principles a	n chemical instrumentations and application and theory, and little or no ability to ana	ons. Show little or no evidence lyze problems to most familiar
Course Type	Lecture wit	th laboratory component course		
Course Teaching	Activities	•	Details	No. of Hours
& Learning Activities	Lectures			24
	Laborator	у		16
	Tutorials			12
	Reading /	Self study		100
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)
	Assignme	nts	(continuous assessment)	30
	Examinati	on		70
Required/recommended reading and online materials		ass: Fundamentals of contemporary m g, F.K. Holler, S.R. Crouch: Principles		
Additional Course Information		to published material will be made thr classes are mandatory. Students mourse.		and laboratory reports to

CHEM4242 Analytical chei	mistry (6 credits)	Academic Year	2014
Offering Department	Chemistry	Quota	50
Course Co-ordinator	Dr K M Ng, Chemistry (kwanmng @hku.hk)		
Teachers Involved	Dr K M Ng, Chemistry		
Course Objectives	This course focuses on the basic principle, practice and meth- analysis. The course emphasizes on the integration of analytical practical analytical and bioanalytical problems. This course will be to pursue their career related to analytical and bioanalytical chemis	I concepts and tech particularly useful for	nologies to solve
Course Contents & Topics	Analytical measurement concepts: Statistical treatment & evalua Figures of merits of analytical methods; Validation of analytical manalysis and testing laboratories  Theoretical background and practical techniques of sample prepara preparation and enrichment techniques for biomedical, pharmace Advanced separation technologies for complex mixture analysis (emethods for chromatographic analysis and spectroscopic detection techniques based on mass spectrometry	ethods; Quality assu ation, separation and cutical and forensic c .g. multidimensional l ction; Analytes cha	rance in chemica detection: Sample chemical analysis LC); Derivatization racterization and
	Problem-based design of analytical strategy for chemical & bic practical knowledge and experience related to selected fields of analytical chemistry literature/ scenario.		
Course Learning Outcomes	On successful completion of this course, students should be able to 1. apply statistical methods to assess analytical measurement data validate analytical methods and results 2. demonstrate understanding on the working principle of different their advantages and limitations 3. integrate different analytical techniques to solve analytical and bi	quality and interpret	Ü
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in CHEM3241 Analytical chemistry II: chemical instrument analysis	ation or CHEM3242	Food and wate
Offer in 2014 - 2015	Y 2nd sem	Examination	May
		-	
Offer in 2015 - 2016	Υ		

Grade Descriptors	A	course learning outcomes. Show strong ar	ced level of extensive knowledge and skills re nalytical and critical abilities, logical thinking omplex issues and problems related to chemi as shown in class work.	and capability to apply
	В	the course learning outcomes. Show evider	pad range of knowledge and skills required for noe of analytical and critical abilities, logical to ge of complex issues and problems related to as shown in class work.	hinking, and capability to
	С	outcomes. Show evidence of analytical and	rledge and skills required for attaining mos critical abilities, logical thinking, and ability to problems related to chemical analysis. Apply	apply knowledge learnt to
	D	learning outcomes in Food and Water Ana limited analytical and critical abilities. Show	d of knowledge and skills required for attair lysis. Show evidence of some coherent and imited ability to apply knowledge to solve pro anization and presentation skill as shown in cla	logical thinking, but with blems related to chemical
	Fail	outcomes. Lack of analytical and critical abili	nmand of knowledge and skills required for att ties, logical and coherent thinking. Show very hemical analysis. Organization and presenta k.	little or no ability to apply
Course Type	Lecture wit	th laboratory component course		
Course Teaching	Activities		Details	No. of Hours
& Learning Activities	Lectures			24
	Laborator	y	6 x 4-hour of laboratory practical	24
	Tutorials			6
	Reading /	Self study		100
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)
	Assignme	nts		5
	Examinati	on		70
	Laborator	y reports	Experiment & Lab report	15
	Test		Test/Quiz	10
Required/recommended reading and online materials		og, D. M. West, F. J. Holler, S.R. Catest edition)	Crouch: Fundamentals of Analytical	Chemistry (Cengage
Additional Course Information		s to specialist texts and other publishe classes are mandatory. Students mourse.		

CHEM4341 Advanced inor	ganic chemistry	(6 credits)		Academic Year	2014
Offering Department	Chemistry			Quota	60
Course Co-ordinator	Prof C M Che, Ch	nemistry (cmche@hku.hk)			
Teachers Involved	Prof C M Che, Ch Prof V W W Yam, Prof H Z Sun, Che	, Chemistry			
Course Objectives	treatment to topic	continuation from Intermediate Inores in Inorganic Chemistry and new are ill be introduced in the later part of the continuation.	eas of interest.	Problem based lea	arning on selecte
Course Contents & Topics	multiple bonds, in	ed topics of current interest. Exam norganic and supramolecular photoc try, and activation of small molecules	chemistry, lanth	nanide chemistry, l	
Course Learning Outcomes	<ol> <li>Understand the bonded metal con</li> <li>Understand the</li> <li>Understand an importance of sucreactions.</li> <li>Introduction to science, catalysis</li> </ol>	mpletion of this course, students shounded electronic structure and bonding mplexes. The principles and concepts of inorganic directive the activation of small mole chactivation in chemical catalysis of the chemistry of lanthanide coordinated and biomedical sciences. The role of metal complexes in bio-inorganic catalysis of the chemistry of lanthanide coordinates and biomedical sciences.	as of novel met and supramole ecules by transit global interest, action compound	cular photochemistion metal complex green chemistry a	try. es and realize th and energy savin
Pre-requisites (and Co-requisites and Impermissible combination)		41 Inorganic chemistry II ongly recommended to take CHEM41 course.)	142 Symmetry,	group theory and a	applications if the
Offer in 2014 - 2015	Y 1st sem			Examination	Dec
Offer in 2015 - 2016	Υ				
Course Grade	A+ to F				
Grade Descriptors	Demo	nstrate thorough knowledge and understanding	ng of essential facts,	, concepts, principles ar	nd theories relating to

	A	the frontiers in inorganic chemistry. Show stron ability to analyze novel problems in inorganic c skills.		
	В	Demonstrate substantial command of knowledg theories relating to the more advanced knowled knowledge and theory, and ability to analyze no and presentational skills.	dge in inorganic chemistry. Show evidence	e to apply and integrate
	С	Demonstrate general but incomplete command principles and theories relating to the more advabilities to apply and integrate knowledge and inorganic chemistry. Apply moderately effective or	ranced knowledge in inorganic chemistry.  If theory, and to analyze problems to m	Show evidence of some
	D	Demonstrate partial but limited command of kno and theories relating to the more advanced know apply and integrate knowledge and theory, and inorganic chemistry. Demonstrate partially effective	wledge in inorganic chemistry. Show evided limited ability to analyze problems to m	ence of limited abilities to nost familiar situations in
	Fail	Demonstrate little or no evidence of command principles and theories relating to the more advar abilities to apply and integrate knowledge and t situations in inorganic chemistry. Demonstrate m	nced knowledge in inorganic chemistry. Sh theory, and little or no ability to analyze p	ow little or no evidence of problems to most familiar
Course Type	Lecture-ba	sed course		
Course Teaching & Learning Activities	Activities		Details	No. of Hours
& Learning Activities	Lectures			36
	Tutorials		ncluding literature survey & oresentation	12
	Reading /	Self study		100
Assessment Methods and Weighting	Methods	С	Details	Weighting in final course grade (%)
	Assignme	nts	continuous assessment)	20
	Examinat	on		80
Dogwing d/management dod	F.A. Cotto	n, G. Wilkinson, Hurillo and Bochmann: A	dvance Inorganic Chemistry (Wile	y, 1999, 6th ed.)
Required/recommended reading and online materials				

CHEM4342 Organometal	lic chemistry	/ (6 credits)	Academic Year	2014
Offering Department	Chemistry		Quota	40
Course Co-ordinator	Prof V W \	N Yam, Chemistry (wwyam@hku.hk)		
Teachers Involved		N Yam, Chemistry -Yeung, Chemistry		
Course Objectives	Chemistry	rther, more detailed, treatment to organometa II. The course also aims to introduce and and to prepare students for graduate work in	d familiarize students with adv	anced laborator
Course Contents & Topics		Main group and transition metal organometal and reactivities of organometallics. Application		
	synthesis	r: To introduce and familiarize students with a and manipulation of air- and moisture- sen ectroscopic methods.		
Course Learning Outcomes	On succes	sful completion of this course, students should	d be able to:	
	2. Demons transition i metal alky 3. Demons polymeriza 4. Demons	and the advanced principles and concepts in c strate knowledge and understanding in the bor metal organometallics, especially in transition lidynes. strate knowledge and understanding in the ap ation and catalysis. strate ability in advanced laboratory technique ure-sensitive compounds, and their characterization.	nding, structure and reactivities of metal clusters, metal alkyls, metal poplication of organometallics in the sincluding the synthesis and metallics and metallics in the synthesis and metallics.	al alkylidenes an organic synthesinanipulation of a
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in Ch	HEM3341 Inorganic chemistry II		
Offer in 2014 - 2015	Y 1st	sem	Examination	Dec
Offer in 2015 - 2016	Υ		·	
Course Grade	A+ to F			
Grade Descriptors	A	Demonstrate thorough knowledge and understanding of the more detailed and advanced treatment of organome and reactivities of main group and transition metal application of organometallics in organic synthesis	etallic chemistry, especially those related organometallics; transition metal clu	d to structure, bondir ister chemistry; an

		sensitive compounds and their	r characterization by various spectroscopic method	ds.
	В	theories relating to the more to structure, bonding and rechemistry; and application o integrate knowledge and theoevidence to analyze novel conclusions relating to the adadvanced laboratory skills a	mand of knowledge and understanding of essen detailed and advanced treatment of organometallic activities of main group and transition metal orga f organometallics in organic synthesis and catal ry relating to the advanced principles and concept problems and correct use of data and experin vanced principles and applications of organometa nd techniques, especially in the synthesis and r characterization by various spectroscopic method	c chemistry, especially those related nometallics; transition metal cluster ysis. Show evidence to apply and s of organometallic chemistry. Show nental results to draw appropriate lic chemistry. Demonstrate effective manipulation of air- and moisture-
	С	principles, and theories relatir those related to structure, be metal cluster chemistry; and some abilities to apply and i organometallic chemistry. St erroneous use of data and ex and applications of organom	complete command of knowledge and understar ig to the more detailed and advanced treatment of onding and reactivities of main group and transiti application of organometallics in organic synthes negrate knowledge and theory relating to the an low ability to analyze problems to most familiar sperimental results to draw appropriate conclusion- tetallic chemistry. Demonstrate moderately effect esynthesis and manipulation of air- and moistu- ectroscopic methods.	organometallic chemistry, especially on metal organometallics; transition is and catalysis. Show evidence of dvanced principles and concepts of situations and mostly correct but s relating to the advanced principles ive advanced laboratory skills and
	D	and theories relating to the related to structure, bonding cluster chemistry; and applicabilities to apply and integrorganometallic chemistry. She erroneous use of data and exand applications of organor	ed command of knowledge and understanding of omore detailed and advanced treatment of organo and reactivities of main group and transition metaition of organometallics in organic synthesis and rate knowledge and theory relating to the advow limited ability to analyze problems to most fami perimental results to draw appropriate conclusion: netallic chemistry. Demonstrate partially effective synthesis and manipulation of air- and moisturectroscopic methods.	metallic chemistry, especially those tail organometallics; transition metal catalysis. Show evidence of limited anced principles and concepts of liar situations and mostly correct but s relating to the advanced principles e advanced laboratory skills and
	Fail	principles, and theories relating those related to structure, but metal cluster chemistry; and evidence of abilities to apply a organometallic chemistry. Shoof data and experimental result of organometallic chemistry.	dence of command of knowledge and understang to the more detailed and advanced treatment of onding and reactivities of main group and transiti application of organometallics in organic synthe and integrate knowledge and theory relating to the owl little or no ability to analyze problems to most fills to draw appropriate conclusions relating to the appearance of the commonstrate minimally effective advanced laborate ation of air- and moisture- sensitive compounds a	organometallic chemistry, especially on metal organometallics; transition sis and catalysis. Show little or no advanced principles and concepts of amiliar situations and erroneous use advanced principles and applications ory skills and techniques, especially
Course Type	Lecture w	ith laboratory component o	ourse	
Course Teaching	Activitie	S	Details	No. of Hours
& Learning Activities	Lectures			24
	Laborato	ry		30
	Tutorials			5
	Reading	/ Self study		100
Assessment Methods and Weighting	Methods	3	Details	Weighting in final course grade (%)
	Assignm	ents	(continuous assessment)	30
	Examina	tion		70
Required/recommended reading and online materials			Chemistry of the Transition Metals (Wiley Organometallics - A Concise Introduction	
Additional Course Information		y classes are mandatory.	er published materials will be made throu Students must complete ALL experime	

CHEM4441 Advanced orga	anic chemistry (6 credits)	Academic Year	2014
Offering Department	Chemistry	Quota	80
Course Co-ordinator	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 structure determination.	mechanisms and o	rganic compound
Course Contents & Topics	The course covers chemical bonding, advanced stereochemistry, c investigating reaction mechanisms, reactive intermediates, rearreactions.		
Course Learning Outcomes	On successful completion of this course, students should be able to:  1. Describe, analyze and interpret the structure and reactivity relation.  2. Identify and predict the selectivities (chemoselectivity, regioselect reactions.  3. Describe the general approaches to study organic mechanisms.  4. Have a general understanding and working knowledge of perior (radicals, carbenes and nitrenes), and polar rearrangements.  5. Suggest reasonable mechanistic pathways for some types of organic forms.	nship of organic mole stivity and stereosele yelic reactions, reactions.	ectivity) in organic
Pre-requisites	Pass in CHEM3441 Organic chemistry II		
	400		

(and Co-requisites and Impermissible combination)						
Offer in 2014 - 2015	Y 19	st sem			Examination	Dec
Offer in 2015 - 2016	Υ					
Course Grade	A+ to F					
Grade Descriptors	A	course learning	orough mastery at an adva outcomes. Show strong a lity to apply knowledge to	nalytical and critical abiliti	es and logical thinking,	with evidence of original
	В	the course learn	bstantial command of a bing outcomes. Show evice to familiar and some unfa	dence of analytical and cr		
	С	learning outcom	neral but incomplete com es. Show evidence of sor ost familiar situations.			
	D	outcomes. Show	rtial but limited command v evidence of some cohe lity to apply knowledge to	erent and logical thinking,		
	Fail		le or no evidence of com of analytical and critical a lve problems.			
Course Type	Lecture-	based course				
Course Teaching	Activiti	es		Details		No. of Hours
& Learning Activities	Lecture	S				36
	Tutorial	S				12
	Reading	g / Self study				100
Assessment Methods and Weighting	Method	ls		Details		Weighting in final course grade (%)
	Assignr	nents		(continuous asse	essment)	30
	Examin	ation				70
Required/recommended reading and online materials	Springer J. McMu	r, 2007. rry, "Organic Che	oerg, "Advanced Orgenistry", 8th Ed., Tho actions", Oxford University	mson Brooks/Cole, 2		lechanism", 5th Ed.:

CHEW4443 Integrated org	anic synthesis (6 credits)	Academic Year	2014
Offering Department	Chemistry	Quota	50
Course Co-ordinator	Prof P Chiu, Chemistry (pchiu@hku.hk)		
Teachers Involved	Prof P Chiu, Chemistry		
Course Objectives	To introduce aspects of modern organic reactions with releval natural products, drugs and medicinal chemistry to provide ar provide training in advanced organic laboratory skills, and fur characterization, as preparation for graduate studies or researce	n integrated approach to the thickness in the integrated approach to the integral of the integ	he subject, and t
Course Contents & Topics	Building on the organic chemistry covered in the foundational course will present modern synthetic methods and synthetic plased on target drug molecules. In each unit, the chemical presented and the syntheses of these molecules are introduced the reactions involved with emphasis on their mechanisms limitations. Concept of synthetic design including retrost enantioselective control elements will be emphasized. A la practical skills of synthesis.	planning. The course is or al biology of these comp ed, accompanied by in-de s, selectivity, stereochem synthetic analysis, stere	ganized into unit ounds are briefly pth discussions of istry, scope and oselectivity and
Course Learning Outcomes	On successful completion of this course, students should be al	-1- 4	
	Understand the conditions, selectivities, mechanisms of sev.     Apply the knowledge of organic reactions toward solving pro-	eral classes of important re	
Pre-requisites (and Co-requisites and	Understand the conditions, selectivities, mechanisms of seving several sections.	eral classes of important re	
Pre-requisites and Co-requisites and mpermissible combination)	Understand the conditions, selectivities, mechanisms of sev.     Apply the knowledge of organic reactions toward solving pro-	eral classes of important re	
Pre-requisites and Co-requisites and mpermissible combination) Offer in 2014 - 2015	Understand the conditions, selectivities, mechanisms of sev.     Apply the knowledge of organic reactions toward solving propagation.  Pass in CHEM3441 Organic chemistry II	eral classes of important rebblems in synthesis and sy	nthetic design.
Pre-requisites (and Co-requisites and Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade	Understand the conditions, selectivities, mechanisms of sev.     Apply the knowledge of organic reactions toward solving property.  Pass in CHEM3441 Organic chemistry II  Y 2nd sem	eral classes of important rebblems in synthesis and sy	nthetic design.
Pre-requisites (and Co-requisites and Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016	Understand the conditions, selectivities, mechanisms of sev.     Apply the knowledge of organic reactions toward solving property.  Pass in CHEM3441 Organic chemistry II  Y 2nd sem	eral classes of important residence in synthesis and synthesis and synthesis and synthesis and synthesis and synthesis and synthesis and understanding of stry. Show a strong ability to intechemistry situations and problem and complex synthetic problems and complex synthetic problems.	May  concepts, principles egrate knowledge and s. Show a critical us.

	С	Demonstrate a general but incomplete com and mechanisms related to synthetic organ theory, and evidence of some ability to anal use of knowledge to apply to the solution of and application of lab skills and techniques i	ic chemistry. Show evidence of yze synthetic organic chemistry most familiar problems. Demo	some ability to integrate knowledge and situations and problems. Show a correct
	D	Demonstrate a partial but limited command mechanisms related to synthetic organic of theory, and a limited ability to analyze fam knowledge to apply to the solution of mo application of lab skills and techniques in syn	nemistry. Show evidence of a li iliar situations and problems. S st familiar problems. Demonst	mited ability to integrate knowledge and show some correct but erroneous use of
	Fail	Demonstrate little or no evidence of comm and mechanisms related to synthetic organ and theory in synthetic organic chemistry, Show mostly erroneous use of knowledge effective organization and application of lab	ic chemistry. Show little or no e and little or no ability to analyz to apply to the solution of fa	evidence of ability to integrate knowledge e most familiar situations and problems. miliar problems. Demonstrate minimally
Course Type	Lecture	with laboratory component course		
Course Teaching & Learning Activities	Activities		Details	No. of Hours
& Learning Activities	Lectures			24
	Laborat	ory		25
	Reading	g / Self study		100
Assessment Methods and Weighting	Method	s	Details	Weighting in final course grade (%)
	Examin	ation		65
	Laborat	ory reports		25
	Test			10
Required/recommended reading and online materials		synthesis, C. Willis, M. Wills, Oxford Sc s, top synthetic routes, J. Saunders, Ox		s
Additional Course Information	Laborato	ry classes are mandatory. Students no course.	nust complete ALL exper	riments and laboratory reports to

r X C Li, Che understand generate ology, medic hemical biologemistry, che n successful Understand Give exampith altered fur Compare ch	emistry (xuechenl@hku.hk) emistry d how to use chemical approaches to emulate biological new functional molecules. Useful as an introduction cinal chemistry and biotechnology.  Togy of nucleic acids, protein chemistry, protein posttransion glycobiology and tools and techniques in chemical completion of this course, students should be able to: I chemical biology approaches in studying biology.  Toles of how to use chemical methods to produce natural broadings.  The medical biology and traditional biology approaches in drugstated to the state of t	to research in a slational modification biology.	reas of chemica
r X C Li, Che o understand nd generate ology, medic hemical biolo nemistry, che n successful Understand Give examp iht altered fur Compare ch ass in CHEM	emistry d how to use chemical approaches to emulate biological new functional molecules. Useful as an introduction cinal chemistry and biotechnology.  ogy of nucleic acids, protein chemistry, protein posttranslemical glycobiology and tools and techniques in chemical completion of this course, students should be able to: I chemical biology approaches in studying biology.  oles of how to use chemical methods to produce natural binctions.  nemical biology and traditional biology approaches in drug draditional chemistry II or BIOC3601 Metabolism	to research in a slational modification biology.	reas of chemica
o understand nd generate ology, medic hemical biolo nemistry, che n successful Understand Give examp iht altered fur Compare ch	d how to use chemical approaches to emulate biological new functional molecules. Useful as an introduction cinal chemistry and biotechnology.  The property of nucleic acids, protein chemistry, protein posttranslemical glycobiology and tools and techniques in chemical completion of this course, students should be able to:  I chemical biology approaches in studying biology. Dies of how to use chemical methods to produce natural broadings. The process of the produce of	to research in a slational modification biology.	reas of chemica
nd generate ology, medic hemical biologhemistry, che in successful Understand Give exampith altered fur Compare chass in CHEM	new functional molecules. Useful as an introduction cinal chemistry and biotechnology.  Togy of nucleic acids, protein chemistry, protein posttransismical glycobiology and tools and techniques in chemical completion of this course, students should be able to:  I chemical biology approaches in studying biology. Dies of how to use chemical methods to produce natural brottons.  The methods in the method of the produce in drug approaches in drug and traditional biology approaches in drug and tradi	to research in a slational modification biology.	reas of chemica
nemistry, che n successful Understand Give examp int altered fur Compare ch ass in CHEM	emical glycobiology and tools and techniques in chemical completion of this course, students should be able to:  I chemical biology approaches in studying biology.  Dies of how to use chemical methods to produce natural brottons.  The memical biology and traditional biology approaches in drug alternative the memical biology and traditional biology approaches in drug alternative the memical biology and traditional biology approaches in drug alternative the memical biology and traditional biology approaches in drug alternative the memical biology approaches in drug alternative the memical biology approaches in drug alternative the memical biology approaches in drug alternative the memory and traditional biology approaches in drug alternative the memory and the me	biology.	
Understand Give examp iht altered fur Compare ch ass in CHEM	I chemical biology approaches in studying biology.  bles of how to use chemical methods to produce natural biologs.  netions.  nemical biology and traditional biology approaches in drug  //3441 Organic chemistry II or BIOC3601 Metabolism		new biomolecule
2nd sem			
	П	Examination	May
+ to F			
co tho eff	ourse learning outcomes. Show strong analytical and critical abilities ar ought, and ability to apply knowledge to a wide range of complex, fam fective organizational and presentational skills. Insightful use and critica	ınd logical thinking, witl miliar and unfamiliar sit	h evidence of origina tuations. Apply highl
the ap Cri	e course learning outcomes. Show evidence of analytical and critical oply knowledge to familiar and some unfamiliar situations. Apply effect ritical use of relevant information from sources, showing ability to make	l abilities and logical the tive organizational and	hinking, and ability to I presentational skills
lea kn rel	arning outcomes. Show evidence of some analytical and critical abilitinowledge to most familiar situations. Apply moderately effective organ elevant information from sources, showing ability to make comparison	ies and logical thinking inizational and present	g, and ability to appl tational skills. Use o
ou Sh pre	utcomes. Show evidence of some coherent and logical thinking, but how limited ability to apply knowledge to solve problems. Apply limi resentational skills. Use and reference of several sources, but mainly	with limited analytical nited or barely effective	and critical abilities e organizational and
	CC the first the	course learning outcomes. Show strong analytical and critical abilities at thought, and ability to apply knowledge to a wide range of complex, far effective organizational and presentational skills. Insightful use and critic from a full range of high quality sources and to quote/reference aptly.  Demonstrate substantial command of a broad range of knowledge and the course learning outcomes. Show evidence of analytical and critica apply knowledge to familiar and some unfamiliar situations. Apply effect Critical use of relevant information from sources, showing ability to mak secondary interpretations and to quote/reference aptly.  Demonstrate general but incomplete command of knowledge and skill learning outcomes. Show evidence of some analytical and critical abilitik knowledge to most familiar situations. Apply moderately effective organized relevant information from sources, showing ability to make compariso quote/reference aptly.  Demonstrate partial but limited command of knowledge and skills require outcomes. Show evidence of some coherent and logical thinking, but Show limited ability to apply knowledge to solve problems. Apply limpresentational skills. Use and reference of several sources, but mainly comparison.  Demonstrate little or no evidence of command of knowledge and skills.	course learning outcomes. Show strong analytical and critical abilities and logical thinking, wit thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar si effective organizational and presentational skills. Insightful use and critical analysis / evaluatior from a full range of high quality sources and to quote/reference aptly.  Demonstrate substantial command of a broad range of knowledge and skills required for atta the course learning outcomes. Show evidence of analytical and critical abilities and logical that apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and Critical use of relevant information from sources, showing ability to make meaningful comparis secondary interpretations and to quote/reference aptly.  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 most familiar situations. Apply moderately effective organizational and presen relevant information from sources, showing ability to make comparisons between different i quote/reference aptly.  Demonstrate partial but limited command of knowledge and skills required for attaining some outcomes. Show evidence of some coherent and logical thinking, but with limited analytical Show limited ability to apply knowledge to solve problems. Apply limited or barely effective presentational skills. Use and reference of several sources, but mainly through summary rate

	Fail	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. Limited use of secondary sources and no critical comparison of them.		
Course Type	Lecture-ba	ased course		
Course Teaching & Learning Activities	Activities	s	Details	No. of Hours
& Learning Activities	Lectures			36
	Tutorials			12
	Reading / Self study			100
Assessment Methods and Weighting	Methods	•	Details	Weighting in final course grade (%)
	Examina	tion		60
	Test		tests & presenations	40
Required/recommended reading and online materials	Foundatio	ns of Chemical Biology by C.M	1. Dobson, J.A. Gerrard and A.J. Pratt.	

CHEM4541 Physical cher theory (6 credits)	nistry III: sta	atistical thermodynamics and kinet	tic Acad	emic Year	2014
Offering Department	Chemistry	,	Quot	а	40
Course Co-ordinator	Dr H Hu, 0	Chemistry (haohu@hku.hk)			
Teachers Involved	Dr H Hu, (	Chemistry			
Course Objectives		e presents fundamental principles and top rovide a solid foundation for students inter lds.			
Course Contents & Topics	- Thermoder - Ensembler - Systems - Molecular - Ideal gas - Lattice strength - Quantum	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 kinetic theory - Rate theory: collision theory, transition state theory			
Course Learning Outcomes	1. Unders discussed 2. Demon	On successful completion of this course, students should be able to:  1. Understand and use the terminology and nomenclature in statistical thermodynamics and topics discussed in the course.  2. Demonstrate knowledge and understanding of basic concepts in statistical thermodynamics.  3. Understand correlation between macroscopic observables and microscopic statistical model systems.			
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in Cl	Pass in CHEM3541 Physical chemistry II: introduction to quantum chemistry			
Offer in 2014 - 2015	Y 2nd	Isem	Exam	nination	May
Offer in 2015 - 2016	Υ				
Course Grade	A+ to F				
Grade Descriptors	A	A Thorough mastery at an advanced level of extensive knowledge of statistical thermodynamics and reaction dynamics. Demonstrate evidence of strong analytical / critical abilities and logical thinking. Can apply the knowledge to practical questions in Physical Chemistry.			
	В	<b>B</b> Substantial command of knowledge of statistical thermodynamics and reaction dynamics. Demonstrate evidence of analytical / critical abilities and logical thinking. Understand the scope of Physical Chemistry questions that can be applied with the knowledge.			
	С	C General but incomplete command of knowledge of statistical thermodynamics and reaction dynamics. Demonstrate evidence of analytical thinking. Can apply the knowledge to familiar situations.			
	D	Partial but limited command of knowledge of k Demonstrate limited evidence of analytical thinking			
	Fail	Little or no evidence of command of knowledge of	statistical thermodynamics a	and reaction dyr	namics.
Course Type	Lecture w	ith laboratory component course			
Course Teaching	Activities	s D	etails		No. of Hours
& Learning Activities	Lectures				24
	Laborato	ry			24
	Tutorials				6
	Reading	/ Self study			100

and Weighting			course grade (%)	
	Assignments	continuous assessment of on class quizzes & assignments	40	
	Examination		60	
Required/recommended reading and online materials	T. L. Hill, An introduction to Statistical Thermodynamics P. Atkins, Physical Chemistry			
Additional Course Information	Laboratory classes are mandatory. Students must complete ALL experiments and laboratory reports to pass this course.			

CHEM4542 Computational	Chemistry	(o credits)		Academic Year	2014
Offering Department	Chemistry	,		Quota	60
Course Co-ordinator	Prof G H (	Chen, Chemistry (ghc@yangtze.hku.	hk)		
Teachers Involved	Prof G H ( Dr H Hu, (	Chen, Chemistry Chemistry			
Course Objectives	dynamics	se covers topics in computational of methods. It is offered to undergrad computational physics and computational physics a	uate and postgraduate		
Course Contents & Topics		ock molecular orbital method, dens ds, QM/MM method, free energy cal			
Course Learning Outcomes	On succes	ssful completion of this course, stude	ents should be able to:		
	<ol> <li>Understances</li> <li>Employ</li> </ol>	Understand the basic concepts of density-functional theory.     Understand the basic numerical techniques of molecular mechanics method and quantum mechanics/molecular mechanics method.     Employ the existing computational software to calculate the chemical, physical properties of various molecular systems include organic molecules, inorganic materials and biomolecules.			
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in C mechanics	CHEM3541 Physical chemistry II: ir s.	troduction to quantum	n chemistry or PH	YS3351 Quantum
Offer in 2014 - 2015	Y 2nd	2nd sem Examinatio			May
Offer in 2015 - 2016	N	N			
Course Grade	A+ to F				
Grade Descriptors	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.				
	С	Command of knowledge on following topics: density-functional theory, Kohn-Sham equation, time-dependent density-functional theory, open system, molecular dynamics, force field, and quantum mechanics/molecular mechanics. Evidence of some analytical and critical abilities and logical thinking, with ability to apply knowledge to familiar problems in physical chemistry.			
	D	Partial but limited command of knowledge on following topics: density-functional theory, Kohn-Sham equation, time-dependent density-functional theory, open system, molecular dynamics, force field, and quantum mechanics/molecular mechanics. Evidence of some coherent analytical and critical abilities and logical thinking, with limited ability to apply knowledge to practical problems in physical chemistry.			
	Fail	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 wi	ith laboratory component course			
Course Teaching	Activities	3	Details		No. of Hours
& Learning Activities	Lectures				24
	Laborator	ry	lab sessions 6x computational laboration		24
	Tutorials			,	6
	Reading /	/ Self study			100
Assessment Methods and Weighting	Methods		Details		Weighting in fina course grade (%
	Assignme	ents	(continuous asses		30
	Examinat		,	,	70
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 phys	sical chemi	stry (6 credits)		Academic Year	2014
Offering Department	Chemistry			Quota	80
Course Co-ordinator	Prof G H C	Chen, Chemistry (ghc@yangtze.hku.hl	k)		
Teachers Involved	Prof G H C Prof D L P	Chen, Chemistry hillips, 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:  - Understand the basic concepts of quantum chemistry, statistical thermodynamics and molecular dynamics;  - Understand Hartree-Fock method, statistical ensembles, quantum statistics, H-theorem, and reaction dynamics;  - Understand the elementary numerical procedures in Hartree-Fock and molecular mechanics methods				rem, and reaction
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in Ch	HEM3541 Physical chemistry II: introd	uction to quantum ch	emistry	
Offer in 2014 - 2015	Y 2nd	sem		Examination	May
Offer in 2015 - 2016	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 of analytical and critical abilities and logical thinking, with ability to apply knowledge to practical problems in physical chemistry.				
	С	Command of knowledge on following topics: variation method in quantum mechanics, Hartree-Fock method, perturbation theory, advanced statistical thermodynamics, reaction dynamics. Evidence of some analytical and critical abilities and logical thinking, with ability to apply knowledge to familiar problems in physical chemistry.			
	D	Partial but limited command of knowledge on following topics: variation method in quantum mechanics, Hartree-Fock method, perturbation theory, advanced statistical thermodynamics, reaction dynamics. Evidence of some coherent analytical and critical abilities and logical thinking, with limited ability to apply knowledge to practical problems in physical chemistry.			
	Fail	Little or no evidence of command of knowledge on following topics: variation method in quantum mechanics, Hartree-Fock method, perturbation theory, advanced statistical thermodynamics, reaction dynamics. Lack of analytical and critical abilities and logical thinking, with very little or no ability to apply knowledge to practical problems in physical chemistry.			
Course Type	Lecture-ba	sed course			
Course Teaching	Activities	;	Details		No. of Hours
& Learning Activities	Lectures		-		36
	Tutorials				12
	Reading / Self study				100
Assessment Methods and Weighting	Methods	·	Details		Weighting in final course grade (%)
	Assignme	ents	(continuous asses		20
	-	Examination			80
Required/recommended reading and online materials	Ira N. Levii R. C. Tolm	P. W. Atkins: Physical Chemistry Ira N. Levine: Quantum Chemistry (Prentice Hall, 4th ed.) R. C. Tolman: The Principles of Statistical Mechanics R. D. Levine, R. B. Bernstein: Molecular Reaction Dynam			
Course Website	Nil				
Additional Course Information	Nil				

CHEM4910 Chemistry literacy and research (6 credits)		Academic Year	2014		
Offering Department	Quota				
Course Co-ordinator	Dr X Li, Chemistry (xiangli @hku.hk)	Dr X Li, Chemistry (xiangli@hku.hk)			
Teachers Involved	Nil, 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 successful completion of this course, students should be able to:  1. Demonstrate knowledge of academic databases and search engines of chemistry literature 2. Understand the terminology and nomenclature associated with their own research project 3. Demonstrate knowledge and understanding of the chemical techniques they used to do the research in their own research project 4. Demonstrate knowledge and understanding of the results of their own research project and its context in the broader research area				
Pre-requisites (and Co-requisites and Impermissible combination)	CHEM4XX instrument CHEM354	Pass in at least 24 credits of advanced level compulsory/core 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 II: introduction to quantum chemistry. This capstone course is for Chemistry Major students only.			
Offer in 2014 - 2015	Y 2nd	sem	Examination	No Exam	
Offer in 2015 - 2016	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.]				
	B Show a substantial comprehension of the research project. Demonstrate able analytical and critical thinking with use of relevant information from sources. Demonstrate ability to compose meaningful comparisons between different secondary interpretations. Correct utilization of data and results to form appropriate conclusions. Compose general integration of theories, principles, data and methods. Perform effective organizational and presentational skills.				
	C Show a general but incomplete comprehension of the research project. Presence of some analytical and critical thinking with use of relevant information from sources. Demonstrate ability to compose comparisons between different interpretations. Mainly correct but some incorrect utilization of data and results to form appropriate conclusions. Demonstrate some partial integration of theories, principles, data and methods. Perform moderately effective organizational and presentational skills.				
	D	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 emplincorrectly utilize data and results and/or unat of theories, principles, data and methods. Org	oyment of secondary sources and no criti ole to form appropriate conclusions. Demons	cal comparison of them. trate little or no integration	
Course Type	Laboratory	and workshop course			
Course Teaching	Activities	<b>.</b>	Details	No. of Hours	
& Learning Activities	Laborator	у		50	
	Tutorials			6	
	Reading /	Self study		100	
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	
	Presentat	ion	written reports and presentations	100	
Required/recommended reading and online materials	Reading m	naterials will be assigned depending on	the project.		
Additional Course Information		are expected to have satisfactorily com		ory completion of this	

CHEM4911 Capstone expe (6 credits)	erience for chemistry undergraduates: HKUtopia	Academic Year	2014			
Offering Department	Chemistry	Chemistry Quota				
Course Co-ordinator	Dr A P L Tong, Chemistry (apltong@hku.hk)					
Teachers Involved	TBC, Chemistry					
Course Objectives	This project-based course with the theme of Chemistry for a Better Living in a Foreseeable Future aims to provide students with a capstone experience. It aims to enable students to think what are the key issues the world is facing with that have to be solved by chemistry and related technology. Students will need to apply what they have learnt in classroom and conduct literature search regarding advanced chemistry research and related technology under development to solve the problems identified in their project using various channels.					
Course Contents & Topics	No formal teaching. It is expected that students devote 120-140 hours to working on this project. Students will work in groups of two or three, under the supervision of the course coordinator. The duration of the project will be two to three months. The time of running this project-based course is in the summer (May - August).					
Course Learning Outcomes	On successsful completion of the course, students should be able to	):				

	be used to 2. Integrat 3. Work in 4. Express 5. Develop	e and evaluate the various issues we solve the problems. e theory and practice, and to underst a team and to collaborate with people scientific ideas effectively in both wro further logical, critical thinking and cet to others the appreciation for chem	and limitations of their current e with different background. itten and oral forms. reativity.	t knowledge	·	
Pre-requisites (and Co-requisites and Impermissible combination)	24 credits Students v	are expected to have satisfactorily con of advanced level compulsory/core con who are interested in taking the cours one course is for Chemistry Major stu	hemistry courses in the Cheme e should contact the Departm	nistry Major.		
Offer in 2014 - 2015	Y Sur				No Exam	
Offer in 2015 - 2016	Υ		·			
Course Grade	A+ to F					
Grade Descriptors	A					
	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 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	C Demonstrate general but incomplete grasp of the subject. Evidence of some analytical and critical abilities and logical thinking. Use of relevant information from sources, showing ability to make comparisons between different interpretations and to quote/reference aptly. Mostly correct but some erroneous use of data and results to draw appropriate conclusions. Show some partial integration of theories, principles, evidence and techniques. Apply moderately effective organizational and presentational skills.				
	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. Show limited integration of theories, principles, evidence and techniques. Apply limited or barely effective organizational and presentational skills.				
	Fail  Demonstrate evidence of little or no grasp of the knowledge and understanding of the subject. Evidence of little or lack of analytical and critical abilities, logical and coherent thinking. Limited use of secondary sources and no critical comparison of them. Misuse of data and results and/or unable to draw appropriate conclusions. Show little or no or inapt integration of theories, principles, evidence and techniques. Organization and presentational skills are minimally effective or ineffective.					
Course Type	Project-ba	sed course				
Course Teaching	Activities	3	Details		No. of Hours	
& Learning Activities	Meeting v	vith supervisor	Tutorials		10	
	Reading	Self study			60	
	Assessm	ent	Group work or project		70	
Assessment Methods and Weighting	Methods		Details		Weighting in final course grade (%)	
	Research	report			100	
Required/recommended reading and online materials		No specific list of textbooks and references. Students are encouraged to obtain information via various channels (main library, e-journals, internet, and discussions with classmates and teachers, etc.).				
Course Website	http://www	.chemistry.hku.hk/hkutopia/				

CHEM4966 Chemistry inte	rnship (6 credits)	Academic Year	2014		
Offering Department	Chemistry	Quota			
Course Co-ordinator	Dr W T Chan, Chemistry (wtchan@hku.hk)				
Teachers Involved	TBC, Chemistry				
Course Objectives	This course aims to offer students the opportunities to gain work experimajor of study. The workplace learning experience would be of great knowledge gained in the study to the real work environments. Studen of internship work either within the University or outside the University of	benefits to the stud	ents to apply their at least 160 hours		
Course Contents & Topics	- Within the University: The student will be supervised by a staff meml or various tasks as instructed by the Supervisor Outside the University: The student will work in an external agenc student will be supervised under a staff member of the external agenc member of the Department/School of the student (the Internal Supervis student will normally be instructed by the External Supervisor, w Supervisor.	y related to the may (the External Supersor). The work to be	ajor of study. The ervisor) and a staff e performed by the		
Course Learning Outcomes	On successful completion of this course, students should be able to:  1. Apply knowledge in their major study in solving practical problems in  2. Gain first hand work experience in the industry related to their major	nowledge in their major study in solving practical problems in the work place.			

Pre-requisites (and Co-requisites and Impermissible combination	CHEM4XX	Pass in at least 24 credits of advanced level compulsory/core chemistry courses (CHEM3XXX or CHEM4XXX) in the Chemistry Major. Students are expected to have satisfactorily completed their Year 3 study. This capstone course is for Chemistry Major students only.			
Offer in 2014 - 2015	Y 2nd	sem Summer	Examination	No Exam	
Offer in 2015 - 2016	Υ				
Course Grade	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	assigned by supervisor(s). Fails to e	ms in the workplace. Fails to handle or carry out the establish effective collaboration or communication or satisfy the requirements set out in the Course Destion by supervisor(s), etc.	with supervisor(s), other	
Course Type	Internship				
Course Teaching & Learning Activities	Activitie	s	Details	No. of Hours	
a Learning Activities	Internship	p 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	<b>.</b>	Details	Weighting in final course grade (%)	
	Written re	eport	written report, employer's feedback and oral presentation	100	
Additional Course Information	those who Satisfacto internship Distinction obtain the Enrolmen through t	Students are expected to have satisfactorily completed their Year 3 study. Special consideration be given to hose who have completed Year 2.  Satisfactory completion of this course can be counted towards the Capstone requirement. Details of internship will be recorded on the student's transcript. This course will be assessed on "Pass, Fail and Distinction" basis. Students who are interested to enrol in this course should contact the Department to obtain the approval.  Enrolment of this course is not conducted via the online course selection system and should be made through the relevant Department/School office after approval has been obtained from the course coordinator.			

CHEM4999 Chemistry proj	ject (12 cre	dits)			Academic Year	2014
Offering Department	Chemistry				Quota	
Course Co-ordinator	Dr J Y Tai	ng, Chemistry (	jinyao @hku.hk)			
Teachers Involved	various te	achers in the D	epartment, Chemisti	у		
Course Objectives				s by working on a short e students for graduate		
Course Contents & Topics	A short re	search project	provided by a memb	er of staff (e.g. the stude	ents supervisor).	
Course Learning Outcomes	1. Unders 2. Demon their own 3. Demon	derstand the terminology and nomenclature associated with their own research chemistry project.  In the terminology and nomenclature associated with their own research chemistry project.  In the terminology and understanding of the chemical techniques they used to do the research with chemical project.  In the terminology and understanding of the results of their own chemistry project and its content to the terminology and understanding of the results of their own chemistry project and its content to the terminology and understanding of the results of their own chemistry project and its content to the terminology and understanding of the results of their own chemistry project and its content to the terminology and th				
Pre-requisites (and Co-requisites and Impermissible combination)	CHEM4XX instrumen CHEM354	(X) in the (tation, and Chartelet The American Chartelet The Chartele	Chemistry Major ir HEM3341 Inorganic	level compulsory/core locluding CHEM3241 chemistry II, and CH to quantum chemistry. students only.	AnalyticaÍ chemistry EM3441 Organic ch	II: chemistr
Offer in 2014 - 2015	N				Examination	
Offer in 2015 - 2016	Y					
Course Grade	A+ to F					
Course Grade Grade Descriptors	A+ to F	presence of so wide range of h conclusions. Do very effective of	me originality. Illuminating igh quality sources. Critic emonstrate integration of	e research project. Demonstra g utilization and critical analys al employment of data and res a wide range of appropriate thational skills. [Work of A+ sh evant to the topic.]	sis / evaluation of informati sults to synthesize appropri neories, principles, data an	on acquired from ate and illumination d methods. Emplo
		presence of so wide range of h conclusions. Do very effective obeyond that is r  Show a substand of relevant info secondary intel	me originality. Illuminating in the properties of the properties o	g utilization and critical analys al employment of data and res a wide range of appropriate the tational skills. [Work of A+ sh	sis / evaluation of informati sults to synthesize appropri neories, principles, data an nould demonstrate substan atte able analytical and critic me meaningful comparisons m appropriate conclusions	on acquired from ate and illuminating the methods. Emploitial additional wo at thinking with use between difference. Compose gener

	D	Show a partial but limited comprehension, w Presence of some coherent and logical thinki reference of several sources, but mostly via employ data and results to form appropriate c and methods. Perform limited or marginally	ities. Show utilization and parison. Limited ability to f theories, principles, data		
	Fail	Show little or no comprehension of the research project. Evidence of little or lack of analytical and critical abilities, logical and coherent thinking. Limited employment of secondary sources and no critical comparison of them. Incorrectly utilize data and results and/or unable to form appropriate conclusions. Demonstrate little or no integration of theories, principles, data and methods. Organization and presentational skills are of very limited use or ineffective.			
Course Type	Project-bas	sed course			
Course Teaching	Activities		Details	No. of Hours	
& Learning Activities	Reading / Self study		8 hours per week for 24 weeks or longer discussions & meetings	192	
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	
	Dissertation		including a written report and an oral presentation	100	
Required/recommended reading and online materials	Specialist texts dependant on the selected topic.				
Additional Course Information	Third year	students with exceptional academic ac	chievement may also apply for this co	ourse	

ENVS3042 Pollution (6 cr	edits)		Academic Year	2014		
Offering Department	Chemistr	у	Quota	60		
Course Co-ordinator	Dr W T C	Dr W T Chan, Chemistry (wtchan@hku.hk)				
Teachers Involved		u, Biological Sciences Chan or Prof D L Phillips (in alternate year), Chemistry				
Course Objectives	the impace	uce students to the principles of chemical and biologic cts of pollution on environmental health. The course pri tental toxicology, environmental monitoring and tes ity, waste treatment and technologies, and environmer	ovides the basics for advating, environmental impa	anced courses or		
Course Contents & Topics	and bioc status; p pollutants pollution	of pollution and associated characteristics; strategy of pollution reduction and treatment; chemical processes involved in pollution development; indicators and (bio)markers of pollution pollution monitoring techniques and application; interactions between biological systems and its in aquatic and terrestrial environments; chemical toxicity, exposures and risk assessment; n of air, water and soil; global climate change, and stratospheric-ozone depletion; water pollution astewater treatment; harmful algal blooms; solid and hazardous waste; soil pollution and ation.				
Course Learning Outcomes	1. Explair 2. Explair 3. Explair 4. Explair	On successful completion of this course, students should be able to:  1. Explain types of pollution and their impact to the environment and population.  2. Explain mechanisms of pollution development.  3. Explain indicators and biomarkers of pollution and monitoring techniques of pollution.  4. Explain strategy of pollution reduction, treatment and remediation.  5. Explain chemical toxicity and risk assessment.				
Pre-requisites (and Co-requisites and Impermissible combination)	ENVS130	Pass in ENVS1401 Introduction to environmental science or BIOL1110 From molecules to cells of ENVS1301 Environmental life science; and CHEM2041 Principles of chemistry or ENVS2002 Environmental field and lab course or ENVS2002 Environmental data analysis				
Offer in 2014 - 2015	Y 2n	d sem	Examination	May		
Offer in 2015 - 2016	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 chemical instrumentations and applications. Show strong ability to apply and integrate knowledge and theory, and strong ability to analyze problems related to fundamental principles and practical aspects of instrument design.				
	В	B Demonstrate substantial command of knowledge and understanding of essential facts, concepts, principles and theories relating to the modern chemical instrumentations and applications. Show evidence to apply and integrate knowledge and theory, and ability to analyze problems related to fundamental principles and practical aspects of instrument design.				
	С	C Demonstrate general but incomplete command of knowledge and understanding of essential facts, concepts, principles and theories relating to the modern chemical instrumentations and applications. Show evidence of some abilities to apply and integrate knowledge and theory, and to analyze problems to most familiar situations to fundamental principles and practical aspects of instrument design.				
	Demonstrate partial but limited command of knowledge and understanding of essential facts, concepts, principles and theories relating to the modern chemical instrumentations and applications. Show evidence of limited abilities to apply and integrate knowledge and theory, and limited ability to analyze problems to most familiar situations related to fundamental principles and practical aspects of instrument design.					
	Fail	Fail  Demonstrate little or no evidence of command of knowledge and understanding of essential facts, concepts, principles and theories relating to the modern chemical instrumentations and applications. 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 fundamental principles and practical aspects of instrument design.				
Course Type	Lecture v	vith laboratory component course				

& Learning Activities	Activities	Details	No. of Hours
	Lectures		24
	Laboratory		36
	Reading / Self study		100
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)
	Assignments	student-based assessment - lab report, review report, group project and presentation	40
	Examination		60
Required/recommended reading and online materials	Marquita K. Hill: Understanding Environm	ental Pollution (Cambridge University Press	s, 2nd edition)
Additional Course Information	Laboratory classes are mandatory. Studies this course.	lents must complete ALL experiments and	laboratory reports to

<b>CSCI9001 Practical Chines</b>	se for scien	ce students (6 credits)		Academic Year	2014	
Offering Department	Chinese			Quota		
Course Co-ordinator	Mr K W Wo	ong, Chinese <i>(kwwongb@hkusua.hku.</i> .	hk)			
Teachers Involved	Dr K T Lam Dr S F Lee					
Course Objectives	helps the semails, letter resentation	This course aims to enhance the students' competence using Chinese for professional communication. helps the students to master the techniques of writing different types of documents such as memos emails, letters, announcements, notice, brochures, leaflets, and reports. In addition, topics addressing resentation and discussion techniques, the style and rhetoric of reader-based writings are included to heighten the students' linguistic sensitivity.				memos, ddressing
Course Contents & Topics	messages: Techniques	- Grammar & vocabulary of modern Chinese - The Chinese writing system - Techniques of writing shot messages: good-news and goodwill messages, bad-news messages, and persuasive messages. Techniques of writing electronic documents: emails; presentations - Styles and rhetoric of reader-based reports, proposals and presentations				ssages -
Course Learning Outcomes	modern Ch practical w discussions Chinese w	sful completion of the course, students innese and write well-formed sentence riting skills specific to their disciplication and debates and address new chariting skills and professional presentation of professional discourses.	es; - Employ rhetoric ne; - Explore new allenges; - Apply the	al devices and sty tactics of commu ir disciplinary kno	listics, a unication wledge	s well as , initiate and their
Pre-requisites (and Co-requisites and Impermissible combination)	NIL					
Offer in 2014 - 2015	Y 1st s	em 2nd sem		Examination	Dec	May
Offer in 2015 - 2016	Υ					
Course Grade	A+ to F					
Grade Descriptors	A The student acquired a superb ability to achieve the intended learning outcomes of the course at all levels of learning: describe, apply, evaluate, and synthesize the language techniques for effective communication in all situations.  B The student acquired the ability to achieve the intended learning outcomes of the course at all levels of learning: describe, apply, evaluate, and synthesize the language techniques for effective communication in most situations.  C The student acquired adequate ability to achieve the intended learning outcomes of the course at low levels of					
	learning (i.e. describe and apply the language techniques for effective communication) but not at high levels of learning (i.e. evaluate and synthesize the language techniques for effective communication).					
	D Fail	The student only has basic familiarity with the  The student has very limited familiarity with the				
Course Type	Lecture-ba	sed course				
Course Teaching			D-1-11-		NI.	-411
& Learning Activities	Activities Lectures		Details		NO.	of Hours
	Tutorials					12
	1	-l-				24
	Group work  Reading / Self study		Online learning homework (12% assessment (i preparation) (12%)	(24%), %) and ncluding		72
Assessment Methods and Weighting	Methods		Details			g in final grade (%)
	Examination	on				50
	Assignments		Written project and quiz (40%) and disscussion (10%)			50
Required/recommended reading and online materials	用》。香港 大學出版社 傳意大全》 語文學部, 《企業文案	198年。《漢語修辭》。上海:上海大學 :香港大學出版社。香港城市大學語文 。周錫韋复,1996年。《中文應用寫作 。香港:商務印書館。汪麗炎,1998年 2001年。《中文傳意:寫作篇》。香港 撰寫模式大全》。廣州:廣東經濟出版 。黎運漢、李軍,2001年。《商業語言	:學部,2001年。《中 F教程》。香港:三聯 F。《漢語寫作》。上 巷:香港城市大學出版 ī社。劉美森,2001年	文傳意:基礎篇》 書店。李錦昌,20 海:上海大學出版 社。經文略、蘭德 .。《新編公文寫作	。香港: 00年。 社。香港 主編,20	香港城市 《現代商業 號城市大學 001年。

EASC1020 Introduction to				Academic Year	2014	
Offering Department	Earth Scie	nces		Quota		
Course Co-ordinator	Dr Z H Liu	Dr Z H Liu, Earth Sciences (zhliu@hku.hk)				
Teachers Involved		, Earth Sciences Earth Sciences				
Course Objectives	the contro	te provides an introduction to the study is of temporal and spatial variations in e plogical record. We look at modern onmental reconstructions.	earth's climate and its	histories of past	climates preserved	
Course Contents & Topics	through generated events of	natic systems, climate classification, neeologic time, external and internal forc the past and their effects on how our p future global change.	cing mechanisms, so	lar orbital variatio	ns, major climation	
Course Learning Outcomes	On succes	ssful completion of this course, students	should be able to:			
	<ol> <li>Explain</li> <li>Underst</li> </ol>	major aspects of climatology and approtect the factors and physical processes con and the driving forces of Earth's climate ize the history of Earth's climate change	trolling climate syster change.			
Pre-requisites (and Co-requisites and Impermissible combination)	NIL					
Offer in 2014 - 2015	Y 2nd	sem		Examination	May	
Offer in 2015 - 2016	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 critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Demonstrate critical use of data and results to draw appropriate and insightful conclusions. Show insightful use and critical analysis / evaluation of information drawn from a full range of high quality sources and to quote/reference aptty.				
	В	Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Demonstrate correct use of data and results to draw appropriate conclusions. Show critical use of relevant information from sources and ability to make meaningful comparisons between different secondary interpretations and to quote/reference aptly.				
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Demonstrate mostly correct but some erroneous use of data and results to draw appropriate conclusions. Show use of relevant information from sources and ability to make comparisons between different interpretations and to quote/reference aptly.				
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Demonstrate limited ability to use data and results to draw appropriate conclusions. Show use and reference of several sources, but mainly through summary rather than analysis and comparison.				
	Fail	Demonstrate little or no 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. Demonstrate misuse of data and results and/or unable to draw appropriate conclusions. Show limited use of secondary sources and no critical comparison of them.				
Course Type	Lecture-ba	ased course				
Course Teaching	Activities	S	Details		No. of Hours	
& Learning Activities	Lectures				36	
	Tutorials				12	
	Project w	ork			24	
		Reading / Self study			50	
Assessment Methods	Methods		Details		Weighting in fina	
and Weighting					course grade (%)	
	Assignme	Assignments			25	
	Examinat	ion			50	
	Project re	ports			25	
Required/recommended reading and online materials		, W. F.: Earth's Climate Past and Future Rohli and Anthony J. Vega: Climatology				

EASC1401 Blue planet (6 credits)			Academic Year	2014	
Offering Department	Earth Sciences	Earth Sciences			
Course Co-ordinator	Dr P Bach, Earth Sciences (pabach@hku.hk)	Dr P Bach, Earth Sciences (pabach@hku.hk)			
Teachers Involved	Dr P Bach, Earth Sciences Dr P Y Tam (Tammy), Earth Sciences				

Course Objectives	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. In addition, students should become familiar with the way the study of Earth Sciences blends observation, information, hypothesis, communication and decision making for a better understanding of the future of our planet.				
Course Contents & Topics	<ul><li>Introduc</li><li>Lithosph</li><li>Cycle)</li><li>Hydrosp</li><li>Atmosph</li><li>Biosphe</li><li>Concep</li></ul>	The course will introduce and discuss the following topics: - Introduction to Earth Systems and Habitable Planet Earth, - Lithosphere (Earth Materials, Plate Tectonics, Volcanism, Earthquakes, Surface Processes and Rock			
Course Learning Outcomes	On succe	ssful completion of this coul	rse, students should be able to	<b>D</b> :	
	2. Demon Earth Sys 3. Unders 4. Demon environme	strate knowledge and unde tems and their dynamic inte tand the extent and nature istrate the ability to make a ents.	omenclature appropriate to the erstanding of the underlying contractive processes. of global change and environry and record observations on Environment and knowledge in a reportation and knowledge in a reportation.	oncepts associated w nental concerns arou arth Systems proces	vith the study of the and us.
Pre-requisites (and Co-requisites and Impermissible combination)	NIL				
Offer in 2014 - 2015	Y 1st	sem 2nd sem		Examination	Dec May
Offer in 2015 - 2016	Υ				
Course Grade	A+ to F				
Grade Descriptors	A	A Demonstrate thorough mastery of extensive knowledge / competencies/skills at an Earth Science introductory level required for attaining most or all of the course learning outcomes. Shows clear understanding of introductory terminology and concepts and strong abilities to apply and relate them in a range of complex interactive processes between Earth Systems. Demonstrates highly effective observational skills in field as well as organizational skills to present important observations made and uses them to draw appropriate and insightful conclusions with an impressive level of depth and original thoughts.			
	В	B Demonstrate substantial command of knowledge / competencies/skills at an Earth Science introductory level required for attaining most of the course learning outcomes. Shows evidence for understanding of introductory terminology and concepts and some abilities to apply and relate them in a range of complex interactive processes between Earth Systems. Demonstrates effective observational skills in field as well as organizational skills to present important observations made and uses them to draw appropriate and insightful conclusions with some level of depth.			
	С	Demonstrate general but incomplete command of knowledge / competencies/skills at an Earth Science introductory level required for attaining most of the course learning outcomes. Shows evidence for some understanding of introductory terminology and concepts and some abilities to apply and relate them in some interactive processes between Earth Systems. Demonstrates moderately effective observational skills in field as well as organizational skills to present observations made mostly correct but with some erroneous use and results to draw appropriate conclusions.			
	D	Demonstrate partial but limited command of knowledge / competencies/skills at an Earth Science introductory level required for attaining some of the course learning outcomes. Shows evidence of limited understanding of introductory terminology and concepts and limited abilities to apply and relate them in some interactive processes between Earth Systems. Demonstrates limited observational skills in field. Applies limited or barely effective organizational and presentational skills to present observed details and facts correctly. Limited ability to draw appropriate conclusions.			
	Fail	level required for attaining to introductory terminology and between Earth Systems. Demo	nce of command of knowledge / com- he course learning outcomes. Sho concepts and little or no abilities to onstrates poor observational skills in we presentation of observed detail	ws little or no evidence apply and relate them in field. Applies incoherent of	of understanding of interactive processes organizational and poor
Course Type	Lecture w	ith laboratory component co	ourse		
Course Teaching	Activitie	s	Details		No. of Hours
& Learning Activities	Lectures				24
	Laborato	ry			24
	Field wor	•	2-day field camp	)	16
	Reading / Self study				100
Assessment Methods and Weighting	Methods	<b>3</b>	Details		Weighting in final course grade (%)
	Examina	tion			40
	Laborato	ry reports			20
	Project re	eport	Field project rep	ort	30
	Test		Quizzes		10
Required/recommended reading and online materials		.J and Porter S.C.: The Blue and Damian N.: Earth Scie	` ,	<u> </u>	

EASC1402 Principles of g Offering Department	Earth Scien	·	Quota		
<u> </u>			Quota		
Course Co-ordinator		un, Earth Sciences (minsun@hku.hk)			
Teachers Involved		Prof M Sun, Earth Sciences Dr Jess King, Earth Sciences			
Course Objectives	This course	e is an introduction to fundamental princip	les and concepts in geology.		
Course Contents & Topics	- Rocks an - Plate tect - Earthqua - Igneous p - Geomorp - Sediment - Folds, Fa - Metamorp - Principles - Biostratig	ults and Metamorphism			
Course Learning Outcomes	1. Recite th 2. Describe 3. Explain 4. Describe	e rock cycle and the rock material in the the overall structure of the earth and the he major geological phenomena in the country that the methods in geological dating.	earth's crust. key external and internal process	ses.	
Pre-requisites (and Co-requisites and Impermissible combination)	NIL				
Offer in 2014 - 2015	Y 1st s	em	Examination	Dec	
Offer in 2015 - 2016	Υ				
Course Grade	A+ to F				
Grade Descriptors	B C	Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.  Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.  Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course			
	D	learning outcomes. Show evidence of some ana knowledge to most familiar situations. Apply mode Demonstrate partial but limited command of know outcomes. Show evidence of some coherent ar Show limited ability to apply knowledge to solv presentational skills.	erately effective organizational and presen wledge and skills required for attaining so nd logical thinking, but with limited analy	ntational skills.  me of the course learning tical and critical abilities.	
	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	n laboratory component course			
Course Teaching	Activities	D	etails	No. of Hours	
& Learning Activities	Lectures	1:	2 sessions x 2 hours	24	
	Laborator	, m	aboratory practical on rocks and ninerals, earthquakes, fossil dentification	16	
	Field work	1	field trip	8	
	Group wo	k 1	group project with presentation	4	
	Reading /	Self study		100	
Assessment Methods and Weighting	Methods	D	Petails	Weighting in final course grade (%)	
	Examinati	on 2	-hour written exam	50	
	Laborator	reports	ractical reports	25	
	Presentati	on		10	
	Project re	port		15	
Required/recommended reading and online materials	TBC				

EASC1403 Geological he	Academic Year	2014	

Offering Department	Earth Scie	nces		Quota	35
Course Co-ordinator	Dr P Y Tar	n, Earth Sciences (ttpy2002@hku.hk)			
Teachers Involved		n, Earth Sciences hou, Earth Sciences			
Course Objectives		overview of the geology of Hong Kong, the development of Hong Kong's infrastru		resources for touris	sm and the role of
Course Contents & Topics	geological	on general geology of Hong Kong, ge knowledge pertaining to large scale cons- nours) guided by experts to localities of ge	truction project plus		
Course Learning Outcomes	1. Acquire 2. Demons 3. Enhance	sful completion of this course, students shan appreciation of the processes leading to trate understanding of the major morphologe the observation and analytical skills, and anding the different impacts on / important	o the formation of va ogical features in Ho physical ability thro	ng Kong. ugh participation in i	the field excursion.
Pre-requisites (and Co-requisites and Impermissible combination)	NIL				
Offer in 2014 - 2015	Y 2nd	sem		Examination	May
Offer in 2015 - 2016	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.				
	C Demonstrate general but incomplete understanding required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking. Moderately effective organization and presentation skills.				
	Demonstrate partial but limited understanding for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to solve problems. Apply limited or barely effective organizational and presentational skills.				
	Fail  No or little knowledge about the subject. No evidence for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Very little or no ability for field observation and for solving problems. Poor organization and presentational skills.				
Course Type	Lecture-ba	sed course			
Course Teaching	Activities		Details		No. of Hours
& Learning Activities	Lectures		8 sessions x 2 hou	ırs	16
	Field work		3 field trips		21
	Group wo	rk	1 presentation and	d report	27
	Reading /	Self study			60
	Assessment		3 field reports		20
Assessment Methods and Weighting	Methods		Details		Weighting in final course grade (%)
	Assignme	nts	attendance of 3 guided field trips	B compulsory	10
	Essay		3 field reports		30
	Examinati	on	2-hour written exa	mination	30
	Presentat	on	1 group presentat	ion	15
	Project re	port	1 group project		15

Course Co-ordinator  Teachers Involved  Course Objectives  This course for thought to har This course v Solar system.  Course Contents & Topics  This course v first oceans; elsewhere in	EASC1404 Early life on earth (6 credits)				
Teachers Involved  Course Objectives  This course for thought to har This course v Solar system.  Course Contents & Topics  This course v first oceans; elsewhere in	Earth Sciences Quota				
Course Objectives  This course for thought to har This course very Solar system.  Course Contents & Topics  This course very first oceans; elsewhere in	Dr K H Lemke, Earth Sciences (kono@hku.hk)				
thought to har This course v Solar system.  Course Contents & Topics  This course v first oceans; elsewhere in	Earth Sciences				
first oceans; elsewhere in	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.				
chemical roots	This course will cover the following topics: the composition and properties of the early Earth and Earth's first oceans; the central role of water in life; abundance of biological elements on the early Earth and elsewhere in the Solar system; possible conditions for the synthesis of life's first building blocks; the (geo) chemical roots of early life on Earth and the search for life's signatures in the solar system and beyond.				
Course Learning Outcomes On successfu	On successful completion of this course, students should be able to:				

	<ol> <li>Explain molecules</li> <li>Unders</li> <li>Identify</li> </ol>	<ol> <li>Describe the basic physical and chemical conditions on the early Earth.</li> <li>Explain and describe the role of water and extreme geochemical conditions in the synthesis of molecules.</li> <li>Understand the role that different geological environments played during the origins of life.</li> <li>Identify challenges associated with each step in the origins of life.</li> <li>Investigate a current origins of life topic.</li> </ol>					
Pre-requisites (and Co-requisites and Impermissible combination)	NIL	NIL					
Offer in 2014 - 2015	N	Examination					
Offer in 2015 - 2016	N						
Course Grade	A+ to F						
Grade Descriptors	A	attaining all course learning outcomes. She vidence of original thought, and the ability around "origins of life" topics, and at the	it an advanced level of extensive knowledge nows strong analytical and critical abilities to apply his/her knowledge to a wide rang same, can combine knowledge from the r Earth and elsewhere. Student shows the abi	and logical thinking, with e of problems that center natural sciences to better			
	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.					
	С	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 the field of the "origins of life". Student shows the ability to apply moderately effective organizational and presentational skills.					
	D	Student demonstrates partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability understand key topics in the "origins of life" field. Student shows the ability to apply limited or barely effective organizational and presentational skills.					
	Fail	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 origins of life. Organization and presentational skills are minimally effective or ineffective.					
Course Type	Lecture w	ith laboratory component course					
Course Teaching	Activitie	s	Details	No. of Hours			
& Learning Activities	Lectures			24			
	Laborato	ry		24			
	Reading	/ Self study		100			
Assessment Methods and Weighting	Methods	•	Details	Weighting in final course grade (%)			
	Assignme	ents	1 midterm, group presentations, short-essay	60			
	Examina	tion	2-hour written examination	40			
Required/recommended reading and online materials	K.W. Plax	rom: Mason, S.F.: Chemical Evolution co & M. Gross: Astrobiology: A brief In & M.A. Sephton: An Introduction to As	troduction (J. Hopkins University Pre				

Quota  and knowledge on application of noplications of nuclear sciences by c							
oplications of nuclear sciences by c							
oplications of nuclear sciences by c							
oplications of nuclear sciences by c							
s; radiation on earth and beyond; in	Man and radiation; principles of nuclear technology; case studies of nuclear techniques applied in arts, engineering, biological, physical and social sciences; radiation on earth and beyond; industrial application of nuclear techniques; nuclear techniques in medical study. Future development in nuclear technologies.						
nould be able to: echnologies. hnologies applied. clear sciences. I of the underlying concepts asso	ciated with nuclear						
Examination	Dec						
·							
s l	s; radiation on earth and beyond; in study. Future development in nucl hould be able to: chnologies. nnologies applied. clear sciences. of the underlying concepts associ						

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 the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills					
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.				
	D					
	Fail	outcomes. Lack of analytical and critical a	nmand of knowledge and skills required for a abilities, logical and coherent thinking. Show v n and presentational skills are minimally effect	ery little or no ability to apply		
Course Type	Lecture-	based course				
Course Teaching	Activities		Details	No. of Hours		
& Learning Activities	Lectures			36		
	Tutorials			12		
	Field work			6		
	Group work			6		
	Project work			6		
	Reading / Self study			92		
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)		
	Assignments		Group activities and reports	30		
	Examination		2-hour	50		
	Project	reports	Individual Report	20		
Required/recommended reading and online materials	To be ar	nnounced				

EASC2401 Fluid/solid inte	eractions in	earth processes (6 credits)	Ac	cademic Year	2014		
Offering Department	Earth Sci	nces	Qı	uota			
Course Co-ordinator	Dr K Lem	te, Earth Sciences (kono@hku.hk)					
Teachers Involved		Dr K Lemke, Earth Sciences Dr M H Lee, Earth Sciences					
Course Objectives	This cour	This course provides an overview of the physical and chemical principles that govern Earth processes					
Course Contents & Topics	- Earth in - Introduc - States c - Mineral - Energy - Kinetics - Newtoni - Fluid flo	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, crystallisation and melting (2) - Mineral-solution interfaces (1) - Energy exchange in Earth environments: convection, conduction and radiation (2) - Kinetics, reaction rates and isotope fractionation on geological time scales(1) - Newtonian mechanics and basic laws of motion (1) - Fluid flow and particle transport (1) - Gravitational, geostrophic and centripetal forces (1)					
Course Learning Outcomes	On successful completion of this course, students should be able to:  1. Understand basic principles of thermodynamics as applied to the Earth Sciences. 2. Use phase diagrams to explain processes of fluid/solid interactions. 3. Describe how energy is exchanged throughout the Earth System. 4. Demonstrate an understanding of the kinetics of geochemical reactions. 5. Comprehend the principles of motion and the basic forces affecting movement of gases, liquids on Earth.						
Pre-requisites (and Co-requisites and mpermissible combination)	Pass in E	ASC1401 Blue planet or EASC1402 Prin	nciples of geology				
Offer in 2014 - 2015	Y 2nd	sem	Ex	kamination	May		
Offer in 2015 - 2016	Υ						
Course Grade	A+ to F						
Grade Descriptors  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.					h evidence of origin		

	В	the course learning outcomes. Show ev	broad range of knowledge and skills requidence of analytical and critical abilities a familiar situations. Apply effective organizations.	and logical thinking, and ability to		
	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 learni 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 v	vith laboratory component course				
Course Teaching & Learning Activities	Activities		Details	No. of Hours		
& Learning Activities	Lectures		12 sessions x 2 hour	24		
	Laboratory		paper exercises	24		
	Reading / Self study			100		
Assessment Methods and Weighting	Method	s	Details	Weighting in final course grade (%)		
	Assignments			60		
	Examination			40		
Required/recommended reading and online materials	TBA					

EASC2402 Field methods	(6 credits)		Academic Year	2014				
Offering Department	Earth Scien	nces	Quota					
Course Co-ordinator	Dr P Bach,	Earth Sciences (pabach@hku.hk)						
Teachers Involved	Dr P Bach,	Dr P Bach, Earth Sciences						
Course Objectives		This course is hands-on field and class-based that introduces basic geological field and mappir techniques and the use of geological equipment and air photographs, an overview of the geology of Ho Kong.						
Course Contents & Topics	<ul> <li>Interpreta outcrop pa unconform</li> <li>Interpreta</li> </ul>	<ul> <li>Maps and map reading, map reference system (1 week)</li> <li>Interpretation of geological maps: topographic and geological cross sections, geological structures from outcrop patterns and structural contour lines (horizontal, inclined strata, folded, and faulted strata unconformities) (3 weeks)</li> <li>Interpretation and use of air photographs (1 week)</li> <li>Geological field techniques and equipment, field observation and description of rocks and outcrops (field days)</li> </ul>						
Course Learning Outcomes	1. Read ge 2. Construct 3. Demons 4. Create and data. 5. Develop	On successful completion of this course, students should be able to:  1. Read geological maps and comprehend 3-D geological structures from 2-D geological maps. 2. Construct a geological cross section showing interpreted subsurface rocks and structures. 3. Demonstrate techniques for basic field observations, measurements and identifications. 4. Create and interpret an internally consistent geological map from a set of collected field observation and data. 5. Develop skills in integrating geological field data in determining a geological history and writing a structured field report.						
Pre-requisites (and Co-requisites and mpermissible combination)	Pass in EA	SC1401 Blue planet or EASC1402 Principles of geolog	gy					
Offer in 2014 - 2015	Y 1st s	sem	Examination	Dec				
Offer in 2015 - 2016	Υ							
Course Grade	A+ to F							
Grade Descriptors	A Demonstrate thorough and complete grasp of the subject in order to fulfill most or all learning outcomes. Show strong ability to record observations on earth processes in the field and to apply knowledge to familiar and unfamilia situations. Evidence of strong independent analytical, critical and logical thinking. Show strong ability to synthesiz all observations made and knowledge in a field report and geological map with highly effective organizational an presentational skills.							
		processing comment						
	В	Demonstrate substantial grasp of the subject required for most of record observations on earth processes in the field and to a situations. Evidence of independent analytical, critical and lobservations made and knowledge in a field report and gentlements of the presentational skills.	pply knowledge to familiar a ogical thinking. Shows abili	and some unfamilia ty to synthesize a				
	С	Demonstrate substantial grasp of the subject required for most of record observations on earth processes in the field and to a situations. Evidence of independent analytical, critical and lobservations made and knowledge in a field report and ge	pply knowledge to familiar a ogical thinking. Shows ability eological map with effective ed for most of the learning of id and apply knowledge to miking. Show ability to synthesis	and some unfamilia ty to synthesize all organizational and outcome. Evidence of ost familiar situations ze most observation				

		Evidence of some coherent and logical think synthesize some observations made and organizational and presentational skills.		
	Fail	Demonstrate little or no grasp of the subject to record observations on earth processes is problems. Evidence of little or lack of analytin ability to synthesize observations made organizational and poor presentational skills	cal and critical abilities, coherent and logical and knowledge in a field report and geole	to apply knowledge to solve thinking. Shows very little or
Course Type	Field car	nps		
Course Teaching	Activities		Details	No. of Hours
& Learning Activities	Lectures		12 sessions x 1 hour	12
	Field work		5-day field camp & 2 day trips	56
	Laboratory work		12 hours paper exercises	12
	Reading / Self study			100
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)
	Assignments		Lab Assignments	10
	Report		Field Work Assessment	70
	Test			20
Required/recommended reading and online materials		nensive Course Notes provided. rnes: Basic Geological Mapping (Wiley,	1995, 3rd edition)	

	atmosphe	re and hydrosphere (6 credits)	Academic Year	2014			
Offering Department	Earth Scie	nces	Quota	50			
Course Co-ordinator	Dr J R Ali,	Earth Sciences (jrali@hku.hk)					
Teachers Involved	,	Earth Sciences , Earth Sciences					
Course Objectives		e introduces the atmosphere and hydrosphere syste th one another.	ms, and explains at a bas	sic level how the			
Course Contents & Topics	Introduction and course plan, Earth within a broader context (Solar System and other key features) Geological forces shaping the floor of the Oceans and Seas; Water Structure, Ocean Structure and Seawater Composition/Chemistry; Introduction to the Atmosphere; Heating Earth's surface and Atmosphere; Temperature; Moisture and Atmospheric Stability; Forms of condensation and precipitation Hydrological Cycle - an overview; Air Pressure and Winds; Intro to Atmospheric Circulation and Weather Systems; Ocean Circulation; Waves; Tides; Coasts; Groundwater basics; Groundwater usage, contamination, caves and karst; Glaciers and glacial landscapes; Climate system, proxy data, causes o climate change; Effects of climate change.						
Course Learning Outcomes	On successful completion of this course, students should be able to:  1. Understand the important features which distinguish Earth from the other planets within our Sola System, particularly with regards to its outer fluid envelopes.  2. Appreciate that on a geological timescale, the ocean basins and the seas are continually changing the location and morphology, and why this is the case.  3. Understand the key features of water, and the critical role the compound plays in the Atmospher Hydrosphere system.  4. Understand the basic physical phenomena associated with the Atmosphere and the Oceans/Seas and their important lower-order elements.						
	Hydrosphe 4. Underst their impor	ere system. ´ tand the basic physical phenomena associated with t	he Atmosphere and the	·			
and Co-requisites and	4. Undersi their impor 5. Have ar	ere system.  tand the basic physical phenomena associated with to the transition of	the Atmosphere and the 0 Hydrosphere topics.	·			
and Co-requisites and mpermissible combination)	Hydrosphe 4. Undersi their impor 5. Have ar Pass in EA	ere system.  tand the basic physical phenomena associated with the trant lower-order elements.  n awareness of the scientifically "hot" Atmosphere and	the Atmosphere and the 0 Hydrosphere topics.	·			
and Co-requisites and mpermissible combination) Offer in 2014 - 2015	Hydrosphe 4. Undersi their impor 5. Have ar Pass in EA	ere system.  tand the basic physical phenomena associated with the trant lower-order elements.  a awareness of the scientifically "hot" Atmosphere and ASC1401 Blue planet or EASC1402 Principles of geol	the Atmosphere and the of Hydrosphere topics.	Oceans/Seas an			
and Co-requisites and mpermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016	Hydrosphe 4. Underst their impor 5. Have ar Pass in EA	ere system.  tand the basic physical phenomena associated with the trant lower-order elements.  a awareness of the scientifically "hot" Atmosphere and ASC1401 Blue planet or EASC1402 Principles of geol	the Atmosphere and the of Hydrosphere topics.	Oceans/Seas an			
Pre-requisites (and Co-requisites and Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade Grade Descriptors	Hydrosphe 4. Underst their impo 5. Have ar  Pass in EA	ere system.  tand the basic physical phenomena associated with the trant lower-order elements.  a awareness of the scientifically "hot" Atmosphere and ASC1401 Blue planet or EASC1402 Principles of geol	the Atmosphere and the of Hydrosphere topics.  Description    Examination  Description    Examination    Description    Descri	Dec			
(and Co-requisites and impermissible combination)  Offer in 2014 - 2015  Offer in 2015 - 2016  Course Grade	Hydrosphe 4. Underst their impor 5. Have ar Pass in EA  Y 1st Y A+ to F	Thorough grasp of the subject; evidence of strong critical abilitie and presentational skills; insightful use and critical analysis / evaquality sources and to quote/reference aptly; integration of the	the Atmosphere and the of Hydrosphere topics.  Ogy  Examination  Es and logical thinking; highly efaluation of information drawn froull range of appropriate theories and logical thinking; effective m sources, showing ability to	Dec  fective organizational m a full range of high, principles, evidence organizational and make meaningful			
(and Co-requisites and Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade	Hydrosphe 4. Underst their impor 5. Have ar Pass in EA  Y 1st Y A+ to F	Thorough grasp of the subject; evidence of strong critical abilities and presentational skills; critical use of relevant information for comparisons between different secondary interpretations and some series and to quote/ferent secondary interpretations and skills; critical use of relevant information frocomparisons between different secondary interpretations and	Examination  Exami	Dec  fective organizational m a full range of high, principles, evidence organizational and make meaningful eneral integration of thinking; moderately owing ability to make			

	logical / coh	rasp of the knowledge and understanding of the subject; little or no evide rent thinking; incoherent organization and poor presentational skills; limited comparison of them; little or no or inapt integration of theories, principles, e	d use of secondary sources			
Course Type	Lecture with laboratory component course					
Course Teaching & Learning Activities	Activities	Details	No. of Hours			
	Lectures		24			
	Laboratory	including tutorials & discussion	24			
	Project work		10			
	Reading / Self study		90			
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)			
	Assignments		20			
	Essay		25			
	Examination		50			
	Presentation		5			
Required/recommended reading		nography: An Invitation to Marine Science and Edward J. Tarbuck: The Atmosphere: An Introduction to M	leteorology			

EASC2406 Geochemistry	(6 credits)	5)			Academic Year	2014		
Offering Department	Earth Sci	ciences			Quota			
Course Co-ordinator	Dr S H Li	Li, Eartl	Sciences (shli@hku.hk)					
Teachers Involved	Dr S H Li	Li, Eartl	Sciences					
Course Objectives	introduce	This course provides an understanding of the fundamentals and approaches for geochemical analysis. It introduces students to the basic chemical principles, modern techniques and quantitative analysis for studying the earth.						
Course Contents & Topics	- Differen - Aqueou - Trace el - Chemis: - Chemic - Radioac - Stable is - Oxidatic - Atmospl	<ul> <li>Physical and chemical state of the earth,</li> <li>Differentiation of and cosmic abundance of elements,</li> <li>Aqueous solutions and chemistry of natural water,</li> <li>Trace element,</li> <li>Chemistry of igneous rocks,</li> <li>Chemical controls on soil formation,</li> <li>Radioactive isotope geochemistry,</li> <li>Stable isotope geochemistry,</li> <li>Oxidation and reduction,</li> <li>Atmospheric chemistry,</li> <li>Chemical weathering</li> </ul>						
Course Learning Outcomes	<ol> <li>Demor studies.</li> <li>Descril</li> <li>Apply t</li> </ol>	On the successful completion of this course, students should be able to:  1. Demonstrate an understanding of basic principles of geochemistry and their applications to geological studies. 2. Describe element distribution in major rocks. 3. Apply the principles of isotopes to dating and studies of petrogenesis and climate changes. 4. Demonstrate knowledge of the chemical weathering processes.						
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in E	EASC1	402 Principles of geology					
Offer in 2014 - 2015	Y 1st	st sem			Examination	Dec		
Offer in 2015 - 2016	Υ							
Course Grade	A+ to F							
Grade Descriptors	A  Demonstrate extensive knowledge and skills at an advanced level required for attaining all the outcomes. Show strong analytical and critical abilities and logical thinking, and ability to apply his skills and techniques to solve problems. Critical use of data and results to draw appropria conclusions. Apply highly effective organizational and presentational skills.							
	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply effective lab skills and techniques to solve problems. Correct use of data of results to draw appropriate conclusions. Apply effective organizational and presentational skills.							
	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							
		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 course				
Course Teaching & Learning Activities	Activities	Details	No. of Hours		
& Learning Activities	Lectures	12 sessions x 2 hours	24		
	Laboratory	paper exercises	24		
	Tutorials		6		
	Reading / Self study		100		
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)		
	Assignments		40		
	Examination		60		
Required/recommended reading and online materials	Fure G.: Principle and applications of Geochemistry (Prentice Hall, 1998, 2nd ed.) Krauskopf K.B. and Bird D.K. Introduction to Geochemistry (McGraw-Hill, Inc. 1995, 3rd ed.) Walther J.V.: Essentials of Geochemistry (Jones and Bartlett Publishers 2005)				

EASC2407 Mineralogy (6 of	credits)		Academic Year	2014	
Offering Department	Earth Scie	ences	Quota	30	
Course Co-ordinator	Prof M Su	n, Earth Sciences (minsun@hku.hk)			
Teachers Involved		n, Earth Sciences arth Sciences			
Course Objectives		To provide essential knowledge of mineralogy, to familiarize students with common minerals that are basis for study of petrography of igneous, sedimentary and metamorphic rocks.			
Course Contents & Topics	<ul> <li>Mineral crystallization, mineral chemistry</li> <li>Mineral symmetry, Miller indices</li> <li>Physical properties of minerals</li> <li>Mineral composition, structure and classification</li> <li>Identification of rock forming minerals-hand specimens</li> <li>Use of petrographic microscope</li> <li>Optical properties under plane polarized light</li> <li>Optical properties under orthoscopic illumination</li> <li>Optical properties under conoscopic illumination</li> <li>Identification of rock forming minerals-thin sections</li> <li>Precious minerals</li> <li>Chemical variations of minerals</li> <li>Trace elements</li> <li>Instrument analysis for minerals</li> </ul>				
Course Learning Outcomes	On successful completion of this course, students should be able to:  1. Describe the methods and systems used in classification of minerals. 2. Apply the physical and chemical properties used in identification of rock-forming mineralogy and mi structure. 3. Describe the principle of optical mineralogy. 4. Identify the common rock-forming minerals in hand specimens and thin sections. 5. Understand some principles of mineral chemistry.				
Pre-requisites and Co-requisites and mpermissible combination)	Pass in EA	ASC1402 Principles of geology			
Offer in 2014 - 2015	Y 1st	sem	Examination	Dec	
Offer in 2015 - 2016	Υ		'	'	
Course Grade	A+ to F				
Grade Descriptors	A	Demonstrate extensive knowledge and skills at an advanced levo outcomes. Show strong analytical and critical abilities and logical skills and techniques to solve problems. Critical use of data a conclusions. Apply highly effective organizational and presentational	thinking, and ability to appl and results to draw appro	y highly effective lab	
	В	Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply effective lab skills and techniques to solve problems. Correct use of data of results to draw appropriate conclusions. Apply effective organizational and presentational skills.			
		apply effective lab skills and techniques to solve problems. Corr	ect use of data of results		
	С	apply effective lab skills and techniques to solve problems. Corr	ect use of data of results skills required for attaining abilities and logical thinking ostly correct but some error	to draw appropriate g most of the course g, and ability to apply eous use of data and	
	C	apply effective lab skills and techniques to solve problems. Corr conclusions. Apply effective organizational and presentational skills. Demonstrate general but incomplete command of knowledge and learning outcomes. Show evidence of some analytical and critical moderately effective lab skills and techniques to solve problems. Mr.	ect use of data of results skills required for attaining abilities and logical thinking ostly correct but some erron organizational and presenta equired for attaining some of ut with limited analytical and o solve problems. Limited a	to draw appropriate g most of the course g, and ability to apply eous use of data and tional skills. of the course learning d critical abilities, and bility to use data and	
		apply effective lab skills and techniques to solve problems. Corr conclusions. Apply effective organizational and presentational skills. Demonstrate general but incomplete command of knowledge and learning outcomes. Show evidence of some analytical and critical moderately effective lab skills and techniques to solve problems. Moresults to draw appropriate conclusions. Apply moderately effective. Demonstrate partial but limited command of knowledge and skills routcomes. Show evidence of some coherent and logical thinking, be limited ability to apply partially effective lab skills and techniques to	skills required for attaining abilities and logical thinking ostly correct but some erron organizational and presenta equired for attaining some of the solve problems. Limited a solve problems. Limited a stive organizational and presskills required for attaining wherent thinking, and ability wilsuse of data and results a	to draw appropriate g most of the course g, and ability to apply leous use of data and tional skills. of the course learning d critical abilities, and sentational skills. g the course learning y to apply minimally and/or unable to draw	
Course Type	D Fail	apply effective lab skills and techniques to solve problems. Corr conclusions. Apply effective organizational and presentational skills. Demonstrate general but incomplete command of knowledge and learning outcomes. Show evidence of some analytical and critical moderately effective lab skills and techniques to solve problems. Moresults to draw appropriate conclusions. Apply moderately effective. Demonstrate partial but limited command of knowledge and skills routcomes. Show evidence of some coherent and logical thinking, b limited ability to apply partially effective lab skills and techniques to results to draw appropriate conclusions. Apply limited or barely effect personstrate little or no evidence of command of knowledge and outcomes. Lack of analytical and critical abilities, logical and ceffective or ineffective lab skills and techniques to solve problems.	skills required for attaining abilities and logical thinking ostly correct but some erron organizational and presenta equired for attaining some of the solve problems. Limited a solve problems. Limited a stive organizational and presskills required for attaining wherent thinking, and ability wilsuse of data and results a	to draw appropriate g most of the course g, and ability to apply leous use of data and tional skills. of the course learning d critical abilities, and bility to use data and sentational skills. g the course learning y to apply minimally and/or unable to draw	

& Learning Activities	Activities	Details	No. of Hours
	Lectures	12 sessions x 2 hours	24
	Laboratory	12 sessions x 2 hours	24
	Reading / Self study		100
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)
	Assignments		50
	Examination		50
Required/recommended reading and online materials	C. Klein and C.S. Hurlbat: Manual o W.D. Nesse: Introduction to Optical	f Mineralogy (Wiley, 1999, 1st ed.) Mineralogy (Oxford University Press, 1998, 2	2nd ed).

EASC2408 Planetary geo	logy (6 cred	lits)		Academic Year	2014	
Offering Department	Earth Scie	ences		Quota		
Course Co-ordinator	Dr M H Le	ee, Earth Sciences (mhlee@hku.hk	·)			
Teachers Involved	Dr M H Le	ee, Earth Sciences				
Course Objectives	distribution and rings, point of viremote se	This course provides students with an introduction to the origin, evolution, structure, composition and distribution of matter in the Solar System condensed in the form of planets, satellites, comets, asteroids and rings, with particular emphasis on surface features, internal structures and histories from a geological point of view. The course incorporates the findings from recent space investigations, planetary imagery, remote sensing and Earth analogues to extraterrestrial features into a fascinating portrayal of the geological activities and histories in our Solar System.				
Course Contents & Topics	Mercury, Neptune a	Formation, evolution, internal structure and surface processes of planetary bodies; the terrestrial planets Mercury, Venus, the Earth-Moon system, and Mars; the giant planets Jupiter, Saturn, Uranus, and Neptune and their moons; Pluto, Charon and the Kuiper Belt; asteroids, meteorites, comets and the Oort cloud; Origin of our Solar System.				
Course Learning Outcomes	1. Describ 2. Explain 3. Demon governing	On successful completion of this course, students should be able to:  1. Describe the basic features of our Solar System and its constituents.  2. Explain how this knowledge is acquired through observations and experiments.  3. Demonstrate knowledge and understanding of the key geological, physical and chemical processes governing the structure, formation and evolution of planetary bodies.  4. Compare and contrast our own planet Earth with other planetary bodies.				
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in E	Pass in EASC1401 Blue planet or EASC1402 Principles of geology or PHYS1650 Nature of the universe				
Offer in 2014 - 2015	Y 2nd	l sem		Examination	May	
Offer in 2015 - 2016	Υ	Υ				
Course Grade	A+ to F					
Grade Descriptors	В	Demonstrate thorough mastery of extensive knowledge and skills required for attaining all the course learnin outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, ar ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.  Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability			original thought, and apply highly effective ining at least most of ninking, and ability to	
	С	learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply				
	D	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					
		Lecture with laboratory component course				
Course Type	Lecture w	ith laboratory component course				
Course Teaching	Lecture w	•	Details		No. of Hours	
Course Teaching		s	Details 12 sessions x 2 ho	urs		
Course Teaching	Activitie	s			24	
Course Teaching	Activities Lectures Laborato	s	12 sessions x 2 hor		24	
Course Teaching & Learning Activities	Activities Lectures Laborato	ry / Self study	12 sessions x 2 hor	urs	24 24 100 Veighting in final	
Course Teaching & Learning Activities  Assessment Methods	Activities Lectures Laborato Reading Methods	ry / Self study	12 sessions x 2 hot	urs	24 24 100 Veighting in final course grade (%)	
Course Type Course Teaching & Learning Activities  Assessment Methods and Weighting	Activities Lectures Laborato Reading	ry / Self study ents	12 sessions x 2 hot	urs	No. of Hours  24  24  100  Veighting in final course grade (%)  20  50	

	Test		15
Required/recommended reading and online materials	N. McBride and I. Gilmour: An Introduction to the	Solar System (Cambridge University	Press, 2004)

EASC2409 Regional field	studies (6 d	credits)		Academic Year	2014
Offering Department	Earth Scie	ences		Quota	25
Course Co-ordinator	Dr J Ali, E	arth Sciences (jrali@hku.h	k)		
Teachers Involved	Prof M Su	arth Sciences n, Earth Sciences nang, Earth Sciences			
Course Objectives	Kong thro	ugh hands on studies and	duces geology of China, Tair field excursions. ajors in Geology (accredited	-	the vicinity of Hong
Course Contents & Topics	The cours	e will introduce the following	ng topics:		
	- Geologic - Recogni - Field rec - Stratigra - Field gec - Enginee - Manager	Il studies in Southern Chin cal history of S. China & Ta tion of rock units and mine ognition and description of phic measurements ology of active and passive ring geology ment of geological hazards ological mapping techniqu	iwan rals in the field geological structures margins		
Course Learning Outcomes	<ul> <li>have acc</li> <li>be able</li> <li>and miner</li> <li>have acc</li> <li>develop</li> </ul>	to undertake basic field cals. quired at least 3 days of ex	ents are expected to: ng of the geology of east As bservations, stratigraphic m perience in independent stra ogical field data in determi	leasurements and ide	entifications of rocks geological mapping
Pre-requisites and Co-requisites and mpermissible combination)		Pass in EASC1401 Blue Planet or EASC1402 Principles of Geology and consent of course coordinator			
Offer in 2014 - 2015	Y 1st	sem		Examination	No Exam
Offer in 2015 - 2016	Υ				
Course Grade	A+ to F				
Grade Descriptors	A	A Demonstrate an advanced level of understanding of the geology of the study sites, ability to give a detailed account of the geological history of the study region, as well as strong ability to produce good-quality reports on independent field measurements.			
	В	<b>B</b> 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.			
	С	Could only demonstrate an incomplete understanding of the geology of the study sites and some ability to make field observations and a basic knowledge on field measurement techniques.			
	D				
	Fail	·			
Course Type	Field cam	ps			
Course Teaching & Learning Activities	Activitie	s	Details		No. of Hours
Learning Activities	Field wor	k	15 days		100
	Reading	/ Self study			20
Assessment Methods and Weighting	Methods		Details		Weighting in fina course grade (%)
	Report				100
Required/recommended reading and online materials	Comprehe	ensive course notes provid	ed		

EASC3020 Global change: anthropogenic impacts (6 credits)		Academic Year	2014		
Offering Department	Earth Sciences Quota				
Course Co-ordinator	Dr Z H Liu, Earth Sciences (zhliu@hku.hk)				
Teachers Involved	Dr Z H Liu, Earth Sciences	Dr Z H Liu, Earth Sciences			
Course Objectives  This course will explore the role of humans in global change and the environmental responses to such anges. Causes and impacts of climate change will be discussed.			sponses to such		

Course Contents & Topic	evolution,	Global warming, greenhouse gas emission, past climates, climatic and environmental changes vs. culture evolution, natural vs. anthropogenic climate change, model projections of future climate change, scientific uncertainty, impacts of climate change, including sea level, fresh water, food, ecosystems and human health				
Course Learning Outcomes	1. Recogn 2. Recogn 3. Identify	On successful completion of this course, students should be able to:  1. Recognise the complexity of global climate systems. 2. Recognise the controversy of anthropogenic global warming. 3. Identify modern environmental issues. 4. Assess the credibility of various scientific arguments.				
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in E course	EASC2404 Introduction to atmosphere and	hydrosphere or ENVS2001 Environ	nmental field and lab		
Offer in 2014 - 2015	Y 1st	sem	Examination	Dec		
Offer in 2015 - 2016	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 course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Demonstrate course of data and results to draw appropriate and insightful conclusions. Show insightful use and critical analyse evaluation of information drawn from a full range of high quality sources and to quote/reference aptly.				
	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. Demonstrate correct use of data and results to draw appropriate conclusions. Show critical use of relevant information from sources and ability to make meaningful comparisons between different secondary interpretations and to quote/reference aptly.				
	С	C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Demonstrate mostly correct but some erroneous use of data and results to draw appropriate conclusions. Show use of relevant information from sources and ability to make comparisons between different interpretations and to quote/reference aptly.				
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Demonstrate limited ability to use data and results to draw appropriate conclusions. Show use and reference of several sources, but mainly through summary rather than analysis and comparison.				
	Fail					
Course Type	Lecture-b	ased course				
Course Teaching	Activitie	s	Details	No. of Hours		
& Learning Activities	Lectures			36		
	Project v	vork		30		
	Tutorials			12		
	Discussi	on		24		
	Reading	/ Self study		48		
Assessment Methods and Weighting	Methods	5	Details	Weighting in final course grade (%)		
	Essay		Coursework Assessment	25		
	Examina	tion	One 2-hour written examination	50		
	Project r	eport		25		

EASC3402 Petrology (6 cr	edits)	Academic Year	2014		
Offering Department	Earth Sciences	Quota			
Course Co-ordinator	Prof G Zhao, Earth Sciences (gzhao@hku.hk)				
Teachers Involved	Prof G Zhao, Earth Sciences Prof M Sun, Earth Sciences Dr M Pittman, Earth Sciences				
Course Objectives	To give students an understanding of the features in sedime as the ability to identify major rock types and their texture under microscope.				
Course Contents & Topics	<ul> <li>- Magma and magmatism; textures and structures of igneous rocks, classification of igneous rocks, including volcanism and plutonism</li> <li>- Basic igneous rocks</li> <li>- Intermediate igneous rocks</li> <li>- Acid igneous rocks</li> <li>- Sedimentary diagenesis, classification of sedimentary rocks; textures and structures of sedimentary rocks.</li> <li>- Clastic sedimentary rocks: conglomerate and sandstone, siltstone and mudstone</li> <li>- Biochemical sedimentary rocks: limestone and dolostone</li> <li>- Metamorphism; controlling factors of metamorphism; textures and structures of metamorphic rocks;</li> </ul>				

	classification of metamorphic rocks - Meta-pelitic rocks - Meta-basic rocks - Meta-carbonate rocks and meta-felsic rocks					
Course Learning Outcomes	On successful completion of this course, students should be able to:  1. Identify major igneous rocks and their textures and structures in both hand specimens and under microscope.  2. Identify major sedimentary rocks and their textures and structures in both hand specimens and under microscope.  3. Identify major metamorphic rocks and their textures and structures in both hand specimens and under microscope.  4. Make full description and write report on the above rock types.					
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in E	ASC2407 Mineralogy				
Offer in 2014 - 2015	Y 2nd	2nd sem Examination May			May	
Offer in 2015 - 2016	Υ	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.					
	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.				
	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 w	ith laboratory component course				
Course Teaching	Activitie	s	Details		No. of Hours	
& Learning Activities	Lectures		12 sessions x 2 hour	rs	24	
	Laborato	Laboratory		ons & thin- ons under	24	
	Reading	/ Self study			100	
Assessment Methods and Weighting	Methods		Details		Weighting in final course grade (%)	
	Assignme	ents			50	
	Examina	tion			50	
Required/recommended reading and online materials	Harvey BI	att and Robert J. Tracy, Petrology (Seco	ond Edition; W.H. Fren	man and Compa	any, New York)	

EASC3403 Sedimentary e	nvironments (6 credits)	Academic Year	2014		
Offering Department	Earth Sciences	Quota			
Course Co-ordinator	Dr S C Chang, Earth Sciences (suchin@hku.hk)				
Teachers Involved	Dr S C Chang, Earth Sciences Dr J King, Earth Sciences				
Course Objectives	This course discusses the origin, diagenesis, classification and rocks. Students will learn features and processes of sedimentary grocesses.				
Course Contents & Topics	<ul> <li>Overview of sedimentary geology</li> <li>Physics of erosion, transportation and sedimentation</li> <li>Sedimentary structures</li> <li>Depositional environments (non-marine)</li> <li>Depositional environments (marine)</li> <li>Sequence stratigraphy</li> <li>Basin analysis</li> <li>Sedimentary environment around Hong Kong</li> <li>Sedimentary environment on Mars</li> </ul>				
Course Learning Outcomes	On successful completion of this course, students should be able to:  1. Describe the nature and significance of sedimentary features and structures.  2. Identify carbonate and siliciclastic rocks in hand sample.  3. Describe the facies in a depositional environment.				
	425				

		<ul><li>4. Undertake detailed study of a stratigraphic section in the field.</li><li>5. Conduct basic observations and interpretations from outcrops.</li></ul>				
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in E	Pass in EASC2402 Field methods or EASC3402 Petrology				
Offer in 2014 - 2015	Y 2nd	d sem	Examination	May		
Offer in 2015 - 2016	Υ	Υ				
Course Grade	A+ to F					
Grade Descriptors	A		t. Show strong analytical abilities and logical ieldwork skills and techniques. Apply highly e			
	В		ect. Show strong analytical abilities and logic ghly effective organizational and presentational			
	С		of the subject. Show some analytical abilities techniques. Apply moderately effective organi			
	D	Demonstrate partial but limited grasp of the subject. Show some analytical abilities and logical thinking. Apply partially effective lab/fieldwork skills and techniques. Apply limited or barely effective organizational and presentational skills.				
	Fail  Demonstrate little or no grasp of the subject. Evidence of little or lack of analytical abilities and logical thinking. Apply minimally effective lab/fieldwork skills and techniques. Organization and presentational skills are ineffective.					
Course Type	Lecture w	ith laboratory component course				
Course Teaching	Activities Details		Details	No. of Hours		
& Learning Activities	Lectures		12 sessions x 2 hours	24		
	Laboratory		6 sessionsx 2 hours	12		
	Field work		1 day trip with field project	8		
	Project work		Examples for sedimentary environments	12		
	Reading	/ Self study		90		
Assessment Methods and Weighting	Methods	<b>3</b>	Details	Weighting in final course grade (%)		
	Examina	tion		40		
	Laborato	ry reports		20		
	Presenta	tion		10		
	Test		Mid-term examination	30		
Required/recommended reading and online materials	Sediment	ology and Stratigraphy (Second Edition	n), Gary Nichols			

EASC3404 Structural geolo	ogy (6 credits)	Academic Year	2014
Offering Department	Earth Sciences	Quota	40
Course Co-ordinator	Dr J R Ali, Earth Sciences (jrali@hku.hk)		
Teachers Involved	Dr J R Ali, Earth Sciences		
Course Objectives	The course covers the mechanical properties of rocks and how and and their use in interpreting structure.	I why rocks deform,	geological maps
Course Contents & Topics	- Stress, strain, stress-strain relation, Mohr circle techniques; - Strain types; - Stereonets; - Faults: strike-slip faults, dip-slip faults and thrusts; - Joints; - Extensional structures, listric faults; - Folds; Satellite folds; - Shear Zones; - Fabrics (foliations, lineations); - Pressure solution cleavages; - Microscopic deformation, Dislocations; - Structurally focused map interpretation; - Key Structures in HK.		
Course Learning Outcomes	On successful completion of this course, students should be able to:  1. Understand a moderate level rock deformation.  2. Interpret structural data from a geology map.  3. Plot and interpret structural data on a stereonet.  4. Appreciate 3D rock and 4D rock-time relationships.		
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in EASC2402 Field methods and EASC3402 Petrology		

Offer in 2014 - 2015	Y 1st	t sem	Examination	Dec		
Offer in 2015 - 2016	Υ					
Course Grade	A+ to F	A+ to F				
Grade Descriptors	A Thorough grasp of the subject; evidence of strong critical abilities and logical thinking; apply knowledge to a wide 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.					
	В					
	C 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.					
	D	i i				
	Fail	Little or no grasp of the knowledge and undo coherent thinking; very little or no ability to a fieldwork skills and techniques; misuse of data or inapt integration of theories, principles, evid	apply knowledge to solve problems; minima a and results and/or unable to draw appropria	Ily effective or ineffective		
Course Type	Lecture v	vith laboratory component course				
Course Teaching	Activitie	9S	Details	No. of Hours		
& Learning Activities	Lectures		eleven 2-hour sessions	22		
	Laboratory		stereonets, map interpretation with a structural focus	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 study 56					
Assessment Methods and Weighting	Method	s	Details	Weighting in final course grade (%)		
	Assignm	nents		50		
	Examination 50					
Required/recommended reading and online materials		Park, R. G.: Foundations of Structural Geology (Blackie, 1989) Davies and Reynolds 1996; Ben A. van der Pluijm & Stephen Marshak. 2004.				
Additional Course Information		I geology has lots of associated textboo	ks and web hosted materials, so th	e three named works		

<b>EASC3405</b> Environmental	EASC3405 Environmental remote sensing (6 credits)						
Offering Department	Earth Sciences	Quota	25				
Course Co-ordinator	Prof Y Zong, Earth Sciences (yqzong@hku.hk)						
Teachers Involved	TBC, Earth Sciences TBC, Earth Sciences						
Course Objectives	This course provides an introduction to the methods an from a distance with instruments carried by satellites or a and atmosphere for inferring the nature and characte atmosphere and for solving environmental problems.	ircraft, the spectral features of th	e earth's surfac				
Course Contents & Topics	3. Image procesing, analysis, evaluation and interpretatio	1. Basic princioles of remotesensing     2. Key remote sensing platforms, sensers and their purposes     3. Image procesing, analysis, evaluation and interpretation     4. Integration with environmental geographic information systems					
Course Learning Outcomes	On successful completion of this course, students should  1. demonstrate knowledge of how remotely sensed data at 2. comprehend the basic techniques of image processing 3. handle remotely sensed data within geographic informat 4. understand how remotely sensed be used for environm 5. evaluate and interpret remotely sensed data, and 6. present and discuss results.	are acquired, ation systems					
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in BIOL2306 Ecology and evolution or EASC2404 ENVS2001 Environmental field and lab course or ENVS2						
Offer in 2014 - 2015	N	Examination					
Offer in 2015 - 2016	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.			
	B Well organised, appropriate structure. Well written, clear summary and conclusions. Good use of appropriate graphs, diagrams, figures, tables and maps. Good analysis and interpretation of results, supported by some background reading.				
	С		writing is satisfactory, summary and/o agrams, figures, tables and maps. Compe		
	D				
	Fail		orly written, summary and /or conclusions s, diagrams, figures, tables and maps. Lit sion very basic or absent.		
Course Type	Lecture	with laboratory component course			
Course Teaching	Activiti	es	Details	No. of Hours	
& Learning Activities	Lecture	s		18	
	Laboratory			12	
	Project	work		12	
	Discuss	ion		6	
	Reading	/ Self study		100	
Assessment Methods and Weighting	Method	ls	Details	Weighting in final course grade (%)	
	Present	ation	Project presentation	10	
	Project report		Individual project report 90		
Required/recommended reading and online materials	Remote Sensing and Image Interpretation [6th edition], Thomas Lillesand et al., 2007 Computer processing of remotely sensed images: an introduction, Mather and Koch, 2011 Environmental remote sensing and system analysis, Chang, 2012				
Additional Course Information	Due to th	ne restriction of lab space, places			

EASC3406 Reconstruction	of past cl	mate (6 credits)		Academic Year	2014			
Offering Department	Earth Scie	Earth Sciences  Quota Dr S H Li, Earth Sciences (shli@hku.hk)						
Course Co-ordinator	Dr S H Li,	Earth Sciences (shli@hku.hk)						
Teachers Involved		Earth Sciences an, Earth Sciences						
Course Objectives		This course provides students with an understanding of how dynamic earth is and how it has changed over the last 2.6 million years. This course introduces the theory and methods of climate reconstructions.						
Course Contents & Topics	Ice sheet Driven for Quantitati Pollen and Climate cl Quaternal Sea-level Climate cl	ernary period (1), in north hemisphere(1), ces of climate change (1) re reconstruction methods (1) alysis and biological proxies (2) ange in arid regions (1) by geochronology (1) and coastal change (1) anges in East Asia (1) ange impacts on human evolution rming and future climate change (1						
Course Learning Outcomes	1. Unders 2. Unders 3. Learn tl 4. Unders	ccessful completion of this course, and the earth climate change durin and the driving forces of climate ch he methods for palaeo-environment and the impacts of climate change: size and interpret data sets of clima	g last 2.6 million years. langes in different scales. reconstruction. s.					
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in E	ASC2401 Fluid/solid interactions in	earth processes					
Offer in 2014 - 2015	N			Examination				
Offer in 2015 - 2016	Υ							
Course Grade	A+ to F							
Grade Descriptors	A	Demonstrate thorough mastery at an ad course learning outcomes. Show strong thought, and ability to apply knowledge effective organizational and presentation	analytical and critical abilities a to a wide range of complex, far	ind logical thinking, with e	vidence of original			
		Demonstrate substantial command of a	broad range of knowledge and	skills required for attaining	ng at least most of			

	В	the course learning outcomes. Show evi apply knowledge to familiar and some unf			
	С	learning outcomes. Show evidence of so	mmand of knowledge and skills required ome analytical and critical abilities and log oly moderately effective organizational and	ical thinking, and ability to apply	
	D	outcomes. Show evidence of some cohe	of knowledge and skills required for attai erent and logical thinking, but with limite to solve problems. Apply limited or bar	d analytical and critical abilities.	
	Fail	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.			
Course Type	Lecture v	vith laboratory component course			
Course Teaching & Learning Activities	Activities		Details	No. of Hours	
& Learning Activities	Lectures		12 sessions x 2 hours	24	
	Laboratory		2 sessions	4	
	Field work		1 half-day fieldtrip	5	
	Tutorials		8 sessions	16	
	Reading	J / Self study		90	
Assessment Methods and Weighting	Method	s	Details	Weighting in final course grade (%)	
	Assignm	nents		50	
	Examina	ation		50	
Required/recommended reading and online materials	J.J. Lowe and M.J.C. Walker Reconstructing Quaternary Environments. (Harlow, Essex : Addison Wes Longman, 1997, 2nd ed) W.F. Ruddiman: Earths climate: Past and future (Freeman, 2008, 2nd ed.) D.E. Anderson, A.S. Goudie and A.G. Parker: Global Environments through the Quaternary (Oxford, 200				
Additional Course Information	Previous	course code & title: EASC2131 A C	ool World: Ice Ages and Climate C	Change	

<b>EASC3408 Geophysics</b>	Academic Year	2014					
Offering Department	Earth Scie	ences	Quota				
Course Co-ordinator	Prof P Wu	Prof P Wu, Earth Sciences (ppwu@hku.hk) Prof P Wu, Earth Sciences					
Teachers Involved	Prof P Wu	ı, Earth Sciences					
Course Objectives	geophysic	An overview of the geophysical characteristics and processes of the solid earth and a survey of the various geophysical disciplines, including seismology, gravity, geothermometry, geomagnetism and paleomagnetism as well as exploration geophysical methods for studying the earth's interior and near subsurface structure.					
Course Contents & Topics	- Earthqua - Seismici - Seismicit - Gravity a - Isostasy - Geomag - Paleoma - Thermal - Applied ( - Applied (	Dimension and Motion in Space ake Seismology waves and free oscillations ty Analysis and gravity anomalies and Geodesy inetism agnetism and rock magnetism Properties of the Earth Geophysical Methods: Electrical methods Geophysics in HK					
Course Learning Outcomes	1. Describ 2. Apply b 3. Describ 4. Undersi	On successful completion of this course, students should be able to:  1. Describe the approaches and methods geophysicists use to study the interior of the earth.  2. Apply basic techniques in measurements of earthquakes and interpret a seismogram.  3. Describe the procedure to determine gravity anomalies and their interpretation.  4. Understand the methods of paleomagnetism and describe the processes of rock magnetisation.  5. Describe how density, pressure and temperature of the earth's interior are determined.					
Pre-requisites (and Co-requisites and Impermissible combination)		ASC2401 Fluid/solid interactions in earth processes or EAS ry mechanics	C2402 Field metho	ds or PHYS2250			
Offer in 2014 - 2015	Y 2nd	sem	Examination	May			
Offer in 2015 - 2016	Υ						
Course Grade	A+ to F						
Grade Descriptors	A	Demonstrated an in-depth understanding of the subject well above the expachieving over 80% of total marks and an ability to pursue advance-level st					
	В	Demonstrate an understanding of the subject at the appropriate level of total course marks. A greater effort and further preparation are needed geophysics.					
		Coursework and examination results reflect only only a basic understanding $429$	ng of the subject without	the ability to carry out			

	С	in-depth analysis. Achieved 60-70% of total co	ourse marks.			
	D	Demonstrated an insufficient understanding of reflective only of the time the student puts in or	f the subject as total course mark achieved is belon the subject.	ow 60%. The pass grade is		
	Fail	A total lack of effort and insufficient ability to understand the subject and failure to achieve 50% of the available marks.				
Course Type	Lecture	with laboratory component course				
Course Teaching & Learning Activities	Activities		Details	No. of Hours		
	Lecture	s	12 sessions x 2 hours	24		
	Laborat	ory	8 paper exercises, 2 field exercises on exploration geophysical methods	24		
	Readin	g / Self study		100		
Assessment Methods and Weighting	Method	is	Details	Weighting in final course grade (%)		
	Examin	ation		60		
	Laborat	ory reports		40		

LACCOTOS Igricous ana il	ietainoi pini	c petrogenesis (6 credits)	Academic Year	2014			
Offering Department	Earth Scient	ences	Quota	30			
Course Co-ordinator	Prof M Su	n, Earth Sciences (minsun@hku.hk)					
Teachers Involved	Prof M Sun, Earth Sciences Prof G Zhao, Earth Sciences						
Course Objectives	To provide a comprehensive coverage of the principles and techniques used in the study of petrogenesis of igneous and metamorphic rocks and their cause-and-effect relationships with tectonic settings and crustal evolution.						
Course Contents & Topics  Course Learning Outcomes	- Applicati - Basaltic - Granitic - Magmati - Magmati - Types of - Chemica etc) - Metamo - Metamo - Metamo - Metamo - Metamo - Metamo - Metamo - Metamo - On succes	generation: physiochemical conditions and tectonion of trace elements and isotopes to the study of magmatism and mantle characteristics magma and crustal characteristics sm and crustal growth metamorphism all equilibrium/disequilibrium in metamorphism; multiplic processes and reactions rephic petrogenesis and evolution of pelitic rocks rephic petrogenesis and evolution of mafic rocks rephism in different tectonic settings; metamorphinic implications.	magma genesis etamorphic phase diagrams ( c pressure-temperature-time	(P-T-t) paths and			
	major igne	ck associations, textures, structures and geochen eous rocks.		ne petrogenesis (			
Pro-roquisitos	major igne 2. Use ma 3. Apply n infer the to 4. Demon and-effect	eous rocks.  Igmatic rocks to study the mantle and crustal char- nineral assemblages, microtextures, mineral react- ectonothermal evolution of metamorphic rocks.  It is the knowledge and understanding of magmatical relationships with tectonic settings and crustal evolutions.	racteristics. ion relationships and metamo	orphic P-T paths t			
and Co-requisites and	major igne 2. Use ma 3. Apply n infer the to 4. Demon and-effect	eous rocks.  Igmatic rocks to study the mantle and crustal chare  Inneral assemblages, microtextures, mineral react  In ectonothermal evolution of metamorphic rocks.  It is strate knowledge and understanding of magmati	racteristics. ion relationships and metamo	orphic P-T paths t			
and Co-requisites and mpermissible combination)	major igne 2. Use ma 3. Apply n infer the to 4. Demon and-effect Pass in E.	eous rocks.  Igmatic rocks to study the mantle and crustal char- nineral assemblages, microtextures, mineral react- ectonothermal evolution of metamorphic rocks.  It is the knowledge and understanding of magmatical relationships with tectonic settings and crustal evolutions.	racteristics. ion relationships and metamo	orphic P-T paths t			
and Co-requisites and mpermissible combination) Offer in 2014 - 2015	major igne 2. Use ma 3. Apply n infer the to 4. Demon and-effect Pass in E.	eous rocks.  Igmatic rocks to study the mantle and crustal chare  Inneral assemblages, microtextures, mineral react  ectonothermal evolution of metamorphic rocks.  Istrate knowledge and understanding of magmati  relationships with tectonic settings and crustal events of the settings and crustal events.	racteristics. ion relationships and metamo c and metamorphic processe volution.	orphic P-T paths as and their caus			
and Co-requisites and mpermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016	major igne 2. Use ma 3. Apply n infer the te 4. Demon and-effect Pass in E.	eous rocks.  Igmatic rocks to study the mantle and crustal chare  Inneral assemblages, microtextures, mineral react  ectonothermal evolution of metamorphic rocks.  Istrate knowledge and understanding of magmati  relationships with tectonic settings and crustal events of the settings and crustal events.	racteristics. ion relationships and metamo c and metamorphic processe volution.	orphic P-T paths to			
Pre-requisites (and Co-requisites and mpermissible combination) (Offer in 2014 - 2015 (Offer in 2015 - 2016 (Course Grade (Grade Descriptors	major igne 2. Use ma 3. Apply n infer the te 4. Demon and-effect Pass in E.  Y 2nd Y	eous rocks.  Igmatic rocks to study the mantle and crustal chare  Inneral assemblages, microtextures, mineral react  ectonothermal evolution of metamorphic rocks.  Istrate knowledge and understanding of magmati  relationships with tectonic settings and crustal events of the settings and crustal events.	racteristics. ion relationships and metamo c and metamorphic processe rolution.  Examination  Inced level required for attaining all d logical thinking, and ability to app of data and results to draw appro	orphic P-T paths to a sand their cause.  May  I the course learning by highly effective later.			
and Co-requisites and mpermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade	major igne 2. Use ma 3. Apply n infer the te 4. Demon and-effect Pass in E.  Y 2nc Y A+ to F	Demonstrate extensive knowledge and skills at an adva outcomes. Show strong analytical and critical abilities an skills and techniques to solve problems. Critical use of signature of the solutions of the strate with the confidence of the solution of the solution of the strate of the solution of the so	racteristics. ion relationships and metamor c and metamorphic processe rolution.  Examination  Examination  Inced level required for attaining all d logical thinking, and ability to app of data and results to draw appro entational skills.  nowledge and skills required for atta all and critical abilities and logical ti ms. Correct use of data of results	orphic P-T paths to a sand their cause.  May  I the course learning by highly effective late priate and insightful ining at least most on hinking, and ability to			
and Co-requisites and mpermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade	major igne 2. Use ma 3. Apply n infer the te 4. Demon and-effect  Pass in E.  Y 2nc  Y  A+ to F	peous rocks.  Igmatic rocks to study the mantle and crustal char  Inneral assemblages, microtextures, mineral react  ectonothermal evolution of metamorphic rocks.  Istrate knowledge and understanding of magmatic  relationships with tectonic settings and crustal evolutionships with tectonic settings and crustal evolutions.  Demonstrate extensive knowledge and skills at an advaoutcomes. Show strong analytical and critical abilities an skills and techniques to solve problems. Critical use of conclusions. Apply highly effective organizational and present the course learning outcomes. Show evidence of analytic apply effective lab skills and techniques to solve problems.	cacteristics. ion relationships and metamor c and metamorphic processe rolution.  Examination  Examination  Inced level required for attaining all d logical thinking, and ability to app of data and results to draw appro entational skills. required for attaining all and critical abilities and logical ti ans. Correct use of data of results and skills required for attaining d critical abilities and logical thinking blems. Mostly correct but some error	may  May  The course learning by highly effective lat priate and insightful ining at least most on hinking, and ability to draw appropriate g most of the course g, and ability to apply leous use of data an			
and Co-requisites and mpermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade	major igne 2. Use ma 3. Apply n infer the te 4. Demon and-effect  Pass in E.  Y A+ to F  A  B	peous rocks. Igmatic rocks to study the mantle and crustal chart inneral assemblages, microtextures, mineral react ectonothermal evolution of metamorphic rocks. Strate knowledge and understanding of magmatic relationships with tectonic settings and crustal evolutionships with tectonic settings and crustal evolutionships with tectonic settings and crustal evolutions. Ascardage of the set of the	Examination  C and metamorphic processes colution.  Examination  Examination  Examination  Examination  C and metamorphic processes colution.  Examination  Examination  C attaining all d logical thinking, and ability to apport data and results to draw approentational skills.  Correct use of data of results consults with simulational skills.  Examination  Correct use of data of results consults with simulation of critical abilities and logical thinking degrees. Mostly correct but some error effective organizational and presented skills required for attaining some of the consults of th	May  The course learning by highly effective lat priate and insightfur to draw appropriate g most of the course g, and ability to apply leous use of data anational skills.  Of the course learning d critical abilities, and bility to use data and the course learning the course learning the course learning the course learning the course learning the course learning to the course learning the course learning to the course learning to the course learning the course learning to the course learning the cours			

	outcomes. Lack of analytical and critical abilities, logical and coherent thinking, and ability to appl effective or ineffective lab skills and techniques to solve problems. Misuse of data and results and/or una appropriate conclusions. Organization and presentational skills are minimally effective or ineffective.				
Course Type	Lecture with laboratory component course				
Course Teaching	Activities	Details	No. of Hours		
& Learning Activities	Lectures		24		
	Laboratory		24		
	Reading / Self study		100		
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)		
	Assignments		50		
	Examination		50		
Required/recommended reading and online materials	M.G. Best: Igneous and Metamorphic Petrolo	gy (Oxford Blackwell Science	ce, 2003, 2nd ed.)		
Additional Course Information	John D Winter: An Introduction to Igneous an	d Metamorphic Petrology (F	Prentice Hall, 2001)		

,	y (6 credits)				Academic Year	2014	
Offering Department	Earth Scient	nces			Quota	40	
Course Co-ordinator	Prof J J J	ao, Earth Scien	ces (jjiao@hku.hk)				
Teachers Involved	Prof J J J	ao, Earth Scien	ces				
Course Objectives	reference 2) well h	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) well hydraulics and evaluation of groundwater as a resource; and 3) influence of groundwater on geotechnical and environmental engineering					
Course Contents & Topics	Properties Hydraulic Basic Equ Groundwa Analysis ( Well insta Regional	Hydrologic Cycle And water Budgets, Introduction to Hydrogeology (1 Week) Properties Of Aquifers (2 Weeks) Hydraulic head and flow net(2 Weeks) Basic Equations of Groundwater Flow (1 Week) Groundwater Flow To Wells (1 Week) Analysis Of Aquifer Test(2 Weeks) Well installation & pumping test design(1 Week) Regional Groundwater Flow Systems (HK case study)(1 Week) Groundwater contamination (China case study)(Week 12)					
Course Learning Outcomes	1. Apprec 2. Under groundwa 3. Apprec 4. Unders principles	On successful completion of this course, students should be able to:  1. Appreciate the importance of hydrogeology in geotechnical and environmental engineering.  2. Understand basic concepts of hydrological cycle and water balance, and interaction between groundwater and surface water.  3. Appreciate the close relationship between groundwater system and geology and topography.  4. Understand basic concepts of aquifer and aquifer properties, hydraulic head, flow net, and basic principles of groundwater flow.  5. Use basic field aquifer tests to estimate some important aquifer parameters					
		no nota aquitor	lesis to estimate son	e important aquiler p	arameters		
Pre-requisites (and Co-requisites and Impermissible combination)		ASC2402 Field		е широпант адишег р	arameters		
and Co-requisites and mpermissible combination)		•		e important aquiler p	Examination	Dec	
(and Co-requisites and mpermissible combination) Offer in 2014 - 2015		SC2402 Field		е штропант аччитет р		Dec	
(and Co-requisites and Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016	Y 1st	SC2402 Field		е штропант аччитет р		Dec	
(and Co-requisites and	Y 1st	SC2402 Field  sem  Demonstrate the course learning thought, and at	orough mastery at an adva	unced level of extensive kn nalytical and critical abilitie to a wide range of comp	Examination  nowledge and skills requires and logical thinking, with	ed for attaining all the	
(and Co-requisites and Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade	Y 1st Y A+ to F	Sem  Demonstrate the course learning thought, and at organizational at Demonstrate su the course learn	orough mastery at an advoutcomes. Show strong a proper to apply knowledge and presentational skills.	inced level of extensive kr nalytical and critical abilitie	Examination  nowledge and skills requires and logical thinking, with practical problems. A land skills required for attatical abilities and logical to the second state of the second skills required for attatical abilities and logical to the second state of the second state of the second state of the second skills required for attatical abilities and logical to the second state of the	ed for attaining all the th evidence of origina Apply highly effective aining at least most of hinking, and ability to	
(and Co-requisites and Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade	Y 1st Y A+ to F	Demonstrate the course learning thought, and at organizational are personal	orough mastery at an advalunt outcomes. Show strong a slifty to apply knowledge and presentational skills. bestantial command of a bing outcomes. Show evice to most practical problem neral but incomplete comes. Show evidence of sor	inced level of extensive kr nalytical and critical abilitie to a wide range of comp road range of knowledge a ence of analytical and cri	Examination  nowledge and skills requires and logical thinking, with solex practical problems. And skills required for attatical abilities and logical titional and presentational skills required for attainin bilities and logical thinkin	ed for attaining all the th evidence of origina Apply highly effective aining at least most o hinking, and ability to skills. g most of the course g, and ability to apply	
(and Co-requisites and Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade	Y 1st Y A+ to F A B	Demonstrate the course learning thought, and at organizational ar Demonstrate su the course learn apply knowledge to so Demonstrate pa outcomes. Show	prough mastery at an advaluation of a batantial command of a batantial command of a batantial command of a batantial command of a batantial command of a batantial command of a batantial command of a batantial or most practical problem or as Show evidence of some practical problems. Apartial but limited command we evidence of some cohe illity to apply knowledge to	anced level of extensive kr nalytical and critical abilitie to a wide range of comp road range of knowledge a ence of analytical and cri s. Apply effective organiza mand of knowledge and ne analytical and critical a	Examination  nowledge and skills requires and logical thinking, with solex practical problems. A land skills required for attatical abilities and logical thinking an and presentational	ed for attaining all the the evidence of origina Apply highly effective aining at least most of hinking, and ability to skills.  g most of the course g, and ability to apply tional skills.  of the course learning I and critical abilities.	
(and Co-requisites and Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade	Y 1st Y A+ to F A B C	Demonstrate the course learning thought, and at organizational at Demonstrate ge learning outcom knowledge to so Demonstrate pa outcomes. Show limited ab and presentation Demonstrate litt outcomes. Lack	orough mastery at an adva outcomes. Show strong a proper street of the street of the dility to apply knowledge and presentational skills. betantial command of a b sing outcomes. Show evice to most practical problem neral but incomplete comes. Show evidence of some me practical problems. Ap trial but limited command we vidence of some cohe ility to apply knowledge to all skills.	anced level of extensive kr nalytical and critical abilitie to a wide range of comp road range of knowledge a ence of analytical and critical a ply moderately effective or of knowledge and skills re rent and logical thinking,	Examination  nowledge and skills requires and logical thinking, with a still and skills required for attained abilities and logical thinking and skills required for attainin bilities and logical thinking anizational and presentational and presenta quired for attaining some but with limited analytica Apply limited or barely eskills required for attaining thinking. Show very little	ed for attaining all the the evidence of origina Apply highly effective aining at least most of hinking, and ability to skills.  g most of the course g, and ability to apply tional skills.  of the course learning I and critical abilities. Iffective organizational g the course learning e or no ability to apply	
(and Co-requisites and Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade	Y 1st Y A+ to F  A B C D Fail	Demonstrate the course learning thought, and at organizational an Demonstrate su the course learning outcomes. Show show limited ab and presentation Demonstrate itt outcomes. Lack knowledge to so	orough mastery at an adva outcomes. Show strong a proper street of the street of the dility to apply knowledge and presentational skills. betantial command of a b sing outcomes. Show evice to most practical problem neral but incomplete comes. Show evidence of some me practical problems. Ap trial but limited command we vidence of some cohe ility to apply knowledge to all skills.	anced level of extensive knalytical and critical abilitie to a wide range of comproad range of knowledge and comproad range of knowledge and ne analytical and critical aply moderately effective or of knowledge and skills rerent and logical thinking, a solve practical problems.	Examination  nowledge and skills requires and logical thinking, with a still and skills required for attained abilities and logical thinking and skills required for attainin bilities and logical thinking anizational and presentational and presenta quired for attaining some but with limited analytica Apply limited or barely eskills required for attaining thinking. Show very little	ed for attaining all the the evidence of origina Apply highly effective aining at least most of hinking, and ability to skills.  g most of the course g, and ability to apply tional skills.  of the course learning I and critical abilities. Iffective organizational g the course learning e or no ability to apply	

	Lectures	12 sessions x 2 hours	24
	Laboratory	10 x 2 hours	20
	Field work	Half day field trip	5
	Reading / Self study		100
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)
	Assignments		30
	Examination		70
Required/recommended reading and online materials	C. W. Fetter: Applied Hydrogeology	(Pearson Education Limited, 2014, 4th ed.)	

s (6 credits		Academic Year	2014		
Earth Scie	ces	Quota	40		
Prof M F Z	nou, Earth Sciences (mfzhou@hku.hk)				
	Prof M F Zhou, Earth Sciences Prof G Zhao, Earth Sciences				
understand In addition	To provide students with knowledge about the classification of mineral deposits and their basic features; to understand the processes that lead to their formation; to gain hand on experience with mining procedures In addition, students should gain knowledge about the world wide distributions of mineral and industrial resources.				
mineral de	posit, mineral deposit models, magmatic oxid	de and sulfide deposits, skarn	deposits, porphyre		
On succes	ful completion of this course, students should	be able to:			
<ol> <li>Underst</li> <li>Underst</li> </ol>	nd factors that are key to the formation of me nd the controls of earth resources in a global	tallic and industrial resources. scale.	eposits.		
Pass in EA	SC2402 Field methods or EASC3402 Petrolog	gy			
Y 1st	em	Examination	Dec		
Υ					
A+ to F	A+ to F				
A	Demonstrate thorough understanding at an advanced level of extensive knowledge and skills with evidence for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking. Evidence of original thoughts, excellent field observation and ability to solve problems. Highly effective organization and presentation skills.				
В	Demonstrate substantial understanding at an advanced level of extensive knowledge and skills with evidence for attaining 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.				
С	Demonstrate general but incomplete understanding required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking. Moderately effective organization and presentation skills.				
D	Demonstrate partial but limited understanding for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to solve problems. Apply limited or barely effective organizational and presentational skills.				
Fail	No or little knowledge about the subject. No evidence for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Very little or no ability for field observation and for solving problems. Poor organization and presentational skills.				
Lecture wi	a laboratory component course				
Activities	Detail	ls	No. of Hours		
Lectures			20		
Laborator			20		
Field work	1 over	rseas camp	4(		
Reading / Self study			100		
Methods		ls	Weighting in fina		
Assignme	nts Overs	ea field trip	20		
Examination Oversea field					
Examinati	on		60		
	Earth Scien Prof M F Zh Prof M F Zh Prof G Zhad To provide understand In addition, resources. Concepts in mineral dep deposits, vc On success 1. Understa 2. Understa 3. Understa 4. Understa 7 Ist si Y A+ to F A B C D Fail Lecture with Activities Lectures Laboratory Field work Reading / S Methods	Prof G Zhao, Earth Sciences  To provide students with knowledge about the classificat understand the processes that lead to their formation; to In addition, students should gain knowledge about the resources.  Concepts in mineral deposits and mining industrial; e mineral deposit, mineral deposit models, magmatic oxid deposits, volcanogenic massive sulfide deposits, coal, oi  On successful completion of this course, students should the terminology and nomenclature in the resources in a global deposits and the terminology and nomenclature in the resources in a global deposits and the controls of earth resources in a global deposits in EASC2402 Field methods or EASC3402 Petrological Pass in EASC2402 Field methods or EASC3402 Petrological Pass in EASC2402 Field methods or EASC3402 Petrological Pass in EASC3402 Field methods or EASC3402 Field methods or EASC3402 Field methods or EASC3402 Field methods or EASC3402 Field methods or EASC3402 Field methods or EASC3402 Field observation and presentation skills.  B Demonstrate thorough understanding at an advance attaining all the course learning outcomes. Show and original thoughts, excellent field observation. Effect C  Demonstrate general but incomplete understanding resonations skills.  D Demonstrate partial but limited understanding for attain some coherent and logical thinking, but with limited problems. Apply limited or barely effective organization and critical abilities, logical and coherent thinking. V problems. Poor organization and presentational skills.  Lecture with laboratory component course  Activities Detail  Lectures Laboratory  Field work 1 over	Prof M F Zhou, Earth Sciences (m/zhou@hku.hk)  Prof M F Zhou, Earth Sciences Prof G Zhao, Earth Sciences To provide students with knowledge about the classification of mineral deposits and the understand the processes that lead to their formation; to gain hand on experience with in addition, students should gain knowledge about the world wide distributions of mi resources.  Concepts in mineral deposits and mining industrial; exploration and mining method mineral deposit, mineral deposits models, magmatic oxide and sulfide deposits, skarn deposits, volcanogenic massive sulfide deposits, coal, oil and aga, resource evaluation.  On successful completion of this course, students should be able to:  1. Understand the terminology and nomenclature in the mining industrial and mineral de; 2. Understand the cotrols of earth resources in a global scale.  4. Understand methods of exploration and exploitation for mineral deposits.  Pass in EASC2402 Field methods or EASC3402 Petrology  Y 1st sem Examination  Y  A+ to F  A Demonstrate thorough understanding at an advanced level of extensive knowledge and attaining all the course learning outcomes. Show strong analytical and critical abilities and logic original thoughts, excellent field observation and ability to solve problems. Highly effect  B Demonstrate substantial understanding at an advanced level of extensive knowledge and attaining all the course learning outcomes. Show analytical and critical abilities and logic original thoughts and abilities of field observation. Effective organization and presentation skills.  B Demonstrate partial but limited understanding for attaining some of the course learning outcomes with a problems. Apply limited or barely effective organization and presentations skills.  D Demonstrate partial but limited understanding for attaining some of the course learning outcomes. Show analytical and critical abilities. Show problems. Poor organization and presentati		

EASC3413 Engineering ge	ology (6 cr	edits)		Academic Year	2014	
Offering Department	Earth Scie	nces		Quota	40	
Course Co-ordinator	Prof J J Jia	ao, Earth Sciences <i>(jjiao</i> @hku.hk)				
Teachers Involved		ao, Earth Sciences one, Earth Sciences				
Course Objectives		o present some of the concepts and skills of importance in the profession of Engineering Geology and lustrate their use by case histories.				
Course Contents & Topics	and skills	n to engineering design and the role o (air photo interpretation, soil and rocl Indations. Case histories from Hong Kor	k description, engi			
Course Learning Outcomes	On succes	On successful completion of this course, students should be able to:				
	engineerin  2. Make s survey and 3. Carry classificati 4. Underst 5. Carry o method.	ate how civil engineering design is ca g projects, particularly the economic- ar imple engineering-geological models a ground investigation design should be out simple air photo interpretation to on for engineering purposes. and major types of slope failures and ba ut stability analyses using methods su	nd safety-critical dut and understand ho carried out. asks and element asic methods to con ch as the limit equ	ies. ow desk study, site ary soil and rock itrol and mitigate lan	e reconnaissance description and adslides.	
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in EA	SC3410 Hydrogeology, or already enro	lled in this course			
Offer in 2014 - 2015	Y 2nd	sem		Examination	May	
Offer in 2015 - 2016	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 and skills to solve a wide range of complex, familiar and unfamiliar practical problems. 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 and skills to solve familiar and some unfamiliar practical problems. 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 and skills to solve most familiar, but not unfamiliar, practical problems. 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 and skills to solve familiar practical problems. Apply limited or barely effective organizational and presentational skills.				
	Fail	Demonstrate little or no evidence of comman outcomes. Lack of analytical and critical abilitie knowledge and skills to practical problems. ineffective.	es, logical and coherent	thinking. Show very little	or no ability to apply	
Course Type	Lecture wi	th laboratory component course				
Course Teaching & Learning Activities	Activities		Details		No. of Hours	
	Lectures				24	
	Laborator	у			20	
	Field worl	(	half day field trip		5	
	Reading /	Self study			90	
Assessment Methods and Weighting	Methods		Details		Veighting in final course grade (%)	
	Assignme	nts	including field repo	ort	30	
	Examinat	on			70	
Required/recommended reading and online materials	Goodman	R. E.: Engineering Geology (Wiley, 199	93)			

EASC3414 Soil and roc	Academic Year	2014			
Offering Department	Earth Sciences	Quota	40		
Course Co-ordinator	Prof J J Jiao, Earth Sciences (jjiao @hku.hk)	Prof J J Jiao, Earth Sciences (jjiao @hku.hk)			
Teachers Involved	Prof J J Jiao, Earth Sciences				

	Dr Yanron	g Li, Geotechnical Company				
Course Objectives		To provide a basic knowledge of soil and rock mechanics for those wishing to consider further studies on a career in engineering geology/geotechnics.				
Course Contents & Topics	stress; str	Stress and strain; properties and classifications of soil and rock; clay minerals; pore pressure and effective stress; strength and failure criteria, initial stresses and their measurement; deformation; consolidation; planes of weakness in rocks; ground treatment methods.				
Course Learning Outcomes	Undersi criteria.     Undersi	On successful completion of this course, students should be able to:  1. Understand basic concepts of stress and strain, pore pressure and effective stress, strength and failure criteria.  2. Understand basic properties and classifications of soil and rock.  3. Appreciate the process of rock deformation and soil consolidation.				
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in E	ASC3410 Hydrogeology, or already enr	rolled in this course			
Offer in 2014 - 2015	Y 2nd	sem		Examination	May	
Offer in 2015 - 2016	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. Apply highly organizational and presentational skills.					
	В	Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking. Apply effective organizational and presentational skills.				
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking. Apply moderately effective organizational and presentational skills.				
	D	Demonstrate partial but limited command of k outcomes. Show evidence of some coheren Apply limited or barely effective organizationa	it and logical thinking, b	ut with limited analytic		
	Fail	Demonstrate little or no evidence of comma outcomes. Lack of analytical and critical ab skills are minimally effective or ineffective.				
Course Type	Lecture wi	ith laboratory component course				
Course Teaching	Activities	3	Details		No. of Hours	
& Learning Activities	Lectures				24	
	Laborato	ry			24	
	Reading /	/ Self study			100	
Assessment Methods and Weighting	Methods		Details		Weighting in final course grade (%)	
	Assignme	ents			30	
	Examinat	ion			70	
Required/recommended reading and online materials		g: Soil Mechanics (Chapman & Hall, 6th dman: Introduction to Rock Mechanics		, 1989)		

EASC3415 Meteorology (6 credits)  Offering Department  Earth Sciences  Quota				
Offering Department	Earth Sciences			
Course Co-ordinator	Dr Z H Liu, Earth Sciences (zhliu@hku.hk)			
Teachers Involved	Dr Z H Liu, Earth Sciences Dr M H Lee, Earth Sciences			
Course Objectives	This course provides students with a modern understanding of weather the processes that govern atmospheric structure and behavior, weather			
Course Contents & Topics	Energy budget, radiative forcing, and greenhouse effect; stability, corstate and pressure; thermodynamic diagrams; weather charts; For Monsoons, air masses, and fronts; thunderstorms, mid-latitude cyclequations of the atmosphere; weather forecasting.	ces, winds, and ge	neral circulation;	
Course Learning Outcomes	On successful completion of this course, students should be able to:  1. Describe key aspects of weather phenomena.  2. Explain essential elements of atmospheric processes governing we  3. Apply physical principles to construct models for some basic aspect  4. Explain synoptic charts (weather maps).  5. Interpret Hong Kong weather (typhoons etc.).			
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in EASC2404 Introduction to atmosphere and hydrosphere			
Offer in 2014 - 2015	Y 1st sem	Examination	Dec	

Offer in 2015 - 2016	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. Demonstrate critical use of data and results to draw appropriate and insightful conclusions. Show insightful use and critical analysis / evaluation of information drawn from a full range of high quality sources and to quote/reference aptly.				
	В	Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Demonstrate correct use of data and results to draw appropriate conclusions. Show critical use of relevant information from sources and ability to make meaningful comparisons between different secondary interpretations and to quote/reference aptly.				
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Demonstrate mostly correct but some erroneous use of data and results to draw appropriate conclusions. Show use of relevant information from sources and ability to make comparisons between different interpretations and to quote/reference aptly.				
	D	outcomes. Show evidence of some coherent Show limited ability to apply knowledge to s	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			
	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. Demonstrate misuse of data and results and/or unable to conclusions. Show limited use of secondary sources and no critical comparison of them.					
Course Type	Lecture-b	pased course				
Course Teaching	Activities		Details	No. of Hours		
& Learning Activities	Lectures			36		
	Project v	work		36		
	Tutorials			12		
	Reading	/ Self study		48		
Assessment Methods and Weighting	Method	s	Details	Weighting in final course grade (%)		
	Assignm	nents		25		
	Examina	ation	2-hour written exam	50		
	Project i	report		25		
Required/recommended reading and online materials	(Brooks/0	ld Ahrens, Meteorology Today, An In Cole, 2013). s. Stull, Meteorology for Scientists and E	•	ate and the Environment		

EASC3416 Advanced geod	hemistry and ge	ochronology (6 credits)		Academic Year	2014
Offering Department	Earth Sciences			Quota	50
Course Co-ordinator	Prof M F Zhou, Ea	rth Sciences (mfzhou@hku.hk)		<u>'</u>	
Teachers Involved	Prof M F Zhou, Ea Dr S H Li, Earth S Prof M Sun, Earth	ciences			
Course Objectives		concepts of modern geochemism Earth science problems.	try and geoch	ronology and thei	r application to
Course Contents & Topics	Zircon U-Pb iso     Principles and t     Introduction to 0	liogenic isotopic dating and modern topic dating and its application echniques for dating mineral deposi Quaternary geochronology opment and applications of Lumines	ts		
Course Learning Outcomes	<ul><li>-demonstrate know</li><li>-explain principles</li><li>- understand how</li></ul>	npletion of this course, students show wedge of concepts and ideas of mo of radiogenic isotopic dating modern analytical techniques are ap geochemical methods are applied	dern geochemis	earth materials	nvironmental ar
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in EASC240 Mineralogy	1 Fluid/solid interactions in earth pr	rocesses or EAS	SC2406 Geochemis	stry or EASC24
Offer in 2014 - 2015	Y 2nd sem			Examination	May
Offer in 2015 - 2016	N				
Course Grade	A+ to F				
Grade Descriptors	attainir eviden and at	t demonstrates thorough mastery at an a g all course learning outcomes. Shows s se of original thought, and the ability to apply the same, can combine fundamental known, s, fluids and gases and how these processes.	trong analytical and his/her knowledge wledge in geochem	d critical abilities and to a wide range of problemstry to understand the	logical thinking, wit ems in geochemistre interactions amon

		global scale. Student shows the ability to apply highly effor	ective organizat-ional and present	ational skills.
	В	Student demonstrates substantial command of a broad most of the course learning outcomes. Show evidence apply his/her knowledge to a range of problems in geochemistry to understand material fluxes among mine global scale. Student shows the ability to apply effective or strain	of analytical and critical abilities geochemistry, and at the same als, fluids and gases over geolog	and logical thinking, and e combine knowledge in ical time periods and on a
	С	Student demonstrates general but incomplete command course learning outcomes. Show evidence of some anal apply his/her knowledge to a range of problems in georgases impact material fluxes on a global scale. Student s and presentational skills.	ytical and critical abilities and log themistry and how interactions at	ical thinking, and ability to mong minerals, fluids and
	D	Student demonstrates partial but limited command of knilearning outcomes. Show evidence of some coherent abilities. Show limited ability to understand key topic knowledge to geological phenomena. Student shows the presentational skills.	and logical thinking, but with limits in geochemistry and limited of	ited analytical and critical capability to transfer this
	Fail	Student demonstrates little or no evidence of command learning outcomes. Lack of analytical and critical abilities to apply knowledge to understand basic topics related to geological problems. Organization and presentational ski	, logical and coherent thinking. She the geochemistry and the applications	nows very little or no ability ation of these principles to
Course Type	Lecture w	h laboratory component course		
Course Teaching & Learning Activities	Activities	Details		No. of Hours
& Learning Activities	Lectures			24
	Laborato	Up to 2	4 hours	24
	Discussion	up to 2	4 hours	12
Assessment Methods and Weighting	Methods	Details		Weighting in final course grade (%)
	Examinat	on One 2-	nour written examination	40
	Test		work assessments: 2 ns, and student seminars	60
Required/recommended reading and online materials	Geochem	stry by William M. White (Wuley, Apr 1, 2013)		

EASC3999 Directed stu	dies in eart	h sciences (6 credits)	Academic Year	2014		
Offering Department	Earth Scien	nces	Quota			
Course Co-ordinator	Prof M Sun	, Earth Sciences (minsun@hku.hk)				
Teachers Involved						
Course Objectives	To enhanc thinking ski	e the student's knowledge of a particular topic and the st lls.	udent's self-directed le	earning and critica		
Course Contents & Topics	member. T	be the control of a state of the topic in earth sciences under the supervision of a state of the topic is preferably one not sufficiently covered in the regular curriculum. The directed study call a critical review or a synthesis of published work on the subject, or a laboratory or field study that would shance the student's understanding of the subject. The project may not require an element of originality.				
Course Learning Outcomes	Enhanc research in	sful completion of this course, students should be able to:  e the ability in self-learning, data-collection and analyse earth sciences.  entific dissertation, and conduct oral presentation of the reserved.		doing independen		
Pre-requisites	Pass in at I	east 24 credits of advanced level earth sciences courses (I	EASC3XXX or EASC4	XXX); and		
(and Co-requisites and Impermissible	Cumulative	GPA of 2.5 or above.				
(and Co-requisites and Impermissible combination)		GPA of 2.5 or above.	Examination	No Exam		
(and Co-requisites and Impermissible combination) Offer in 2014 - 2015			Examination	No Exam		
(and Co-requisites and Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade	Y Year		Examination	No Exam		
(and Co-requisites and Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade	Y Year		critical abilities and logical formation drawn from a fu o draw insightful conclusion of A+ should show conside	thinking, with evidence Il range of high quality is and solve problems		
(and Co-requisites and Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade	Y Year Y A+ to F	Demonstrate thorough grasp of the subject. Show strong analytical and of original thought. Insightful use and critical analysis / evaluation of it sources and to quote/reference aptly. Critical use of data and results the Apply highly effective organizational and presentational skills. [Work or source or	l critical abilities and logical nformation drawn from a fu o draw insightful conclusion of A+ should show conside the topic.] In discription of the critical abilities and logic ingful comparisons betwee results to draw appropriate.	thinking, with evidence Il range of high quality as and solve problems rable creative thinking al thinking. Critical use an different secondary		
(and Co-requisites and Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016	Y Year Y A+ to F	Demonstrate thorough grasp of the subject. Show strong analytical and of original thought. Insightful use and critical analysis / evaluation of in sources and to quote/reference aptly. Critical use of data and results the Apply highly effective organizational and presentational skills. [Work of and additional work beyond that is required in wider areas relevant to the Demonstrate substantial grasp of the subject. Evidence of analytical and of relevant information from sources, showing ability to make mean interpretations and to quote/reference aptly. Correct use of data of	I critical abilities and logical formation drawn from a fu or drawn from a fu or drawn from a fu or drawn from a fu or fa + should show conside the topic.]  Indicate the critical abilities and logic ingful comparisons between results to draw appropriate all and presentational skills.  If some analytical and criticals comparisons between	thinking, with evidence II range of high quality is and solve problems rable creative thinking at thinking. Critical use an different secondary econclusions to draw call abilities and logica different interpretations.		

	Fail	analytical and critical abilities, logic	o grasp of the knowledge and understanding of the subject cal and coherent thinking. Limited use of secondary sources s and/or unable to draw appropriate conclusions. Organizate.	es and no critical comparison
Course Type	Project-b	pased course		
Course Teaching & Learning Activities	Activities		Details	No. of Hours
a Learning Activities	Reading	g / Self study	the student is expected to spen at least 120 hours on the project	
Assessment Methods and Weighting	Method	ls	Details	Weighting in final course grade (%)
	Resear	ch report		100

EASC4403 Biogeochemica	al cycles (6	credits)	Academic Y	ear 2014		
Offering Department	Earth Scie	ences	Quota			
Course Co-ordinator	Dr Y Li, E	arth Sciences (yiliang@hku.hk)				
Teachers Involved	Dr Y Li, E	arth Sciences				
Course Objectives	geosphere life. Huma	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	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	Describ     Illustrate     Draw co     to biogeod	esful completion of this course, student te the major geochemical cycles on Ear the interactions between the geocher onnections between changes to the Ea chemical cycles.	rth. nical cycles and the main environments rth systems and the cause/effect rel	ationships of changes		
Pre-requisites (and Co-requisites and Impermissible combination)		Pass in ENVS3313 Environmental oceanography or EASC3403 Sedimentary environments or EASC347 Advanced geochemistry and geochronology				
Offer in 2014 - 2015	N		Examination	ı		
Offer in 2015 - 2016	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 activities and logical thinking.				
	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcome. Show evidence of analytical and critical abilities and logical thinking.					
	C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Apply moderately effective organizational and presentational skills. Show interest in the taught topics, and to answer most questions correctly.					
	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. She limited ability to apply knowledge to solve problems. Show some interest in the taught topics. Able to answer more than half of question correctly.					
	Fail	Demonstrate little or no evidence of comma outcomes. Lack of analytical and critical abili knowledge to solve problems. Does not show	ties, logical and coherent thinking. Show very	little or no ability to apply		
Course Type	Lecture-ba	ased course				
Course Teaching	Activities	S	Details	No. of Hours		
& Learning Activities	Lectures			28		
	Tutorials			14		
	Group wo	ork	PBL group work	14		
	Project w	ork	Writing course thesis	30		
	Reading	/ Self study		54		
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)		
	Essay			60		

	Examination	40
Required/recommended reading and online materials	Biogeochemistry: An Analysis of Global Change, Fundamentals of Geobiology, edited by Andrew H	

EASC4406 Earth dynamic	s (o creaits		Academic Year	2014		
Offering Department	Earth Scie	nces	Quota			
Course Co-ordinator	Prof G Zha	o, Earth Sciences (gzhao@hku.hk)				
Teachers Involved		o, Earth Sciences Earth Sciences				
Course Objectives	This cours and the glo	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 processes 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	- Plate tect - Mantle cc - Energy a - Methods - Structure - Isostasy; - Sea floor - Subducti - Formatio - Continen - Sedimen	<ul> <li>Earth as a heat engine; Earth's interior; major features of the continents and oceans;</li> <li>Plate tectonics; orogenesis; crustal growth.</li> <li>Mantle convection; hot spots and plumes;</li> <li>Energy and driving forces of Earth processes;</li> <li>Methods of investigation of large scale structures and processes;</li> <li>Structure and physical properties of the planet;</li> <li>Isostasy; continental drift;</li> <li>Sea floor spreading; ocean ridges; transform faults;</li> <li>Subduction zones; mountain belts and orogenesis;</li> <li>Formation of continental crust;</li> <li>Continental rifts and continental margins;</li> <li>Sedimentary basins;</li> <li>Mechanism, consequence and implication of plate tectonics.</li> </ul>				
Course Learning Outcomes	On succes	sful completion of this course, students should	d be able to:			
Pre-requisites (and Co-requisites and	2. Underst 3. Appreci processes 4. Distill of 5. Produce	appreciation of the Earth as a dynamic plane and how energy release within the Earth is tra ate the importance of a knowledge of the a wide range of data to differentiate competing concise written and oral summaries of literature EASC3403 Sedimentary environments or s or EASC3409 Igneous and metamorphic pe	inslated into geological process history of investigation of glo g geological theories. ure research on specific topics EASC3404 Structural geolog	bbal scale tectonic in global dynamics.		
Impermissible combination)						
Offer in 2014 - 2015	-	sem	Examination	May		
Offer in 2015 - 2016	Y					
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 course outcomes, have an in-depth grasp of the subject, and provide evidence of strong analytical and logical thinking, where possible with original thought. Show outstanding and effective organizational and presentation skills, and the insightful use of data, literature reviews and other sources to undertake a high level of critical analysis and draw appropriate conclusions. Be able to integrate the full range of appropriate theories, principles, and evidence.				
	В	B The student should show a substantial knowledge of a significant range of the skills necessary for attaining most, if not all, of the course outcomes, and have a substantial grasp of the subject. Show evidence of the ability to think critically and to have effective organizational and presentational skills and make critical use of relevant information from different sources, showing the ability to make comparisons between consequent interpretations. Be capable of the general integration of theories, principles and evidence.				
	С	The student should have a general command of the knowledge, competencies and skills required for attaining the majority of the course outcomes, and a general grasp of the subject. Show some evidence of critical ability and logical thinking and moderately effective organizational and presentational skills. The student should be moderately effective in the use of data to draw appropriate conclusions, should be able to use relevant information from sources and able to make comparisons between different interpretations, through partial integration of theories, principles and evidence.				
	D	The student should have a partial but limited command of the knowledge, competencies and skills necessary fattaining a number of the course learning outcomes, and a limited grasp of the subject. Show evidence of son analytical competence and critical thinking and at least marginally effective organizational and presentational skil Have limited ability to use data and results to draw appropriate conclusions and use and reference a variety sources mainly in summary rather than through analysis and comparison.				
	Fail	The student shows little or no evidence of knowledge learning outcomes, lacks an overall grasp of the su thinking abilities. Shows little ability to a apply kn presentation and/or organizational skills. Shows little e	bject area and shows an absence of owledge to solve problems and has	f analytical and critical poor and ineffective		
Course Type	Lecture-ba	sed course				
Course Teaching	Activities	Detai	Is	No. of Hours		
& Learning Activities	Lectures			36		
	Tutorials	stude	nt seminars and exercises	12		
	Reading /	Self study essay additi	, presentation plus onal reading	100		

			course grade (%)
	Assignments		20
	Essay	Including essays and seminars	50
	Examination		30
Required/recommended reading and online materials	Kearey, P and Vine, F.J. Global tectonics (Oxfor Turcotte, D and Schubert, G. Geodynamics (Car Davies, Geoffrey F., Mantle convection for geological description).	mbridge Univ Press, 2002, 2nd ed.)	

EASC4407 Regional ged	ology (6	credits)		Academic Year	2014			
Offering Department	Earth Sc	ciences		Quota	40			
Course Co-ordinator	Dr J R A	Dr J R Ali, Earth Sciences (jrali@hku.hk)						
Teachers Involved		Dr J R Ali, Earth Sciences Prof G Zhao, Earth Sciences						
Course Objectives		nine the key events and phenomen g that of Hong Kong.	a associated with the tectoni	c evolution of Eas	t-SE-South Asia,			
Course Contents & Topics	of HK: ig collision evolution Paleopro igneous	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: India-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. mantle plumes; Paleoproterozoic amalgamation of the North China Craton; Late Mesoproterozoic to early Neoproterozoic 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 succ	essful completion of this course, stud	dents should be able to:					
	evolution 2. Have explain I last 250 3. Carry literature	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.  2. Have an awareness of the influential (and in some cases conflicting) models that have been proposed the 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.  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 combination)		Pass in EASC3403 Sedimentary environments or EASC3404 Structural geology or EASC3409 Igneous an metamorphic petrogenesis						
Offer in 2014 - 2015	Y 19	st sem		Examination	Dec			
Offer in 2015 - 2016	Υ							
Course Grade	A+ to F							
Grade Descriptors	A	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.							
	C 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 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.						
	Fail  Little or no grasp of the knowledge and understanding of the subject; little or no evidence of critical abilities and logical / coherent thinking; incoherent organization and poor presentational skills; limited use of secondary sources and no critical comparison of them.							
Course Type	Lecture	with laboratory component course						
Course Teaching & Learning Activities	Activiti	es	Details		No. of Hours			
a Learning Activities	Lecture	S			28			
	Laboratory guided litera			veys	20			
	Reading	g / Self study			80			
Assessment Methods and Weighting	Method	als	Details		/eighting in final course grade (%)			
5 5	Assignments				FC			
	Examination				50			

Offering Dengetment Farth Sciences Oueta	EASC4408 Special topics in	Academic Year	2014	
Offering Department Latti Sciences audita	Offering Department Earth Sciences		Quota	

Required/recommended reading and online materials	ТВА						
Assessment Methods and Weighting	Methods	5	Deta	ils			Weighting in final course grade (%)
Course Teaching & Learning Activities	Activitie	s		Details			No. of Hours
Course Type	Lecture w	ith laboratory comp	onent	course			
	Fail						
	D						
	С						
	В						
Grade Descriptors	Α						
Course Grade	A+ to F						
Offer in 2015 - 2016	Υ						
Offer in 2014 - 2015	N					Examination	
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in a	ass in any EASC3XXX or EASC4XXX course					
Course Learning Outcomes	TBC						
Course Contents & Topics	TBC						
Course Objectives	TBC						
Teachers Involved	TBC, Ear	FBC, Earth Sciences					
Course Co-ordinator	TBC, Ear	TBC, Earth Sciences ()					

EASC4911 Earth system:	contempora	ry issues (6 credits)	Academic Year	2014
Offering Department	Earth Scien	nces	Quota	
Course Co-ordinator	TBC, Earth	Sciences ()		
Teachers Involved	TBC, Earth	Sciences		
Course Objectives	the knowle appreciatio the global	one experience, this course provides students with a dge gained in previous courses in Earth System S n and awareness of the Earth System, the interplay lissues facing Earth scientists, such as changes in and preservation of the planet.	Science, in order to gain a between its component pa	a more in-dept rts, and some
Course Contents & Topics		as an integrated system; the interactions between Earth's climate; feedback mechanisms; natural resource		ne evolution ar
Course Learning Outcomes	1. Compreh 2. Understa 3. Synthesi particularly	sful completion of this course, students should be able mend in some depth the nature of the issues confronti and the basis of interrelationships through feedback to ize scientific data available from a variety of source in areas of contemporary concern. and how past and present activities on the planet will	ng humankind as part of the pops within the Earth Systems and apply the data to p	em.
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in at EASC4XXX	least 24 credits of advanced level compulsory/core (x) in the Earth System Science Major including at lea gy or EASC3415 Meteorology or ENVS3313 Environme course is for Earth System Science Major student	e earth sciences courses st two of the following coul mental oceanography.	(EASC3XXX orses: EASC341
Offer in 2014 - 2015	N		Examination	
Offer in 2015 - 2016	Υ			
Course Grade	A+ to F			
Grade Descriptors	A	Demonstrate thorough mastery at an advanced level of extensi the course learning outcomes. Show strong analytical and cri original thought, and ability to synthesize and apply knowledge	tical abilities and logical thinking	g, with evidence on hiliar and unfamilia
		situations. Demonstrate critical use of data, literature reviews, a conclusions. Apply highly effective organizational and presentation		oriate and insightfo
	В		onal skills.  dge and skills required for attainid critical abilities and logical thir niliar situations. Demonstrate co	ing at least most on the least most of the least
	С	conclusions. Apply highly effective organizational and presentation Demonstrate substantial command of a broad range of knowled the course learning outcomes. Show evidence of analytical an synthesize and apply knowledge to familiar and some unfamiliterature reviews, and other sources to draw appropriate	onal skills.  dge and skills required for attainid critical abilities and logical thir niliar situations. Demonstrate occonclusions. Apply effective cand skills required for attaining pritical abilities and logical think monstrate mostly correct but som	ng at least most of a least most of the course ing, and ability to most of the course ing, and ability to be erroneous use of

	Show limited ability to synthesize and apply knowledge to solve problems. Demonstrate limited ability to use literature reviews, and other sources to draw appropriate conclusions. Apply limited or barely effective organ						
	outcor synthe source	Fail  Demonstrate little or no evidence of command of knowledge and skills require outcomes. Lack of analytical and critical abilities, logical and coherent thinking synthesize and apply knowledge to solve problems. Demonstrate misuse of a sources and/or unable to draw appropriate conclusions. Organization and present or ineffective.					
Course Type	Laboratory and w	orkshop course					
Course Teaching & Learning Activities	Activities		Detail	s	No. of Hours		
& Learning Activities	Lecture				8		
	Project work				40		
	Tutorials				20		
	Reading / Self study				60		
Assessment Methods and Weighting	Methods		Detail	s	Weighting in final course grade (%)		
	Laboratory reports		progre	ess reports	20		
	Presentation				20		
	Project reports				30		
	Test		oral preser	examination (on ntation)	30		
Required/recommended reading and online materials	TBC						

EASC4955 Integrated f	ield studi	ies (6 credi	ts)		Academic Year	2014		
Offering Department	Earth Sc	Earth Sciences			Quota			
Course Co-ordinator	Dr J King	Dr J King, Earth Sciences (jessking@hku.hk)						
Teachers Involved	Dr J King	g, Earth Scie	nces					
Course Objectives	techniqu	ues and 2) of rseas locality	gical field camp are to provide portunities to study at first-ha . The course requires integ	and areas of particula	r geological interes	t and importance of		
Course Contents & Topics	Geologic rocks an	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:  Geological setting and stratigraphy, tectonic evolution structural geology, petrography and petrogenesis of ocks and minerals, economic deposits and geomorphology of the area.  Students will undertake field mapping of an area in small groups.						
Course Learning Outcomes		On successful completion of this course, students should be able to:  1. Synthesize geological information pertaining to an area and derive a model of tectonic evolution.						
Pre-requisites (and Co-requisites and Impermissible combination)	EASC4X geology,	XXX) in the , EASC3409	credits of advanced level Geology Major including EA Igneous and metamorphic pe is for Geology Major student	SC3403 Sédimentary trogenesis.				
Offer in 2014 - 2015	Y 2r	nd sem			Examination	No Exam		
Offer in 2015 - 2016	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. 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.							
	В	Demonstrate substantial grasp of the subject. Evidence of analytical and critical abilities and logical thinking. Apply effective fieldwork skills and techniques. Correct use of data of results to draw appropriate conclusions. Apply effective organizational and presentational skills.						
	Demonstrate general but incomplete grasp of the subject. Evidence of some analytical and critical abilities and logical thinking. Apply moderately effective fieldwork skills and techniques. Mostly correct but some erroneous use of data and results to draw appropriate conclusions. Apply moderately effective organizational and presentational skills.							
	D 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 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	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. 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.						
Course Type	Field car	mps						

& Learning Activities	Activities	Details	No. of Hours
	Lectures	3 sessions x 1 hour	3
	Field work		48
	Reading / Self study		100
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)
	Report		100

EASC4966 Earth sciences	internship	o (6 credits)		Academic Year	2014		
Offering Department	Earth Scien	nces		Quota			
Course Co-ordinator	Dr P Y Tam	Dr P Y Tam, Earth Sciences (ttpy2002@hku.hk)					
Teachers Involved	Dr P Y Tan	n, Earth Sciences					
Course Objectives	major of stu knowledge	e aims to offer students the opportunitie udy. The workplace learning experience gained in the study to the real work env work either within the University or outsion	e would be of great rironments. Students	benefits to the stude have to take on a	dents to apply their t least 160 hours of		
Course Contents & Topics	or various t (2) Outside student will member of	1) Within the university: The student will be supervised by a staff member (Supervisor), working on a project or various tasks as instructed by the Supervisor.  2) Outside the university: The student will work in an external agency related to the major of study. The student will be supervised under a staff member of the external agency (the External Supervisor) and a staff nember of the Department/School of the student (the Internal Supervisor). The work to be performed by the student will normally be instructed by the External Supervisor, with prior agreement of the Internal Supervisor.					
Course Learning Outcomes	Gain at le     Acquire a	On successful completion of this course, students should be able to:  1. Gain at least 4 weeks of work experience in a geosciences-related firm or the Government.  2. Acquire an understanding and appreciation of the real work environment.  3. Have some experience with applying learned knowledge to solving real world problems.					
Pre-requisites (and Co-requisites and Impermissible combination)	Students at	Pass in at least 24 credits of advanced level earth sciences courses (EASC3XXX or EASC4XXX). Students are expected to have satisfactorily completed their Year 3 study. This course is not a capstone course and students cannot use this course to fulfill the capstone requirem of the Earth System Science and Geology Majors.					
Offer in 2014 - 2015	Y 2nd	sem Summer		Examination	No Exam		
Offer in 2015 - 2016	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  Very limited or no ability to solve problems in the workplace. Fails to handle or carry out the work required in the job or assigned by supervisor(s). Fails to establish effective collaboration or communication with supervisor(s), other colleagues, or clients in the job. Fails to satisfy the requirements set out in the Course Description regarding working hours, written and oral report, or evaluation by supervisor(s), etc.						
Course Type	Internship						
Course Teaching	Activities		Details		No. of Hours		
& Learning Activities	Internship	work	it is expected that students are to work at least 160 hours (or the equivalent of 4 weeks full-time)		160		
Assessment Methods and Weighting	Methods		Details		Weighting in final course grade (%)		
	Written report		written report, feedback and oral	employer's presentation	100		
Additional Course Information	those who This course this course Enrolment through th	Students are expected to have satisfactorily completed their Year 3 study. Special consideration be given to those who have completed Year 2.  This course will be assessed on "Pass, Fail and Distinction" basis. Students who are interested to enrol in this course should contact the Department to obtain the approval.  Enrolment of this course is not conducted via the online course selection system and should be made through the relevant Department/School office after approval has been obtained from the course coordinator.					

EASC4999 Earth scie	Academic Year	2014		
Offering Department	Earth Sciences Quota			
Course Co-ordinator	Prof M Sun, Earth Sciences (minsun@hku.hk)			
Teachers Involved	TBC, Earth Sciences			

Course Objectives		To enhance the student's knowledge, ability and interest in advanced studies in the Earth Sciences by providing the student with an opportunity to be engaged in an advanced research project.					
Course Contents & Topics	member. and designole in the	The student undertakes a research project in the form of a senior thesis under the supervision of a staff member. The project could be based on a particular component of a staff member's research or one proposed and designed by the student. The student must involve in the project in a non-trivial manner, and play a major role in the project formulation, data collection and analysis, and presentation. The project should contain an element of originality.					
Course Learning Outcomes	<ol> <li>Acquire</li> <li>Independ</li> <li>Select</li> <li>thinking.</li> </ol>	On successful completion of this course, students should be able to:  1. Acquire first-hand research experience in earth sciences by doing an individual research project ndependently under the supervision of a supervisor.  2. Select research topics, design research path, choose research technology, and more importantly use critical thinking.  3. Enhance the ability in doing independent earth/environmental research with field/laboratory components.					
Pre-requisites (and Co-requisites and Impermissible combination)		least 24 credits of advanced level ear re GPA of 2.7 or above.	th sciences courses (EASC	3XXX or EASC4>	(XX); and		
Offer in 2014 - 2015	N	Examination					
Offer in 2015 - 2016	Υ						
Course Grade	A+ to F	A+ to F					
Grade Descriptors	A	A Demonstrate thorough grasp of the subject. Show strong analytical and critical abilities and creative thinking, with evidence of original thought. Insightful use and critical analysis / evaluation of information drawn from a full range of high quality sources and to quote/reference aptly. Critical use of first-hand data and results to draw insightful conclusions and solve problems. Apply highly effective organizational and presentational skills. [Work of A+ should show considerable creative thinking and additional work beyond that is required in wider areas relevant to the topic.]					
	В	B Demonstrate substantial grasp of the subject. Evidence of analytical and critical abilities and creative thinking. Critical use of relevant information from sources, showing ability to make meaningful comparisons between different secondary interpretations and to quote/reference aptly. Correct use of first-hand data of results to draw appropriate conclusions to draw insightful conclusions and solve problems. Apply effective organizational and presentational skills.					
	C Demonstrate general but incomplete grasp of the subject. Evidence of some analytical and critical abilities and creative 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 first-hand 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 first-hand data and results to draw appropriate conclusions. Apply limited or barely effective organizational and presentational skills.						
	Fail	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-ba	ased course					
Course Teaching	Activitie	s	Details		No. of Hours		
& Learning Activities	Reading / Self study		the student is expec	ted to spend			
& Learning Activities	Reading	/ Self study	at least 240 hours or		240		
& Learning Activities  Assessment Methods and Weighting	Reading	,		the project	240 Veighting in final course grade (%)		

<b>ENVS1401 Introduction to</b>	Academic Year	2014						
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	To provide students with an inter-disciplinary introduction to Environmental Science with key questions to highlight the interconnections between biological, geological and chemical processes.  To convey the basic science behind environmental interactions and place it within the context of human impacts and dependence on the natural world.  To better understand how humans interact, manage and sustain the environment within the context of our economies, governments and individual choices.							
Course Contents & Topics	The teaching and learning will be organized around key issues: application of science to solve environmental problems; human population growth as the underlying environmental problem; ways to restore damaged ecosystems; the appropriate use and misuse of forest and wildlife; the problems in feeding the world without destroying the environment; the difficulty in assuring a sustainable supply of energy; ways to maintain water resources for future generations; our contribution to global climate change problem of air pollution in cities; waste management; the reasons for natural hazards becoming disasters and catastrophes; prices on scenic beauty; ways to plans, and achieve, a sustainable environment.							
Course Learning Outcomes	On successful completion of this course, students should be a 1. Explain and describe connections between the physical discuss the impact of human society on the environment. 2. Explain the concept of environmental sustainability, give exachieve sustainability. 3. Compare different approaches to resolving specific problem.	and biological stresses in camples of how society can						

Pre-requisites (and Co-requisites and Impermissible combination)	NIL					
Offer in 2014 - 2015	Y 1st	sem		Examination	Dec	
Offer in 2015 - 2016	Υ					
Course Grade	A+ to F					
Grade Descriptors	A Demonstrate thorough understanding of the subject and an ability to apply knowledge gained in class to a wide range of complex, familiar and unfamiliar situations. Show evidence of logical thinking and some original thought. Coursework completed on time and to a high academic standard.					
	В	Demonstrate a good understanding of the su situations. Show evidence of logical thinking standard.				
	С	Demonstrate general but incomplete understanding of the subject and an ability to apply knowledge to most familiar situations. Show some evidence of logical thinking, but with some inconsistencies. Some coursework incomplete, but submitted on time and in an adequate academic standard.				
	D	Demonstrate partial but limited grasp of the subject and a limited ability to apply knowledge to some familiar situations. Show only able to apply knowledge to simple examples. Show little evidence of logical thinking. Coursework submitted late to a poor standard.				
	Fail  Demonstrate little or no understanding of the subject and very little or no ability to apply knowledge to familiar situations. Show no evidence of logical or coherent thinking. Coursework missing or substandard.					
Course Type	Lecture-ba	ased course				
Course Teaching	Activities		Details		No. of Hours	
& Learning Activities	Lectures				24	
	Tutorials		group discussion debate	and class	24	
	Field work		a one-day field trip		8	
	Reading / Self study			112		
Assessment Methods and Weighting	Methods		Details		Weighting in final course grade (%)	
	Assignme	ents			50	
	Examinat	tion			50	
Required/recommended reading and online materials		ng in the Environment (Thomson, 2007 Botkin: Essential Environmental Scien				

ENVS3004 Environment, s	ociety and	economics (6 credits)	A	cademic Year	2014		
Offering Department	Earth Scie	nces	Q	uota			
Course Co-ordinator	Prof Y Q 2	ong, Earth Sciences (yqzong@hku.hk)					
Teachers Involved	Prof Y Q 2	ong, Earth Sciences					
Course Objectives	rural and pollutants and conc Students	This course follows up issues highlighted in the introductory course and provides in-depth studies abour rural and urban environments for students to examine the problems of resource scarcity and accumulating pollutants which human society is confronted. The course will focus on specific environmental problems and concepts of Environmental Economics for resource management and environmental protection. Students will analyze the nature of key natural resources such as land, air and water, and explore ways to improve resource management, protect the environment and develop sustainable economies.					
Course Contents & Topics	Basic con Resourse Managem	Valuing 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 successful completion of this course, students should be able to:  1. Demonstrate knowledge and critical understanding of the complexity and interconnectedness between human society and the natural environment.  2. Recognise appropriate use and misuse of natural resources, and  3. assess economic solutions and policies for solving environmental problems.						
Pre-requisites (and Co-requisites and Impermissible combination)		HEM2041 Principles of chemistry or EAS0 I Environmental field and lab course or EN					
Offer in 2014 - 2015	Y 2nd	sem	E	xamination	May		
Offer in 2015 - 2016	Υ						
Course Grade	A+ to F						
Grade Descriptors	A Demonstrate thorough mastery of the course material. Show strong ability for analytical, critical and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Demonstrate highly effective organizational and presentational skills.						
	B Demonstrate substantial command of the course material and an ability to apply knowledge to familiar and some unfamiliar situations. Show evidence of analytical, critical thought to some complex issues. Apply effective organizational and presentational skills.						

	С	Demonstrate general but incomplete command of the course material and an ability to apply familiar situations. Show evidence of some critical and logical thinking abilities. Apply m organizational and presentational skills.					
	D	Demonstrate partial but limited command of the course material and a limited ability to apply keep problems. Show evidence of some coherent and logical thinking, but with limited analytical and crillimited or barely effective organizational and presentational skills.					
	Fail		Demonstrate little or no evidence of command of course material with very little or no ability to apply be solve problems. Lack of critical thinking abilities and incoherent thinking. Organization and presentation minimally effective or ineffective.				
Course Type	Lecture-b	ased course					
Course Teaching & Learning Activities	Activitie	s	Details	No. of Hours			
& Learning Activities	Lectures			36			
	Tutorials			12			
	Reading / Self study			100			
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)			
	Essay			50			
	Examination			50			
Required/recommended reading and online materials	Keller and Kaufman	Fietenberg 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		course code: ENVS2004 ory to 4-year students					

ENVS3007 Natural hazards	and ming	ation (6 credits)		Academic Year	2014			
Offering Department	Earth Scie	ences		Quota				
Course Co-ordinator	Prof Y Q Z	Prof Y Q Zong, Earth Sciences (yqzong @hku.hk)						
Teachers Involved	Prof Y Q Z	Zong, Earth Sciences						
Course Objectives	and flood, not entire 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	Geologica Climatic has Preparedr 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 successful completion of this course, students should be able to demonstrate knowledge and critical understanding of the key characteristics of major natural hazards, the human aspects of the hazards, and technologies used to protect lives and properties.							
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in EASC2401 Fluid/solid interactions in earth processes or ENVS2001 Environmental field and lat course or ENVS2002 Environmental data analysis							
Offer in 2014 - 2015	Y 1st	sem		Examination	Dec			
Offer in 2015 - 2016	N							
Course Grade	A+ to F							
Grade Descriptors	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	Demonstrate substantial command of the course material and an ability to apply knowledge to familiar and some unfamiliar situations. Show evidence of analytical, critical thought to some complex issues. Apply effective organizational and presentational skills.						
	С	C Demonstrate general but incomplete command of the course material and an ability to apply knowledge to most familiar situations. Show evidence of some critical and logical thinking abilities. Apply moderately effective organizational and presentational skills.						
	D  Demonstrate partial but limited command of the course material and a limited ability to apply knowledge to solve problems. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Apply limited or barely effective organizational and presentational skills.							
	Fail  Demonstrate little or no evidence of command of course material with very little or no ability to apply knowledge to solve problems. Lack of critical thinking abilities and incoherent thinking. Organization and presentational skills are minimally effective or ineffective.							
Course Type	Lecture-ba	ased course						
Course Teaching	Activities	3	Details		No. of Hours			
& Learning Activities	Lectures							

	Tutorials	Project tutorials	8			
	Discussion	Group discussion	16			
	Reading / Self study		100			
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)			
	Examination		50			
	Project reports		50			
Required/recommended reading and online materials	Smith K.: Environmental Hazards: Assessing Risk and Reducing Disaster (Routledge, 2004) Bryant E.: Natural Hazards (Cambridge University Press, 2005) Hyndman and Hyndman: Natural Hazards and Diasters (Amazon, 2009)					
Additional Course Information	Previous course code: ENVS2007					

ENVS3313 Environmental	oceanogra	aphy (6 credits)		Academic Year	2014		
Offering Department	Earth Scient	ences		Quota			
Course Co-ordinator	Dr S C Cl	nang, Earth Sciences (suchin@hku.hk)					
Teachers Involved	Prof Y Q	nang, Earth Sciences Zong, Earth Sciences aker, School of Biological Sciences					
Course Objectives	highlight conditions To conve	To provide students with a thorough introduction to coastal and ocean processes with key questions to highlight the importance of the (paleo)oceanographic processes to environmental and ecological conditions.  To convey the basic science behind ocean-atmosphere and ocean-biosphere interactions and place it within the context of human's connectedness to the physical world.					
Course Contents & Topics	and their contain 9 properties system in specifical	To provide a solid foundation of knowledge about the physical processes dictating the oceans movements and their impacts on the environment and ecosystems. The oceans take up 71% of earth's surface and contain 98% of the water. By looking at the structure of the atmosphere, thermodynamic principals and properties governing sea water, we will evaluate the critical roles the ocean plays in the environmental system including its influence on (paleo)climate, coastal resources, and nutrient cycling. Case studies specifically examining changes in sea level rise, El Nino, and (paleo)climate will be used to connect oceanographic principles to environmental problems.					
Course Learning Outcomes	Descrik     Identify     transport.     Descrik	On successful completion of this course, students should be able to:  1. Describe the major surface and deep currents of the ocean.  2. Identify and describe important processes in the ocean controlling large scale circulation and nutrien transport.  3. Describe sources and distribution of critical chemicals and sea water properties in the ocean.  4. Illustrate connections between physical ocean processes, climate systems and biological activity.					
Pre-requisites (and Co-requisites and Impermissible combination)		Pass in ENVS2001 Environmental field and lab course or ENVS2002 Environmental data analysis o BIOL2306 Ecology and evolution or EASC2404 Introduction to atmosphere and hydrosphere					
Offer in 2014 - 2015	Y 2nd	sem		Examination	May		
Offer in 2015 - 2016	Υ						
Course Grade	A+ to F						
Grade Descriptors	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining the entire course learning outcomes. Show ability to think logically and critically, with evidence of original thought. Critically evaluate data and results to draw appropriate and insightful conclusions. Apply highly effective organizational and presentational skills.						
	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of 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	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 w	ith laboratory component course					
Course Teaching	Activitie	S	Details		No. of Hour		
& Learning Activities	Lectures		12 sessions x 2 hours		2		
	Laborato	ry	5 labs x 2 hours		1		
	Field wo	·k	1 day field trip				
	Project w	vork	group presentation		1:		
	Reading / Self study						

Assessment Methods and Weighting	Methods Details		Weighting in final course grade (%)		
	Assignments	lab report	20		
	Examination	2 hour written final exam	40		
	Presentation	group presentation	20		
	Test	2 hour mid-term test	20		
Required/recommended reading and online materials	Beer, 1997. Environmental Oceanography: Second Edition. CRC-Press. Abel and McConnell, 2009. Environmental Oceanography: Topics and Analysis. Jones & Bartlett Publishers. Garrison, 2004. Oceanography: An Invitation to Marine Science. 5th edition. Brooks Cole. Cronin, 2009. Paleoclimates: Understanding Climate Change Past and Present. Columbia University Press.				
Additional Course Information		Course will be offered every alternate year starting from 2013-14. Course will be offered every year starting from 2014-2015 and coordinated by DES.			

ENVS3999 Directed stu	ıdies in er	enviro	onmental science (6 credits)		Academic Year	2014			
Offering Department	Earth Sc	Science	es		Quota				
Course Co-ordinator	Dr C Din	C Dingle, Earth Sciences (cdingle@hku.hk)							
Teachers Involved	Dr C Din	C Dingle, Earth Sciences							
Course Objectives			students knowledge on a particular topic in critical thinking skills.	environmental	science and stude	nts self-directed			
Course Contents & Topics	material	tudents undertake extensive reading on a selected topic guided by a staff member. Reading should cover laterial beyond textbooks. Students are required to analyze the material read, formulate their own scientific rgument, and present it in written form.							
Course Learning	On succe	On successful completion of this course, students should be able to:							
Outcomes		omplete a research task independently in one or more topical areas of the major. how competence in formulating their own scientific argument.							
Pre-requisites (and Co-requisites and Impermissible combination)	Major. Cumulat	ative G	st 24 credits of advanced level (level 3 or 4) or 2.5 or above in Environmental Science course is for Environmental Science Major st	Major.	e courses in Enviro	nmental Science			
Offer in 2014 - 2015	N				Examination				
Offer in 2015 - 2016	Y								
Course Grade	A+ to F	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	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.							
	С	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	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-b	-based	course						
Course Teaching	Activitie	Activities Details		nils		No. of Hours			
& Learning Activities	Reading	Reading / Self study		arch work & rep	oort	120			
Assessment Methods and Weighting	Method	ods	Deta	nils		eighting in fina ourse grade (%			
	Oral pre	resenta	ation			10			
	Researc	rob ror	oort			90			

<b>ENVS4999 Environmental</b>	Academic Year	2014				
Offering Department	Quota					
Course Co-ordinator	Prof Y Q Zong, Earth Sciences (yqzong @hku.hk)	Prof Y Q Zong, Earth Sciences (yqzong@hku.hk)				
Teachers Involved Prof Y Zong, Earth Sciences						

Course Objectives	To enhar	To enhance students knowledge and research skills in advanced level of environmental science.					
Course Contents & Topics	a staff melements	Students undertake a research project in the form of an undergraduate dissertation under the supervision of a staff member. The project could be based on one of the four areas covered by the major and must show elements of interdisciplinary nature. The dissertation should show an element of originality and the research in a non-trivial manner.					
Course Learning Outcomes	On succe	essful completion of this course, students	should be able to:				
		ete a dissertation project of undergraduat competence in formulation, data collection					
Pre-requisites (and Co-requisites and Impermissible combination)	Science I and Stud	Pass in at least 24 credits of advanced level (level 3 or 4) compulsory/core courses in Environmental Science Major; and Students must have a cumulative GPA of 3.0 or above in Environmental Science Major. This capstone course is for Environmental Science Major students only.					
Offer in 2014 - 2015	N			Examination			
Offer in 2015 - 2016	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.]						
	<b>B</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-b	ased course					
Course Teaching	Activitie	es	Details		No. of Hours		
& Learning Activities	Reading	/ Self study	research work & rep	ort	240		
Assessment Methods and Weighting	Method	S	Details		Veighting in final course grade (%)		
	Disserta	tion			100		
Additional Course Information		course code: ENVS3015. from major coordinator is required.	·	'			

MATH1011 University mat				cademic Year	2014	
Offering Department	Mathemati	cs	G	Quota		
Course Co-ordinator	Dr K H Lav	w, Mathematics (lawkaho@maths.hi	ku.hk)			
Teachers Involved		v, Mathematics				
Course Objectives	them with	e aims at students with only HKD basic knowledge of mathematics th o be followed by MATH1013 Univer	at serves as essential for			
Course Contents & Topics	- Permutat - Mathema - Exponem - Trigonom - Limits of - Derivative - Differenti - Maxima a - Indefinite - Area - Integratio	- 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				
Course Learning Outcomes	1. Use the 2. Solve pr 3. Evaluate 4. Comput	On successful completion of this course, students should be able to:  1. Use the set notations; calculate probabilities; and prove by induction.  2. Solve problems involving exponential, logarithmic and trigonometric functions.  3. Evaluate limits and derivatives.  4. Compute simple definite and indefinite integrals.  5. Solve practical problems such as determining maxima and minima; finding area.				
Pre-requisites (and Co-requisites and Impermissible combination)	Mathemati	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.				
Offer in 2014 - 2015	Y 1st s	sem 2nd sem	E	xamination	Dec May	
Offer in 2015 - 2016	Υ					
Course Grade	A+ to F					
Grade Descriptors	В	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.				
	and their applications through correctly analysing problems, but with some minor inadequacies in arguments, identifying the appropriate theorems or their applications and presentation or with some minor computational errors.					
	Demonstrate an acceptable understanding of key concepts and ideas by being able to correctly identify appropriate theorems, but with some inadequacies in applying the theorems through incorrectly analysing problems with poor argument and presentation or a number of minor computational errors.					
	Demonstrate some understanding of key concepts and ideas by being able to correctly identify appropriate theorems, but with substantial inadequacies in applying the theorems through incorrectly analysing problems with poor argument or presentation or with substantial computational errors.					
	Fail	Demonstrate poor and inadequate under applications, or not being able to complete		to identify appropria	te theorems or their	
Course Type	Lecture-ba	sed course				
Course Teaching & Learning Activities	Activities	1	Details		No. of Hours	
Julining routines	Lectures				36	
	Tutorials				12	
	Reading /	Self study			100	
Assessment Methods and Weighting	Methods		Details		Weighting in fina	
	Assignme	nts	assignments, tu participation, etc	utorials,	5	
	Examination				50	
	Test		3 tests		45	
Required/recommended reading and online materials	To be deci	ded				
Course Website	http://hkum	nath.hku.hk/course/MATH1011/				

MATH1013 University mat	Academic Year	2014	
Offering Department	Mathematics	Quota	650
Course Co-ordinator	Dr Y M Chan (1st sem); Prof J H Lu (2nd sem), Mati jhlu@maths.hku.hk)	hematics (ymchan	@maths.hku.hk;

		nan (1st sem), Mathematics u (2nd sem), Mathematics				
Course Objectives	backgroun applied in concepts	This course aims at students with Core Mathematics plus Module 1 or Core Mathematics plus Module 2 background and provides them with basic knowledge of calculus and some linear algebra that can be applied in various disciplines. It is expected to be followed by courses such as MATH2012 (Fundamental concepts of mathematics), MATH2101 (Linear Algebra I), MATH2102 (Linear Algebra II), MATH2211 (Multivariable calculus), and MATH2241 (Introduction to mathematical analysis).				
Course Contents & Topics	- Limits, co - Mean va - Higher or - Radian, or - Improper - Complex - Basic ma	s; graphs; inverse functions ontinuity and differentiability lue theorem; implicit differentiation; lue theorem; implicit differentiation; lue theorem; maxima and minima calculus of trigonometric functions integration, partial fractions, integration numbers, polar form, de Moivre's foatrix and vector (of order 2 and 3) oper ordinary differential equations	a, graph sketching on by parts ormula			
Course Learning Outcomes	On succes	ssful completion of this course, stude	ents should be able to:			
	<ol> <li>Evaluat</li> <li>Apply a sketch gra</li> <li>Solve p</li> <li>Perform</li> </ol>	ne properties of a function and an invite various kinds of limits, and determ divanced rules/techniques of differer aphs of functions.  Toblems involving complex numbers a matrix and vector operations, compimple first order ordinary differential	ine continuity and differ ntiation and integration i. oute determinants.			
Pre-requisites (and Co-requisites and Impermissible combination)	fulfill this r Not for s (MATH185	r above in Module 1, or Module 2 or requirement are advised to take MAT students who have passed MATH 51 Calculus and ordinary differentia or have already enrolled in this cour	ΓΗ1011 University math l1821 Mathematical m al equations and MATH	nematics I; and nethods for actuari	ial science I, or	
Offer in 2014 - 2015	Y 1st	sem 2nd sem		Examination	Dec May	
Offer in 2015 - 2016	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				
	B	their applications through correctly analys	sing problems, but with some	minor inadequacies in a	arguments, identifying	
	С	their applications through correctly analys the appropriate theorems or their applicati Demonstrate an acceptable understandin theorems, but with some inadequacies in	sing problems, but with some ions and presentation or with g of key concepts and ideas n applying the theorems thro	minor inadequacies in a some minor computation by being able to correct ugh incorrectly analysing	arguments, identifying nal errors.  ly identify appropriate	
		their applications through correctly analys the appropriate theorems or their applicati Demonstrate an acceptable understandin	sing problems, but with some lons and presentation or with g of key concepts and ideas a applying the theorems thro f minor computational errors. ey concepts and ideas by lies in applying the theorems	minor inadequacies in a some minor computatior by being able to correct ugh incorrectly analysin being able to correctly s through incorrectly ana	arguments, identifying nal errors.  ly identify appropriate g problems with poor identify appropriate	
	С	their applications through correctly analys the appropriate theorems or their applications theorems, but with some inadequacies in argument and presentation or a number or Demonstrate some understanding of ke theorems, but with substantial inadequacies.	sing problems, but with some lons and presentation or with g of key concepts and ideas n applying the theorems thro f minor computational errors. ey concepts and ideas by cies in applying the theorems lostantial computational errors erstanding by not being ab	minor inadequacies in some minor computation by being able to correct ugh incorrectly analysing able to correctly s through incorrectly analysing the incorrectly and incorrectly analysing the incorrect analysing the incorrect analysing th	arguments, identifying all errors.  ly identify appropriate g problems with poor identify appropriate alysing problems with	
Course Type	C D Fail	their applications through correctly analys the appropriate theorems or their applications the appropriate theorems or their application between the analyses and acceptable understanding theorems, but with some inadequacies in argument and presentation or a number or Demonstrate some understanding of ke theorems, but with substantial inadequacy poor argument or presentation or with substantial between the presentation or with substantial inadequacy poor argument or presentation or with substantial inadequate under the presentation or with substantial inadequate under the presentation or with substantial inadequate under the presentation or with substantial inadequate under the presentation or with substantial inadequate under the presentation or an under the presentation or an under the presentation or an under the presentation or an under the presentation or an under the presentation or an under the presentation or an under the presentation or an under the presentation or an under the presentation or an under the presentation or an under the presentation or an under the presentation or an under the presentation or an under the presentation or an under the presentation or an under the presentation or an under the presentation or under the present	sing problems, but with some lons and presentation or with g of key concepts and ideas n applying the theorems thro f minor computational errors. ey concepts and ideas by cies in applying the theorems lostantial computational errors erstanding by not being ab	minor inadequacies in some minor computation by being able to correct ugh incorrectly analysing able to correctly s through incorrectly analysing the incorrectly and incorrectly analysing the incorrect analysing the incorrect analysing th	arguments, identifying all errors.  ly identify appropriate g problems with poor identify appropriate alysing problems with	
Course Teaching	C D Fail	their applications through correctly analys the appropriate theorems or their application bemonstrate an acceptable understandin theorems, but with some inadequacies in argument and presentation or a number of Demonstrate some understanding of ketheorems, but with substantial inadequacies or argument or presentation or with substantial poor argument or presentation or with substantial inadequacies or argument or presentation or with substantial inadequacies.	sing problems, but with some lons and presentation or with g of key concepts and ideas n applying the theorems thro f minor computational errors. ey concepts and ideas by cies in applying the theorems lostantial computational errors erstanding by not being ab	minor inadequacies in some minor computation by being able to correct ugh incorrectly analysing able to correctly s through incorrectly analysing the incorrectly and incorrectly analysing the incorrect analysing the incorrect analysing th	arguments, identifying all errors.  ly identify appropriate g problems with poor identify appropriate alysing problems with	
Course Teaching	C D Fail Lecture-ba	their applications through correctly analys the appropriate theorems or their application bemonstrate an acceptable understandin theorems, but with some inadequacies in argument and presentation or a number of Demonstrate some understanding of ketheorems, but with substantial inadequacies or argument or presentation or with substantial poor argument or presentation or with substantial inadequacies or argument or presentation or with substantial inadequacies.	sing problems, but with some lons and presentation or with g of key concepts and ideas a applying the theorems thro f minor computational errors. ay concepts and ideas by cies in applying the theorems stantial computational errors erstanding by not being ab e the solution.	minor inadequacies in some minor computation by being able to correct ugh incorrectly analysing able to correctly s through incorrectly analysing the incorrectly and incorrectly analysing the incorrect analysing the incore	arguments, identifying all errors.  by identify appropriate g problems with poor identify appropriate allysing problems with te theorems or their	
Course Teaching	C D Fail Lecture-ba Activities	their applications through correctly analys the appropriate theorems or their application bemonstrate an acceptable understandin theorems, but with some inadequacies in argument and presentation or a number of Demonstrate some understanding of ketheorems, but with substantial inadequacies or argument or presentation or with substantial poor argument or presentation or with substantial inadequacies or argument or presentation or with substantial inadequacies.	sing problems, but with some lons and presentation or with g of key concepts and ideas a applying the theorems thro f minor computational errors. ay concepts and ideas by cies in applying the theorems stantial computational errors erstanding by not being ab e the solution.	minor inadequacies in some minor computation by being able to correct ugh incorrectly analysing able to correctly s through incorrectly analysing the incorrectly and incorrectly analysing the incorrect analysing the incore	arguments, identifying all errors.  Ity identify appropriate g problems with poor identify appropriate allysing problems with te theorems or their identify.  No. of Hours  36	
Course Teaching	C D Fail Lecture-ba Activities Lectures Tutorials	their applications through correctly analys the appropriate theorems or their application bemonstrate an acceptable understandin theorems, but with some inadequacies in argument and presentation or a number of Demonstrate some understanding of ketheorems, but with substantial inadequacies or argument or presentation or with substantial poor argument or presentation or with substantial inadequacies or argument or presentation or with substantial inadequacies.	sing problems, but with some lons and presentation or with g of key concepts and ideas a applying the theorems thro f minor computational errors. ay concepts and ideas by cies in applying the theorems stantial computational errors erstanding by not being ab e the solution.	minor inadequacies in some minor computation by being able to correct ugh incorrectly analysing able to correctly s through incorrectly analysing the incorrectly and incorrectly analysing the incorrect analysing the incore	arguments, identifying hal errors.  Ity identify appropriate g problems with poor identify appropriate alysing problems with the theorems or their  No. of Hours  36	
Course Teaching & Learning Activities	C D Fail Lecture-ba Activities Lectures Tutorials	their applications through correctly analys the appropriate theorems or their application bemonstrate an acceptable understanding theorems, but with some inadequacies in argument and presentation or a number of Demonstrate some understanding of ketheorems, but with substantial inadequacies or argument or presentation or with substantial poor argument or presentation or with substantial inadequate undeapplications, or not being able to complete assed course	sing problems, but with some lons and presentation or with g of key concepts and ideas a applying the theorems thro f minor computational errors. ay concepts and ideas by cies in applying the theorems stantial computational errors erstanding by not being ab e the solution.	minor inadequacies in some minor computation by being able to correct ugh incorrectly analysing through incorrectly and incorrectly and incorrectly and incorrectly and incorrectly and incorrectly and incorrectly and incorrectly and incorrectly and incorrectly and incorrectly analysing	arguments, identifying all errors.  Ity identify appropriate g problems with poor identify appropriate allysing problems with te theorems or their No. of Hours	
Course Teaching & Learning Activities  Assessment Methods	C D Fail Lecture-ba Activities Lectures Tutorials Reading	their applications through correctly analys the appropriate theorems or their application bemonstrate an acceptable understandin theorems, but with some inadequacies in argument and presentation or a number of Demonstrate some understanding of ke theorems, but with substantial inadequacy poor argument or presentation or with sub Demonstrate poor and inadequate undeapplications, or not being able to complete ased course	sing problems, but with some ions and presentation or with g of key concepts and ideas a applying the theorems throf minor computational errors. The concepts and ideas by cies in applying the theorems stantial computational errors erstanding by not being able the solution.  Details	minor inadequacies in some minor computation by being able to correct ugh incorrectly analysing through incorrectly and incorrectly and incorrectly and incorrectly and incorrectly and incorrectly and incorrectly and incorrectly and incorrectly and incorrectly and incorrectly analysing	arguments, identifying all errors.  Ity identify appropriate g problems with poor identify appropriate allysing problems with te theorems or their  No. of Hours  36  12  100  Weighting in final course grade (%)	
Course Teaching & Learning Activities  Assessment Methods	C D Fail Lecture-ba Activities Lectures Tutorials Reading Methods	their applications through correctly analys the appropriate theorems or their application bemonstrate an acceptable understandin theorems, but with some inadequacies in argument and presentation or a number of Demonstrate some understanding of ketheorems, but with substantial inadequacy poor argument or presentation or with subdemonstrate poor and inadequate understanding of the properties of the properti	sing problems, but with some ions and presentation or with g of key concepts and ideas a applying the theorems throf minor computational errors. The concepts and ideas by cies in applying the theorems stantial computational errors erstanding by not being able the solution.  Details	minor inadequacies in some minor computation by being able to correct ugh incorrectly analysing through incorrectly and incorrectly and incorrectly and incorrectly and incorrectly and incorrectly and incorrectly and incorrectly and incorrectly and incorrectly and incorrectly analysing	arguments, identifying all errors.  Ity identify appropriate g problems with poor identify appropriate allysing problems with the theorems or their  No. of Hours  100  Weighting in final course grade (%)	
Course Teaching & Learning Activities  Assessment Methods	C D Fail Lecture-ba Activities Lectures Tutorials Reading Methods Assignment	their applications through correctly analys the appropriate theorems or their application bemonstrate an acceptable understandin theorems, but with some inadequacies in argument and presentation or a number of Demonstrate some understanding of ketheorems, but with substantial inadequacy poor argument or presentation or with subdemonstrate poor and inadequate understanding of the properties of the properti	sing problems, but with some ions and presentation or with g of key concepts and ideas a applying the theorems throf minor computational errors. The concepts and ideas by cies in applying the theorems stantial computational errors erstanding by not being able the solution.  Details	minor inadequacies in some minor computation by being able to correct ugh incorrectly analysing through incorrectly and incorrectly and incorrectly and incorrectly and incorrectly and incorrectly and incorrectly and incorrectly and incorrectly and incorrectly and incorrectly analysing	arguments, identifying all errors.  Ity identify appropriate g problems with poor identify appropriate allysing problems with the theorems or their  No. of Hours  No. of Hours  100  Weighting in final course grade (%)  10  50	
Course Type Course Teaching & Learning Activities  Assessment Methods and Weighting  Required/recommended reading and online materials	C  Fail  Lecture-ba  Activities Lectures Tutorials Reading  Methods  Assignment Examinat Test  Adrian Ba Press, 200 George B.	their applications through correctly analys the appropriate theorems or their applications through correctly analys the appropriate theorems or their application of their applications are supported by the property of the application of a number of the property of the application of the theorems, but with substantial inadequact poor argument or presentation or with substantial property of the applications, or not being able to complete assed course.  Self study  The Calculus Lifesaver: All the applications the applications of the application	ing problems, but with some ions and presentation or with g of key concepts and ideas in applying the theorems through the concepts and ideas by its in applying the theorems in applying the theorems in applying the theorems is the computational errors in a problem in a problem in a problem in a problem in a problem in a problem in a problem in a problem in a problem in a problem in a problem in a problem in a problem in a problem in a problem.  Details  Details  Details	minor inadequacies in a some minor computation by being able to correct und incorrectly analysing through incorrectly and inco	arguments, identifying all errors.  Ity identify appropriate g problems with poor identify appropriate allysing problems with the theorems or their  No. of Hours  100  Neighting in final course grade (%)  10  50  40	

MATH1641 Mathematical	laboratory and modeling (6 credits)	Academic Year	2014
Offering Department	Mathematics	Quota	20
Course Co-ordinator	TBC, Mathematics ()		
Teachers Involved	TBC, Mathematics		
Course Objectives	This course introduces a powerful and free computer software Sc	ilab for scientific res	earch. The

	Biology, E	ing language will be taught via a necology, Statistics and Management. ebra will also be covered.			
Course Contents & Topics	etc. Data	ementary mathematical modeling, predifiting models and simulation of simpliferentiation and integration of one vari	le random variable. Ra	andom walk mode	
Course Learning Outcomes	1. Recogn 2. Demon 3. Write at 4. Solve s	ssful completion of this course, students ize the importance of numerical methor strate basic algebraic and arithmetic co nd interpret programs in Scilab program imple numerical problems using interact noderately complicated numerical problems	ds in mathematical mo imputations in the Scila nming language. stive Scilab commands.	b environment.	
Pre-requisites (and Co-requisites and Impermissible combination)	NIL				
Offer in 2014 - 2015	N			Examination	
Offer in 2015 - 2016	Υ				
Course Grade	A+ to F				
Grade Descriptors	Α	A Demonstrate an excellent understanding of key concepts and Scilab skills by being able to identify the appropriate Scilab environments and their applications through correctly analysing problems, clearly and efficiently presenting correct algorithms and being able to solve numerical problems by writing Scilab programs carefully and correctly, and with some innovative approaches to solving problems.			
	В	B Demonstrate a good understanding of key concepts and Scilab skills by being able to identify the appropriate Scilab environments and their applications through correctly analysing problems, but with some minor inadequacies in identifying the appropriate Scilab components or presenting correct algorithms or with some minor programming/computational errors.			
	С	Demonstrate an acceptable understanding of key concepts and Scilab skills by being able to correctly identify appropriate Scilab environments, but with some inadequacies in solving numerical problems with Scilab through incorrectly analysing problems with inappropriate Scilab environments or with a number of minor programming/computational errors.			
	D	Demonstrate some understanding of key concepts and Scilab skills by being able to correctly identify appropriate Scilab environments, but with substantial inadequacies in solving numerical problems with Scilab through incorrectly analysing problems with inappropriate Scilab environments or with substantial programming/computational errors.			
	Fail	Demonstrate poor and inadequate understanding by not being able to identify appropriate Scilab environments or their applications, or not being able to complete the solution.			
Course Type	Lecture-ba	ased course			
Course Teaching	Activities	<b>S</b>	Details		No. of Hours
& Learning Activities	Lectures				36
	Tutorials				12
	Reading	/ Self study			100
Assessment Methods and Weighting	Methods		Details		eighting in final ourse grade (%)
	Examinat	tion			50
	Test				50
Required/recommended reading and online materials	F. R. Gio	ided by the course instructor. rdano, M. D. Weir, W. P. Fox: A first ole Thomson Learning, 2003)	t course in mathemati	cal modeling, (Pa	cific Grove, CA:
Course Website	http://hkur	nath.hku.hk/course/MATH1641/			

MATH1821 Mathematical	methods for actuarial science I (6 credits)	Academic Year	2014		
Offering Department	Mathematics	Quota			
Course Co-ordinator	Dr C W Wong, Mathematics (cwwongab@hku.hk)				
Teachers Involved	Dr C W Wong, Mathematics				
Course Objectives	This course is the first of the two mathematics courses designe a solid background of calculus of one and several variables course focuses on single variable calculus and elementary m Mathematics plus Module 1 or Core Mathematics plus Module 2	and an introduction to linatrix theory. It aims at st	near algebra. The		
Course Contents & Topics	<ul> <li>Functions; graphs; inverse functions</li> <li>Limits, continuity and differentiability</li> <li>Mean value theorem; implicit differentiation; L'Hopital's rule</li> <li>Bisection method and Newton's method</li> <li>Higher order derivatives, maxima and minima, graph sketching</li> <li>Taylor approximation and error estimation</li> <li>Improper integrals, partial fractions, integration by parts</li> <li>Numerical integration, Trapezoidal rule and Simpson's rule</li> <li>Basic matrix and vector (of order 2 and 3) operations, determines</li> <li>Simple differential equations</li> </ul>	•			
Course Learning Outcomes	On successful completion of this course, students should be ab	le to:			

	2. Evalua 3. Apply sketch gr 4. Approx 5. Perfore	be properties of a function and an inver- tite various kinds of limits, and determine advanced rules/techniques of differenti- aphs of functions. kimate integrals by numerical methods. In matrix and vector operations, comput- simple first and second order ordinary described.	e continuity and differ ation and integration te determinants.			
Pre-requisites (and Co-requisites and Impermissible combination)	Module 2 Not for so ordinary enrolled in	or above in HKDSE Mathematics plus Now, or equivalent; and students who have passed MATH1013 differential equations and MATH1853 In these courses.  ActuarSc) students only.	3 University mathema	atics II or (MATH1	1851 Calculus and	
Offer in 2014 - 2015	Y 1s	Y 1st sem Examination Dec				
Offer in 2015 - 2016	Υ					
Course Grade	A+ to F					
Grade Descriptors	A	Demonstrate an excellent understanding of theorems and their applications through corn reasoning and argumentation and being all innovative approaches to solving problems.	ectly analysing problems, o	learly and elegantly pr	esenting correct logical	
	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	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 their applications, or not being able to complete the solution.				
Course Type	Lecture-k	pased course				
Course Teaching	Activitie	9S	Details		No. of Hours	
& Learning Activities	Lectures	3			36	
	Tutorials	5			12	
	Reading	Reading / Self study			100	
Assessment Methods and Weighting	Method	s	Details		Weighting in final course grade (%)	
	Examina	ation			50	
	Test		2 tests		50	
Required/recommended reading and online materials	(Addison	George B. Thomas; as revised by Maurice D. Weir and Joel Hass: Thomas' Calculus, 12th edition (Addison Wesley) Steven J. Leon: Linear Algebra with Applications (Pearson Prentice Hall) NIL				
Course Website	http://hku	math.hku.hk/course/MATH1821/				

MATH1851 Calculus and	ordinary differential equations (6 credits)	Academic Year	2014
Offering Department	Mathematics	Quota	560
Course Co-ordinator	Prof K M Tsang (1st sem); Dr Y K Lau (2nd sem), Matlyklau@maths.hku.hk)	hematics (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 Z Wang (2nd sem), Mechanical Engineering		
Course Objectives	In this course, students will be introduced to some important topics many engineering fields. A concrete foundation of engineering mat engineering subjects will be built. Mathematical concepts and p engineering applications, would be emphasized so that students coul solving engineering problems, and be well prepared in learning a required in different engineering disciplines.	hematics that unde rinciples, as well d enhance their mat	rpins the various as some typical chematical skills in
Course Contents & Topics	Differential and Integral Calculus (Single Variable)     Ordinary Differential Equations     Laplace Transforms     For more information, please refer to http://hkurMATH1851.description	math.hku.hk/MathW	WW/ucourse.php?
Course Learning Outcomes	On successful completion of this course, students should be able to:  1. Demonstrate knowledge and understanding of the basic engine relationship with some typical engineering applications.  2. Apply mathematical skills to model and solve some basic engineeri 3. Have a general grasp on the interrelation among mathematical	ng problems.	

	engineering For mo	I prepared to cope with a higher legg disciplines. re information, please refer	0 0	mathematics requ	
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in MA	above in Module 1, or Module 2 of HKD ATH1011 University Mathematics I se is exclusively for engineering student		equivalent, or	
Offer in 2014 - 2015	Y 1st s	sem 2nd sem		Examination	Dec May
Offer in 2015 - 2016	Υ				
Course Grade	A+ to F				
Grade Descriptors	A	Demonstrate an excellent understanding of theorems and methods and their applications correct logical reasoning and argumentation a with some innovative approaches to solving pre	through correctly analysing and being able to carry coblems.	ng problems, clearly and out computations careful	l elegantly presenting lly and correctly, and
	B Demonstrate a good understanding of key concepts and ideas by being able to identify the appropriate theorems and methods and their applications through correctly analysing problems, but with some minor inadequacies in arguments, identifying the appropriate theorems and methods or their applications and presentation or with some minor computational errors.				
	C Demonstrate an acceptable understanding of key concepts and ideas by being able to correctly identify appropriate theorems and methods, but with some inadequacies in applying them through incorrectly analysing problems with poor argument and presentation or a number of minor computational errors.				
	Demonstrate some understanding of key concepts and ideas by being able to correctly identify appropriate theorems and 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 understand their applications, and not being able to comple		dentify appropriate theorem	rems and methods or
Course Type	Lecture-ba	sed course			
Course Teaching	Activities		Details		No. of Hours
& Learning Activities	Lectures				36
	Tutorials				12
	Reading /	Self study			100
Assessment Methods and Weighting	Methods		Details		Veighting in final course grade (%)
	Examinati	on			80
	Test 2 tests		2 tests		20
Required/recommended reading and online materials	Introduction	n to Calculus and Ordinary Differential I	Equations (Pearson)	)	
Course Website	http://hkum	nath.hku.hk/course/MATH1851/			
Additional Course Information	Students a	oe no 'make-up' for a missed test or ass re not allowed to take MATH1851 and l e is offered by the Department of Mathe	MATH1853 together	in the same semes	ster.

MATH1853 Linear algebra	, probability and statistics (6 credits)	Academic Year	2014
Offering Department	Mathematics	Quota	560
Course Co-ordinator	Prof W K Ching (1st sem); Dr G Han (2nd sem), Mathematics (	wching@hku.hk)	
Teachers Involved	Prof W K Ching (1st sem), Mathematics Dr G Han (2nd sem), Mathematics Dr N Wong (1st sem), Electrical & Electronic Engineering Dr Y C Wu (2nd sem), Electrical & Electronic Engineering		
Course Objectives	As the consecutive course of MATH1851, students will be commonly applied in engineering so that students could be mathematics underpinned for different engineering subjects concepts, principles, analysis, and their relationship to the m could be furnished with the essential mathematical skill to a problems to prepare for all the engineering subjects.	further enhanced with a s. The course emphasiz odelling of engineering sy	concrete skill es mathematica ystems. Studen
Course Contents & Topics	<ul> <li>Vector Algebra; Matrix Algebra; Eigenvalues Problems</li> <li>Elementary Complex Variables</li> <li>Basic Probability Laws; Random Variables, Probability Distrib</li> <li>Binomial, Geometric, and Poisson Distribution; Normal Distrib</li> <li>Sampling distribution, Point Estimates and Confidence Intervation</li> <li>For more information, please refer to http</li> <li>MATH1853.description</li> </ul>	ution	
Course Learning Outcomes	On successful completion of this course, students should be about 1. Demonstrate knowledge and understanding of the essential relationship to the engineering problems in general.  2. Model an engineering problem into a mathematical form calgebraic equation, a differential equation, a graph, or some off	al engineering mathematic	which can be a

	4. Have a problem. For me	ne model by selecting and applying a subsequence grasp on the interrelation and ore information, please refluences.	mong mathematical		I the engineering
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in MA	above in Module 1, or Module 2 of HKI ATH1011 University Mathematics I se is exclusively for Engineering studer		equivalent, or	
Offer in 2014 - 2015	Y 1st	sem 2nd sem		Examination	Dec May
Offer in 2015 - 2016	Υ				
Course Grade	A+ to F				
Grade Descriptors	A	Demonstrate an excellent understanding of theorems and methods and their applications correct logical reasoning and argumentation with some innovative approaches to solving p	through correctly analysis and being able to carry of	ng problems, clearly and	d elegantly presenting
	В	Demonstrate a good understanding of key cor methods and their applications through co arguments, identifying the appropriate theore minor computational errors.	rrectly analysing problen	ns, but with some min	nor inadequacies in
	C Demonstrate an acceptable understanding of key concepts and ideas by being able to correctly identify appropriate theorems and methods, but with some inadequacies in applying them through incorrectly analysing problems with poor argument and presentation or a number of minor computational errors.				
	D Demonstrate some understanding of key concepts and ideas by being able to correctly identify appropriate theorems and 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 understand their applications, or not being able to complete		dentify appropriate theo	rems and methods or
Course Type	Lecture-ba	sed course			
Course Teaching	Activities Details		Details		No. of Hours
& Learning Activities	Lectures				36
	Tutorials				12
	Reading / Self study				100
Assessment Methods and Weighting	Methods		Details		Veighting in final course grade (%)
	Assignme	ents			20
	Examinati	ion			80
Required/recommended reading and online materials	D.C. Lay: Linear Algebra and its Applications (Addison-Wesley, 2012, 4th ed.) S.J. Leon: Linear Algebra with Applications (Pearson Education, 2006, 7th ed.) G. James, et al.: Modern Engineering Mathematics (Pearson Education, 2008, 4th ed.) C. Rorres and H. Anton: Applications of Linear Algebra (Wiley, 1984, 3rd ed.) E. Kreyzig: Advanced Engineering Mathematics (Wiley, 2006, 9th ed.)				
Course Website	http://hkum	nath.hku.hk/course/MATH1853/			
Additional Course Information	Students a	be no 'make-up' for a missed quiz or as are not allowed to take MATH1851 and e is offered by the Department of Math	MATH1853 together	in the same semes	

concepts of mathematics (6 credits)	Academic Year	2014
Mathematics	Quota	
Dr Y M Chan, Mathematics (ymchan@maths.hku.hk,	)	
Dr Y M Chan, Mathematics		
mathematical proofs. Such concepts and methods a	are important for subsequent studies	s in all higher leve
- elementary set theory - statement calculus - mathematical proofs - relations and functions - finite and infinite sets - natural numbers and mathematical induction - axiomatic systems in mathematics - real numbers and the limit of a sequence - examples of groups		
<ol> <li>Understand the definition of a set and apply set the</li> <li>Construct the truth table of a given statement.</li> <li>Apply different proof strategies (e.g. proof by comathematical statement.</li> <li>Demonstrate the basic properties of equivalence re</li> </ol>	eory in simple daily life problems.  ontradiction and mathematical inductions.	ction) in proving a
	Mathematics  Dr Y M Chan, Mathematics (ymchan@maths.hku.hkg) Dr Y M Chan, Mathematics  To provide students with solid background on fun mathematical proofs. Such concepts and methods a courses in mathematics. This course can be taken or elementary set theory - statement calculus - mathematical proofs - relations and functions - finite and infinite sets - natural numbers and mathematical induction - axiomatic systems in mathematics - real numbers and the limit of a sequence - examples of groups  On successful completion of this course, students sh  1. Understand the definition of a set and apply set th 2. Construct the truth table of a given statement. 3. Apply different proof strategies (e.g. proof by conathematical statement. 4. Demonstrate the basic properties of equivalence results.	Mathematics  Dr Y M Chan, Mathematics (ymchan@maths.hku.hk)  Dr Y M Chan, Mathematics  To provide students with solid background on fundamental concepts of mathematics mathematical proofs. Such concepts and methods are important for subsequent studies courses in mathematics. This course can be taken concurrently with other Level 2 or about elementary set theory - statement calculus - mathematical proofs - relations and functions - finite and infinite sets - natural numbers and mathematical induction - axiomatic systems in mathematics - real numbers and the limit of a sequence - examples of groups  On successful completion of this course, students should be able to:  1. Understand the definition of a set and apply set theory in simple daily life problems. 2. Construct the truth table of a given statement. 3. Apply different proof strategies (e.g. proof by contradiction and mathematical induction

	6. Demonstrate the operational properties of groups.				
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in MATH1013 University mathematics II or (MATH1851 Calculus and ordinary differential equations and MATH1853 Linear algebra, probability and statistics)				
Offer in 2014 - 2015	Y 1st	1st sem 2nd sem Examination Dec			Dec May
Offer in 2015 - 2016	Y				
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 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 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 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 (%)
	Examination				50
	Test				50
Required/recommended reading and online materials	Gray Chartrand, Albert D Polimeni and Ping Zhang: Mathematical Proofs: A Transition to Advanced Mathematics Boston (Pearson/Addison-Wesley, 2008)				
Course Website	http://hkumath.hku.hk/course/MATH2012/				
Additional Course Information	Students with good grades in HKDSE Math Module 1 or Math Module 2 and have strong interests in math may also apply.				

MATH2014 Multivariable of	alculus and linear algebra (6 credits)	Academic Year	2014		
Offering Department	Mathematics	Quota			
Course Co-ordinator	Dr J T Chan, Mathematics (jtchan@hku.hk)				
Teachers Involved	Dr J T Chan, Mathematics				
Course Objectives	To provide students with a solid foundation in calculus of several variables and linear algebra, which they will need in the study of mathematics related subjects.				
Course Contents & Topics	Vectors and Matrices: Vectors in space, dot product and cross product, determinant Partial Derivatives: Functions of several variables, partial derivatives, extrem formula  Multiple Integrals: Double and triple integrals, substitution in multiple integrals  Matrix Algebra: Matrix addition and multiplication, system of linear equations  Vector spaces: The Euclidean spaces as vector spaces, its subspaces, spadimension  Eigenvalues and eigenvectors: Diagonalization and computing powers  Numerical Methods: Bisection method and Newton's method for finding roots of effor numerical integration	e values and Lagrange m as a matrix equation an of vectors, linear indepen	ultipliers, Taylor'		
Course Learning Outcomes	On successful completion of the course, students should be able to:				
	1. Understand the geometric meaning of partial and direction	nal derivatives.			

	<ol> <li>Optimize multivariate objective functions (with/without constraints).</li> <li>Evaluate integrals over curvilinear regions in space.</li> <li>Understand the concept of vector spaces, basis, dimension.</li> <li>Solve simple eigenvalue problems and apply the theory to practical problems.</li> </ol>					
Pre-requisites (and Co-requisites and Impermissible combination)	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.				ial science II or	
Offer in 2014 - 2015	Y 2nd	sem	E	xamination	May	
Offer in 2015 - 2016	Υ	Y				
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 analyzing 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 analyzing 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 analyzing problems with poor argument and presentation or a number of minor computational errors.				
	D Demonstrate some understanding of key concepts and ideas by being able to correctly identify appropriate theorems, but with substantial inadequacies in applying the theorems through incorrectly analyzing 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 their applications, or not being able to complete the solution.				
Course Type	Lecture-ba	Lecture-based course				
Course Teaching & Learning Activities	Activities	:	Details		No. of Hours	
	Lectures				36	
	Tutorials				12	
	Reading / Self study				100	
Assessment Methods and Weighting	Methods		Details		Weighting in final course grade (%)	
	Examination				50	
	Test				50	
Required/recommended reading and online materials	TBC					
Course Website	http://hkumath.hku.hk/course/MATH2014/					
Additional Course Information	Nil					

MATH2101 Linear algebra	I (6 credits)	Academic Year	2014	
Offering Department	Mathematics	Quota		
Course Co-ordinator	Dr K H Law, Mathematics (lawkaho@maths.hku.hk)	'		
Teachers Involved	Dr K H Law, Mathematics			
Course Objectives	This is a first university level course on linear algebra, which aims at introducing to students the basic concept of linear structure through many concrete examples in the Euclidean spaces. The course also enriches students' exposure to mathematical rigor and prepares them for studying more advanced mathematical courses.			
Course Contents & Topics	<ol> <li>Vector Geometry in R^2 and R^3: Revision of addition at lines and planes; and applications to geometry.</li> <li>Matrix Algebra: Matrix addition and multiplication, detern of linear equations as a matrix equation.</li> <li>Systems of Linear Equations: Gauss-Jordan elimination, elementary matrices, matrix inversion.</li> <li>Vector Spaces: Coordinate system in R^n, the Euclidean of vectors, linear independence, basis, dimension, chapplications.</li> <li>Linear Transformations: Definition and examples of linear matrices of linear transformations, kernel and image, isomor 6. Eigenvalue Problem: Eigenvalues and eigenvectors, eigenvalues), applications.</li> <li>Inner Product: Gram-Schmidt process, least square problem.</li> </ol>	elementary row operations, spaces as vector spaces, it nange of basis (computations in R^2 ar transformations in R^1 arphism.	e matrices, system row echelon form s subspaces, spa ional examples), and R^3, standar	
Course Learning Outcomes	On successful completion of this course, students should be  1. Handle matrix operations and use them in some practice 2. Solve systems of linear equations by Gauss-Jordan elin matrices. 3. Understand the concept of vector spaces, basis, dimensional statements.	problems. nination and also compute ir		

	4. Solve	presentations of some linear transfe some simple eigenvalue problems some minimization problems by the	and apply the theory to some pract	ical problems.		
Pre-requisites (and Co-requisites and Impermissible combination)	and MAT	Pass in MATH1013 University mathematics II or (MATH1851 Calculus and ordinary differential equations and MATH1853 Linear algebra, probability and statistics)				
Offer in 2014 - 2015	Y 1s	Y 1st sem 2nd sem Examination Dec May				
Offer in 2015 - 2016	Υ			!		
Course Grade	A+ to F					
Grade Descriptors	A	theorems and their applications through	ing of key concepts and ideas by being a correctly analysing problems, clearly and and a gable to carry out computations carefulms.	elegantly presenting correct logical		
	В	and their applications through correc	key concepts and ideas by being able to ly analysing problems, but with some m their applications and presentation or with s	inor inadequacies in arguments,		
	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	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 their applications, or not being able to complete the solution.				
Course Type	Lecture-b	pased course				
Course Teaching	Activities		Details	No. of Hours		
& Learning Activities	Lectures	S		36		
	Tutorials			12		
	Reading	g / Self study		100		
Assessment Methods and Weighting	Method	s	Details	Weighting in final course grade (%)		
	Assignm	nents	assignments, tutorials, participation, etc	10		
	Examina	ation		50		
	Test		2 tests	40		
Required/recommended reading and online materials	TBC					
	http://hku					

MATH2102 Linear algebra	II (6 credits)	Academic Year	2014			
Offering Department	Mathematics	Quota				
Course Co-ordinator	Dr Y K Lau (1st sem); Dr Z Hua (2nd sem), Mathematics (yklau@maths.hku.hk; huazheng@maths.hku.hk					
Teachers Involved	Dr Y K Lau (1st sem), Mathematics Dr Z Hua (2nd sem), Mathematics					
Course Objectives	This is a follow up of the course Linear Algebra I. It aims at introducing the general concept of vector spaces, subspaces, dimensions, inner product spaces, etc. The course prepares the foundation on linear algebra for students' future study in mathematics and other disciplines. Many examples of applications will be drawn on different subject areas.					
Course Contents & Topics	<ol> <li>Vector Spaces: Definition and examples, subspaces, kernel and image, row and column spaces an rank of a matrix, linear independence, basis, dimension.</li> <li>Determinant and its properties.</li> <li>Linear Transformations: matrix representation, change of basis.</li> <li>Eigenvalue Problem: Characteristic polynomial, Cayley theorem, eigen-subspaces.</li> <li>Inner Product Spaces: Inner product, Gram-Schmidt orthogonalization, orthonormal basis, self-adjoir operators.</li> <li>Diagonalization of Matrices.</li> </ol>					
Course Learning Outcomes	On successful completion of this course, students should be able to:  1. Identify vector space structures and apply relevant knowledge to some practical problems.  2. Understand the notion of subspaces and compute basis, dimension, etc.  3. Relate linear transformations with matrices.  4. Solve some eigenvalue problems and apply the theory to some practical problems.  5. Understand the notion of inner product space and diagonalize certain matrices.					
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in MATH2101 Linear algebra I or MATH2822 Mathematic	atical methods for actuarial so	cience II			
Offer in 2014 - 2015	Y 1st sem 2nd sem	Examination	Dec May			

Offer in 2015 - 2016	Υ	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 land their applications through correctlidentifying the appropriate theorems or ti	y analysing problems, but with sor	me minor inadequacies in arguments,		
	С	Demonstrate an acceptable understanding of key concepts and ideas by being able to correctly identify appropriate theorems, but with some inadequacies in applying the theorems through incorrectly analysing problems with poor argument and presentation or a number of minor computational errors.				
	D	Demonstrate some understanding of key concepts and ideas by being able to correctly identify appropriate theorems, but with substantial inadequacies in applying the theorems through incorrectly analysing problems with poor argument or presentation or with substantial computational errors.				
	Fail	Demonstrate poor and inadequate unapplications, or not being able to comple		identify appropriate theorems or their		
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 (%)		
	Examination			50		
	Test			50		
Required/recommended reading and online materials	TBC					
Course Website	http://hk	umath.hku.hk/course/MATH2102/				

MATH2211 Multivariable cal	culus (6 d	credits)	Academic Year	2014		
Offering Department	Mathematics Quota					
Course Co-ordinator	Dr Z Hua (1st sem); Dr S P Yung (2nd sem), Mathematics (huazheng@maths.hku.hk; spyung@hku.hk)					
Teachers Involved		1st sem), Mathematics ng (2nd sem), Mathematics				
Course Objectives	Students of this course will learn the theory of multivariable calculus and learn how to apply the theory to solve practical problems. This is a required course for students taking major in Mathematics or Mathematics/Physics, and is suitable for all students majoring in sciences, engineering, economics and finance and other students who will use multivariable calculus in their area of study. Students taking minor in Mathematics may take this course as one of the required courses. This course is a pre-requisite of many mathematics courses of more advanced level. Students interested in a theoretical (proof based) approach to single-variable calculus may take MATH2241 Introduction to mathematical analysis.					
Course Contents & Topics	<ul> <li>Vectors: vectors in 2-, 3-, and n-dimensions; dot product and cross product; lines and planes; polar, cylindrical, and spherical coordinates</li> <li>Differentiation in several variables: limits and derivatives; the chain rule; directional derivatives and gradients</li> <li>Vector-valued functions: parametrized curves; arc-length; vector fields; gradient, divergence, curl, and the del operator</li> <li>Maxima and minima: differentials and Taylor's Theorem of several variables; extrema of functions; Lagrange multipliers; applications of extrema</li> <li>Multiple integration: double and triple integrals; change of variables; applications</li> <li>Line integrals: scalar and vector line integrals; Green's Theorem; conservative vector fields</li> <li>Surface integrals and vector analysis: parametrized surfaces; surface integrals; Stoke's and Gauss's Theorems</li> </ul>					
Course Learning Outcomes	On successful completion of this course, students should be able to:  1. Understand and demonstrate the basic theory of calculus of functions in several real variables.  2. Evaluate partial derivatives and multiple integrals; compute line integrals and surface integrals.  3. Apply the knowledge to solve some practical problems, such as constrained optimization problems and other problems involving differentiation and integration of multivariable functions.					
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in MATH1013 University mathematics II or (MATH1851 Calculus and ordinary differential equations and MATH1853 Linear algebra, probability and statistics)					
Offer in 2014 - 2015	Y 1st	sem 2nd sem	Examination	Dec May		
Offer in 2015 - 2016	Υ		·			
Course Grade	A+ to F					
Grade Descriptors	A	Demonstrate an excellent understanding of key concepts and theorems and their applications through correctly analysing problem $458 $				

		reasoning and argumentation and being al innovative approaches to solving problems.	ole to carry out computations of	earefully and correctly, and with some		
	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 theorems, but with some inadequacies in a argument and presentation or a number of m	pplying the theorems through in			
	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 unders applications, or not being able to complete the		dentify appropriate theorems or their		
Course Type	Lecture-b	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 (%)		
	Assignments			10		
	Examination			50		
	Test			40		
Required/recommended reading and online materials	Susan J.	Colley: Vector Calculus, 4th edition (Pe	earson, 2011)			
Course Website	http://hku	math.hku.hk/course/MATH2211/				
Additional Course Information	Students	are assumed to have mastered calculu	s of one-variable prior to ta	aking this course.		

MATH2241 Introduction to	mathematic	cal analysis (6 credits)	Academic Year	2014			
Offering Department	Mathematic	s	Quota				
Course Co-ordinator		ne (1st sem); Dr Y M Chan (2nd sem), Ma naths.hku.hk)	athematics (bkane	e@maths.hku.hk;			
Teachers Involved		Dr B Kane (1st sem), Mathematics Dr Y M Chan (2nd sem), Mathematics					
Course Objectives	To introduce	e students to the basic ideas and techniques of mathema	tical analysis.				
Course Contents & Topics	completene - Sequence monotone s - Continuity intermediate - Differentia applications - Integratio	- The real number system: the real numbers as an ordered field, supremum and infimum, the completeness axiom, denseness of the rational numbers - Sequences and series of real numbers: limits of sequences, properties of convergent sequences, monotone sequences and Cauchy sequences, subsequences, series, tests of convergence for series - Continuity of real-valued functions: properties of continuous functions, the extreme value theorem, the intermediate value theorem, uniform continuity, limits of functions - Differentiation: properties of differentiable functions, the mean value theorem, Taylor's theorem and its applications - Integration: construction of the Riemann integral using Darboux sums and Riemann sums, the fundamental theorem of calculus					
Course Learning Outcomes	Comphre     Demonst     sequences/     Elucidate     intermediate	iful completion of the course, students should be able to: whend and use abstract mathematical arguments such as trate convergence or non-convergence of a sequence/s series. In important properties of continuous functions such as the value theorem. In the construction of the Riemann integral and its relation in	series using proper the extreme value	ties of converger			
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in MA and MATH actuarial sc	TH1013 University mathematics II or (MATH1851 Calcul 1853 Linear algebra, probability and statistics) or MA ience II	lus and ordinary dif ATH2822 Mathema	ferential equation tical methods fo			
Offer in 2014 - 2015	Y 1st se	em 2nd sem	Examination	Dec May			
Offer in 2015 - 2016	Υ			·			
Course Grade	A+ to F						
Grade Descriptors	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.					
	C Demonstrate a good understanding of the mathematical notions and proof techniques taught in the course by being						

		able to handle abstract mathematical solutions clearly and logically is expect		te theorems correctly. Ability to present
	D	Demonstrate some understanding of the appropriate theorems for applications a		e course by being able to correctly identify at are leading to complete solutions.
	Fail	Demonstrate poor and inadequate und or not being able to apply the theorems		tify appropriate theorems for applications,
Course Type	Lecture-	based course		
Course Teaching & Learning Activities	Activities		Details	No. of Hours
	Lectures			36
	Tutorials			12
	Reading / Self study			100
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)
	Examination			50
	Test			50
Required/recommended reading and online materials	Elementary Analysis: The Theory of Calculus, by Kenneth A. Ross, 1980, Springer			, Springer
Course Website	http://hk	umath.hku.hk/course/MATH2241/		

MATH2822 Mathematical n	nethods for	actuarial science II (6 credits)	Academic Year	2014			
Offering Department	Mathematic	cs	Quota				
Course Co-ordinator	Dr J T Cha	n, Mathematics (jtchan @hku.hk)					
Teachers Involved	Dr J T Cha	Dr J T Chan, Mathematics					
Course Objectives	with a solid	This course is the second of the two mathematics courses designed to provide actuarial science student 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	<ul> <li>Eigenvalu</li> <li>Quadratic</li> <li>Vector sp</li> <li>Functions</li> <li>Gradients</li> <li>Taylor ap</li> <li>Maxima a</li> </ul>	<ul> <li>Matrices, systems of linear equations, determinants</li> <li>Eigenvalues and eigenvectors, diagonalization of matrices</li> <li>Quadratic functions and their standard forms</li> <li>Vector spaces and subspaces</li> <li>Functions of several variables; partial differentiation</li> <li>Gradients and directional derivatives</li> <li>Taylor approximation, systems of nonlinear equations, Newton's method</li> <li>Maxima and minima; Lagrange multipliers</li> <li>Double and triple integrals, areas and volumes</li> </ul>					
Course Learning Outcomes	On success	sful completion of this course, students should be a	ble to:				
	systems of and the rar 2. Understa test for lo	and various topics in linear algebra such as the linear equations, eigenvalues and eigenvectors, dak-nullity theorem.  and various topics in functions of several variables cal extrema, Newton's method for solving systematics and the method of Lagrange multipliers, double the service of the	iagonalizable matrices, bas including partial differentions of nonlinear equation	sis and dimension ation, the Hessia ns, vector-valued			
Pre-requisites (and Co-requisites and mpermissible combination)		Pass in MATH1821 Mathematical methods for actuarial science I. For BSc(ActuarSc) students only.					
Offer in 2014 - 2015	Y 2nd	sem	Examination	May			
Offer in 2015 - 2016	Υ						
Course Grade	A+ to F						
Grade Descriptors	A	Demonstrate an excellent understanding of key concepts theorems and their applications through correctly analysing preasoning and argumentation and being able to carry out innovative approaches to solving problems.	oblems, clearly and elegantly pre	senting correct logica			
	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.						
Causaa Turaa	Lecture-based course						
Course Type	Lecture-ba	seu course					

& Learning Activities	Activities	Details	No. of Hours	
	Lectures		36	
	Tutorials	12		
	Reading / Self study		100	
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	
	Examination		50	
	Test	2 tests	50	
Required/recommended reading and online materials	George B. Thomas; as revised by (Addison Wesley) Steven J. Leon: Linear Algebra with A		Thomas' Calculus, 12th edition	
Course Website	http://hkumath.hku.hk/course/MATH2822/			

MATH3001 Development	of mathem	atical ideas (6 credits)		Academic Year	2014	
Offering Department	Mathema	atics		Quota		
Course Co-ordinator	Prof W K	Ching, Mathematics (wching@hku.hk)				
Teachers Involved	Prof W K	Ching, Mathematics				
Course Objectives	- To ass human e - To prov	<ul> <li>To acquaint the students with the origin and growth of basic mathematical concepts</li> <li>To assist the students to gain a deeper insight and broader view of mathematics as a discipline and human endeavour</li> <li>To provide the students with an opportunity to write on and talk about mathematics, and to engage in independent study</li> </ul>				
Course Contents & Topics	the stude	Selected topics in the development of mathematics from ancient to modern times depending on interest the students and the lecturer, with attention paid to the evolvement of mathematical ideas and the proof mathematical thinking and problem solving.				
Course Learning Outcomes	1. Unders 2. Recog appreciat 3. Discus	On successful completion of the course, students should be able to:  1. Understand and describe the origin and development of basic mathematical concepts.  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.  3. Discuss, argue, and write about the development of various mathematical concepts and ideas.  4. Engage in independent study on a topic about the history or development of mathematics.				
Pre-requisites (and Co-requisites and Impermissible combination)		Pass in MATH2101 Linear algebra I, MATH2102 Linear algebra II, MATH2211 Multivariable calculus an MATH2241 Introduction to mathematical analysis				
Offer in 2014 - 2015	N			Examination		
Offer in 2015 - 2016	N	N				
Course Grade	A+ to F					
Grade Descriptors	В	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.  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.  C Demonstrate general but incomplete grasp of the subject. Evidence of some analytical and critical abilities and					
	logical thinking. Mostly correct but some erroneous use of information from sources to draw appropriate conclusions. Make some but not substantial fruitful contributions to class discussions. Apply moderately effective organizational and presentational skills.					
	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. Limited ability to use information from sources to draw appropriate conclusions. Contribute only in a limited way to fruitful and meaningful class discussions. Apply limited or barely effective organizational and presentational skills.				
	Fail  Demonstrate evidence of little or no grasp of the knowledge and understanding of the subject. E lack of analytical and critical abilities, logical and coherent thinking. Misuse of information frou unable to draw appropriate conclusions. Make little or no meaningful contributions to class discuss and presentational skills are minimally effective or ineffective.				rom sources and/o	
Course Type	Lecture-l	pased course				
Course Teaching	Activitie		Details		No. of Hour	
& Learning Activities	Lectures				3	
	Tutorials				1	
	Reading / Self study				10	
	Methods Details					
Assessment Methods and Weighting	Method	s	Details		eighting in fina ourse grade (%	
	<b>Method</b> Examina		Details		eighting in fina ourse grade (%	

Required/recommended reading and online materials	To be decided by the course instructor. H. Eves and C.V. Newsom: An Introduction to the Foundations and Fundamental Concepts of Mathematics (Holt, Reinhart and Winston, 1958; 1990, 3rd edition) G. Polya: How to Solve It (Princeton University Press, 1971, 2nd edition) R. Laubenbacher and D. Pengelley: Mathematical Expeditions (Springer-Verlag, 1999) R. Calinger (ed.): Classic of Mathematics (Prentice Hall, preprinted 1995) C. Boyer: A History of Mathematics (Wiley, 1968; 1989, 2nd edition (with V.C. Merzbach)) V. Katz: A History of Mathematics (Harper Collins, 1993)
Course Website	http://hkumath.hkv.hk/course/MATH3001/

MATH3002 Mathematics s	seminar (6 credits)		Academic Yea	ar 2014		
Offering Department	Mathemati	CS	Quota	12		
Course Co-ordinator	Dr T W Ng	, Mathematics (ntw@maths.hku.hk)				
Teachers Involved		, Mathematics Cheung, Mathematics				
Course Objectives	mathemati then make prior to the	This is a seminar style course intended for those who have very strong interests and good ability in the nathematics. Students will be given book chapters and elementary research articles for private study and then make presentations in front of the whole class. Individual meetings with the instructors will be arranged rior to their presentations. Active participation in all the discussions is expected. The aim of the course is the students learn how to initiate self/independent study in mathematics.				
Course Contents & Topics	Topics cho	osen by the instructors, including chapt	ters from books and elementary researc	ch articles.		
Course Learning Outcomes		sful completion of the course, students rate independent study on some intere				
Pre-requisites (and Co-requisites and Impermissible combination)	Multivariab	MATH2012 Fundamental concepts of ole calculus and MATH2241 Introduction se is for second year BSc students onli		gebra I, MATH2211		
Offer in 2014 - 2015	Y 2nd	sem	Examination	May		
Offer in 2015 - 2016	Υ		<u>'</u>			
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.					
	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. Contribute only in a limited way to fruitful and meaningful class discussions. Apply limited or barely effective organizational and presentational skills.					
	Fail  Demonstrate evidence of 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. Make little or no meaningful contributions to class discussions. Organization and presentational skills are minimally effective or ineffective.					
Course Type	Project-ba	sed course				
Course Teaching & Learning Activities	Activities	<b>3</b>	Details	No. of Hours		
a Learning Activities	Meeting with supervisor		meeting of the whole class for two hours each teaching week	24		
	Reading /	Self study	individual meetings with the instructors	24		
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)		
	Research	Research report written examination coursework (70%)		100		
Course Website	http://hkun	nath.hku.hk/course/MATH3002/				
Additional Course Information	Enrollmen	t needs instructors' approval. This coul	rse is for second year BSc students onl	y.		

MATH3301 Algebra I (6	Academic Year	2014			
Offering Department	Mathematics				
Course Co-ordinator	Prof J H Lu, Mathematics (jhlu@maths.hku.hk)	Prof J H Lu, Mathematics (jhlu@maths.hku.hk)			
Teachers Involved	Prof J H Lu, Mathematics	Prof J H Lu, Mathematics			
Course Objectives	This course aims to present those fundamental topics and tec applications in mathematics and the applied sciences. It is comp Algebra II and Topics in Applied Discrete Mathematics.				

Course Contents & Topics	group hor Rings: ex factorizati Fields: de	Groups: examples of groups, subgroups, cosets, Lagrange theorem, quotient groups, normal subgroups, group homomorphisms, direct product of groups, group actions.  Rings: examples of rings, integral domains, ideals, fields of fractions, principal ideal domains, unique factorization domains.  Fields: definition and examples of fields.  Polynomials: polynomial rings in one variable over fields and over the integers, Gauss' lemma.				
Course Learning Outcomes	1. Write d 2. Give ex	ssful completion of the course, studen own the precise definitions of the basi camples for each of the concepts in the tand basic properties of groups, rings,	c concepts in the "Coee "Course Conents".	urse Conents".		
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in M	ATH2101 Linear algebra I				
Offer in 2014 - 2015	Y 1st	Y 1st sem Examination Dec			Dec	
Offer in 2015 - 2016	Υ	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 under applications, or not being able to complete t		le to identify appropr	iate theorems or their	
Course Type	Lecture-b	ased course				
Course Teaching	Activitie	s	Details		No. of Hours	
& Learning Activities	Lectures				36	
	Tutorials				12	
	Reading	/ Self study			100	
Assessment Methods and Weighting	Methods	·	Details		Weighting in final course grade (%)	
	Examina	tion			50	
	Test				50	
Required/recommended reading and online materials	S. Lang: l J.B. Frale I.N. Herst	To be decided by the course instructor. S. Lang: Undergraduate Algebra (Springer, 2004) J.B. Fraleigh: A First Course in Abstract Algebra (Addison-Wesley, 1989, 4th edition) I.N. Herstein: Abstract Algebra (Prentice-Hall, 1996) T.W. Hungerford: Abstract Algebra: An Introduction (Saunders College Publishing, 1990, 2nd edition)				
Course Website		math.hku.hk/course/MATH3301/	<u>,</u>	. 3, 44		

MATH3303 Matrix theory a	and its applications (6 credits)	Academic Year	2014		
Offering Department	Mathematics	Quota			
Course Co-ordinator	Dr M Young, Mathematics (myong @maths.hku.hk)				
Teachers Involved	Dr M Young, Mathematics				
Course Objectives	Matrix theory has a close connection with other mathematical subjects such as linear algebra, functional analysis, and combinatorics. It also plays an important role in the development of many subjects in science, engineering, and social sciences. In this course, students will be taught the fundamentals of matrix analysis and its application to various kinds of practical problems. Mathematical software may be used in the course, so that students can learn how to use the computer to solve matrix problems.				
Course Contents & Topics	Eigenvalues and eigenvectors: similarities, applications on difference equations and differential equations Orthogonality: inner products and the induced norms, orthogonality of null spaces and column spaces applications to over- or under-determined systems, least squares fit. Unitary, normal, and hermitian matrices: Schur's triangularization theorem. Variational description of eigenvalues: applications in optimization and in eigenvalue estimation. Singular value decomposition: polar decomposition, pseudo inverse, spectral norm of matrices, interlacing inequalities for singular values. Jordan form and applications.				
Course Learning Outcomes	On successful completion of the course, students should be able to:  1. Have a good understanding on matrices, determinants, linear transformations, eigenvalues are eigenvectors.  2. Understand the concept of similar matrices and the eigenvalue decomposition.  3. Understand the concept of orthogonality.				
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	<ol><li>Find the decompose</li></ol>	tand the concept of unitary, normal, ar e singular value decomposition of a m sition, pseudo inverse and spectral nor stand the concept of the Jordan bloc	natrix and apply the the matrices.	, ,		
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in M	ATH2101 Linear algebra I and MATH2	2102 Linear algebra II			
Offer in 2014 - 2015	Y 1st	sem		Examination	Dec	
Offer in 2015 - 2016	Υ					
Course Grade	A+ to F	u+ 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 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 their applications, or not being able to complete the solution.				
Course Type	Lecture-ba	ased course				
Course Teaching	Activitie	s	Details		No. of Hours	
& Learning Activities	Lectures				36	
	Tutorials				12	
	Reading	/ Self study			100	
Assessment Methods and Weighting	Methods	3	Details		Weighting in final course grade (%)	
	Examina	tion			50	
	Test				50	
Required/recommended reading and online materials	Steven J. Chris Rorr Roger A.	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 - Ha				
Course Website	http://hkur	math.hku.hk/course/MATH3303/				

MATH3304 Introduction to	number theory (6 credits)	Academic Year	2014		
Offering Department	Mathematics	Quota			
Course Co-ordinator	Prof K M Tsang, Mathematics (kmtsang@maths.hku.hk)				
Teachers Involved	Prof K M Tsang, Mathematics				
Course Objectives	To provide students with basic concepts about numbers, their properties and the arithmetic of congruences. The prime numbers are the basic building blocks of all the natural numbers under multiplication. The interplay between the multiplicative and additive properties of prime numbers is particularly interesting. The course will study further properties and the distribution of the prime numbers, and some of the longstanding open problems concerning them. Important applications of number theory to modern cryptography will also be introduced.				
Course Contents & Topics	The course will begin with some basic notions in number theory, including divisibility, greatest common 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 Little theorem, quadratic residues and the quadratic reciprocity law. Many well-known folklore open problems will also be introduced. Application of number theory to public key cryptography will be explained. Basic properties and some research on the prime numbers will be discussed. Then depending on the time remaining, the course will cover a selection of further topics, such as the prime number theorem, sum of squares, Dirichlet's theorem on diophantine approximations, etc.				
Course Learning Outcomes	On successful completion of the course, students should be able to:  1. Solve a system of linear congruences. 2. Solve polynomial congruences. 3. Determine the solubility of quadratic congruences by computation of Legendre symbols. 4. Determine the existence of primitive roots and use them in solving some exponential congruences. 5. Understand the prime number theorem. 6. Understanding some longstanding problems in number theory.				
Pre-requisites	Pass in MATH2101 Linear algebra I, MATH2102 Linear algebra II, M	IATH2211 Multivarial	ble calculus and		
	161				

(and Co-requisites and Impermissible combination)		41 Introduction to mathemation MATH3301 Algebra I, or alrea				
Offer in 2014 - 2015	Y 2n	d sem		Examination	May	
Offer in 2015 - 2016	Y			·		
Course Grade	A+ to F					
Grade Descriptors	Α	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.				
	В	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 in arguments and being able to present coherent logical reasoning and carry out computations carefully without major 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 weak and fragmentary argument and presentation, or with moderate computational errors.				
	D	Demonstrate some superficial understanding of key concepts and ideas by being able to correctly identify appropriate theorems, but with substantial inadequacies in applying the theorems through incorrectly analysing problems with poor argument or presentation, or with substantial computational errors.				
	Fail	Fail  Demonstrate poor and inadequate understanding of the key concepts and ideas by not being able to identify appropriate theorems or their applications, or not being able to complete the solution.				
Course Type	Lecture-b	ased course				
Course Teaching	Activitie	es	Details		No. of Hours	
& Learning Activities	Lectures				36	
	Tutorials				12	
	Reading / Self study				100	
Assessment Methods and Weighting	Method	S	Details		Weighting in final course grade (%)	
	Examina	ation			50	
	Test				50	
Required/recommended reading and online materials	T.M. Apo	Burton, Elementary Number ostol, Introduction to Analytic A Concise Introduction to the	Number Theory, Springer I	nternational Student Ed	dition.	
Course Website	http://hku	math.hku.hk/course/MATH33	304/			

MATH3401 Analysis I (6 credits)			Academic Year	2014		
Offering Department	Mathemati	cs	Quota			
Course Co-ordinator	Prof W S C	Prof W S Cheung, Mathematics (wscheung @maths.hku.hk)				
Teachers Involved	Prof W S C	Cheung, Mathematics				
Course Objectives		This course extends to more general situations some basic results covered in Calculus and introduce some fundamental concepts which are essential for advanced studies in mathematical analysis.				
Course Contents & Topics	Basic properties of metric spaces; openness; closedness; interior point; adherent point; accumulation point; boundary point; compactness; completeness; continuity; connectedness; pathwise connectedness uniform continuity; uniform convergence; Banach's fixed point theorem.					
Course Learning Outcomes	1. Demons topology (e 2. Apply kr a critical was 3. Think cr	sful completion of the course, students should be able to strate knowledge and understanding of the basic features e.g., able to identify objects that are topological equivalent nowledge and skills acquired in mathematical analysis to ay (e.g., able to determine whether a specific function is eatively and laterally to generate innovative examples a to provide counterexamples to inaccurate mathematical strategy.	of mathematical ana t). analyze and handle uniformly continuous; nd solutions to non-s	novel situations		
Pre-requisites and Co-requisites and mpermissible combination)	Pass in MA	ATH2211 Multivariable calculus				
Offer in 2014 - 2015	Y 1st s	sem	Examination	Dec		
Offer in 2015 - 2016	Υ		'	-		
Course Grade	A+ to F					
Jourse Grade						
	A	Demonstrate a thorough understanding of all concepts and ideas by various concepts and apply the theorems through correctly analyst correct logical reasoning and argumentation, and with some innovation.	ing problems, clearly and	l elegantly presenting		
	В	various concepts and apply the theorems through correctly analysis	ing problems, clearly and we approaches to solving p being able to identify the with some minor inadeq	l elegantly presenting problems.		
Grade Descriptors		various concepts and apply the theorems through correctly analyst correct logical reasoning and argumentation, and with some innovation. Demonstrate a good understanding of key concepts and ideas by and their applications through correctly analysing problems, but	ing problems, clearly and ve approaches to solving pubeing able to identify the with some minor inadeq entation.	I elegantly presenting problems.  appropriate theorem- uacies in arguments tly identify appropriate		

		theorems, but with substantial inade poor argument or presentation.	equacies in applying the theorems thro	ough incorrectly analysing problems with
	Fail	Demonstrate poor and inadequate applications, or not being able to cor		identify appropriate theorems or their
Course Type	Lecture-ba	Lecture-based course		
Course Teaching & Learning Activities	Activities	s	Details	No. of Hours
	Lectures			36
	Tutorials			12
	Reading / Self study			100
Assessment Methods and Weighting	Methods	•	Details	Weighting in final course grade (%)
	Examination			50
	Test			50
Required/recommended reading and online materials		Mathematical Analysis nciples of Mathematical Analysi	s	
Course Website	http://hkur	math.hku.hk/course/MATH3401/		

MATH3403 Functions of a	complex v	ariable (6 credits)		Academic Year	2014	
Offering Department	Mathemat	rics	(	Quota		
Course Co-ordinator	Prof N Mo	k, Mathematics (nmok@hku.hk)				
Teachers Involved	Prof N Mo	k, Mathematics				
Course Objectives	of physics analytic fu	se is indispensable for studies in high s. In this course, the students are in sunctions and are shown how to look a ques of solving problems without losi	introduced to the fundar at analyticity from differe	nental concepts and points of view.	and properties of At the same time	
Course Contents & Topics	Cauchy's	number system. Analytic functions a theorem and its applications. Taylor's heorem and its applications.				
Course Learning Outcomes	1. Recognimathematical 2. Grasp formulas to 3. Compute 4. Apply states to the states of the states o	On successful completion of the course, students should be able to:  1. Recognize the theory of functions of a complex variable as a rigorous and foundational subject in mathematics. 2. Grasp the techniques from Cauchy-Riemann equations, power series expansion and Cauchy integral formulas to study analytic functions from different perspectives. 3. Compute contour integrals by calculating residues. 4. Apply such techniques to determine improper integrals such as those for certain rational functions on the real line.				
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in M	ATH2211 Multivariable calculus and	MATH2241 Introduction	to mathematical a	nalysis	
Offer in 2014 - 2015	Y 1st	sem	E	Examination	Dec	
Offer in 2015 - 2016	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.					
	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 applications, or not being able to complete the solution.				e theorems or their	
	Fail			,,,		
Course Type						
Course Teaching		applications, or not being able to complete ased course				
Course Teaching	Lecture-b	applications, or not being able to complete ased course	the solution.		No. of Hours	
Course Teaching	Lecture-b	applications, or not being able to complete ased course	the solution.		No. of Hours	
Course Type Course Teaching & Learning Activities	Lecture-b.  Activitie Lectures Tutorials	applications, or not being able to complete ased course	the solution.		No. of Hours 36 12 100	

		course grade (%)
	Examination	50
	Test	50
Required/recommended reading and online materials	E.C. Titchmarsh: The Theory of Functions (OUP) L.V. Ahlfors: Complex Analysis (McGraw-Hill, 3rd edition) J. Bak & D.J. Newman: Complex Analysis, Undergraduate Texts K. Kodaira: Introduction to Complex Analysis (Cambridge)	in Mathematics (Springer-Verlag)
Course Website	http://hkumath.hku.hk/course/MATH3403/	

MATH3405 Differential equ	uations (6 c	redits)		Academic Year	2014	
Offering Department	Mathemati	cs		Quota		
Course Co-ordinator	Dr C W W	ong, Mathematics (cwwongab@hk	u.hk)			
Teachers Involved	Dr C W W	ong, Mathematics				
Course Objectives	importance	ard topics in the wide field of ordin e to students of sciences and en s and our approach is a compromi	gineering. Our emphasi	s is on principles r		
Course Contents & Topics	differential	f elementary differential equatio equations, Wronskian, variation o actions. Linear systems, autonomo	of parameters. Power s	eries method, Lege	endre polynomials	
Course Learning Outcomes	On succes	sful completion of the course, stud	ents should be able to:			
	auxiliary ed 2. Solve sand the nu 3. Discuss linear appid. Apply the	<ol> <li>Solve simple first order and second order (linear or nonlinear) ODEs by various techniques, includin auxiliary equations, variation of parameters, Laplace transform, and series method.</li> <li>Solve systems of first order linear ODEs with constant coefficients, of which the number of equation and the number of unknown functions are no more than three.</li> <li>Discuss qualitatively the solutions of nonlinear ODEs or systems of nonlinear ODEs by studying the linear approximations or their phase diagrams.</li> <li>Apply the theory of differential equations to study quantitatively/qualitatively problems from physical an life sciences.</li> </ol>				
Pre-requisites (and Co-requisites and Impermissible combination)		IATH2101 Linear algebra I and M/ or actuarial science I and MATH28:				
Offer in 2014 - 2015	Y 2nd	sem		Examination	May	
Offer in 2015 - 2016	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 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 appropriat 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 their applications, or not being able to complete the solution.				
Course Type	Lecture-ba	ased course				
Course Teaching	Activities	<b>3</b>	Details		No. of Hours	
& Learning Activities	Lectures				36	
	Tutorials				12	
	Reading /	Self study			100	
Assessment Methods and Weighting	Methods		Details		Weighting in fina course grade (%	
	Examinat	ion			50	
	Test				50	
Required/recommended reading and online materials	R. Nagle, (Pearson, W.E. Boyo Wiley, 6th	E. Staff and A. Snider, Fundamer 6th edition) ce and R.C. DiPrima: Elementary edition) ington: An Introduction to Ordinary	Differential Equations a	and Boundary Valu	ry Value Problems	
	L.A. 0000	ington. An introduction to Ordinary	Dinerential Equations (I	i ioiiuo <del>o-</del> iiaii)		

MATH3408 Computationa applications (6 credits)	al methods	and differential equations with	Academic Year	2014		
Offering Department	Mathema	tics	Quota			
Course Co-ordinator	Dr C W W	ong, Mathematics (cwwongab@hku.hk)				
Teachers Involved	Dr C W W	ong, Mathematics				
Course Objectives		se covers topics in the fields of differential eque to sciences students. The emphasis is practical				
Course Contents & Topics	differentia	I differentiation and integration. Solution of nor I equations. Power series method. Numerical Numerical solutions of systems of first-order ordi	solutions of ordinary and			
Course Learning Outcomes	On succe	ssful completion of the course, students should be	able to:			
	solution o 2. Explair 3. Construction ordinary of properties 4. Construction analyze the	<ol> <li>Construct and implement numerical methods for numerical integration and differentiation, and the solution of nonlinear system of equations.</li> <li>Explain mathematical ideas of numerical methods in solving ordinary and partial differential equations.</li> <li>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.</li> <li>Construct finite difference methods for the numerical solution of partial differential equations and analyze their stability and accuracy properties.</li> <li>Implement numerical methods for solving initial and boundary value problems by software packages like Scilab.</li> </ol>				
Pre-requisites (and Co-requisites and Impermissible combination)		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)				
Offer in 2014 - 2015	Y 2nd	d sem	Examination	May		
Offer in 2015 - 2016	Υ					
Course Grade	A+ to F					
Grade Descriptors	В	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.				
	С	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					
	∣Fail	Demonstrate poor and inadequate understanding by	not being able to identify appro	priate theorems and		
	Fail	Demonstrate poor and inadequate understanding by computational methods or their applications, or not being a		priate theorems and		
Course Type				priate trieorems and		
Course Teaching		computational methods or their applications, or not being a ased course				
Course Teaching	Lecture-b	computational methods or their applications, or not being a assed course  Details		No. of Hours		
Course Teaching	Lecture-b	computational methods or their applications, or not being a assed course  Details		No. of Hours		
Course Teaching	Lecture-b  Activitie Lectures Tutorials	computational methods or their applications, or not being a assed course  Details		<b>No. of Hours</b> 36		
Course Teaching & Learning Activities  Assessment Methods	Lecture-b  Activitie Lectures Tutorials	computational methods or their applications, or not being a ased course   Details  / Self study	ble to complete the solution.	No. of Hours 36 12 100 Weighting in final		
Course Teaching & Learning Activities  Assessment Methods	Lecture-b  Activitie  Lectures  Tutorials  Reading	computational methods or their applications, or not being a assed course  S	ble to complete the solution.	No. of Hours 36 12 100 Weighting in final course grade (%)		
Course Type Course Teaching & Learning Activities  Assessment Methods and Weighting	Lecture-b  Activitie  Lectures  Tutorials  Reading  Methods	computational methods or their applications, or not being a assed course  S	ble to complete the solution.	No. of Hours 36 12 100 Weighting in final course grade (%)		
Course Teaching & Learning Activities  Assessment Methods	Lecture-b  Activitie Lectures Tutorials Reading  Methods  Examina Test  D.F. Park E.A. Code	computational methods or their applications, or not being a assed course  S	vironmental Science (Springe quations (Prentice-Hall)	No. of Hours 36 12 100 Weighting in final course grade (%) 50		

MATH3600 Discrete math	Academic Year	2014					
Offering Department	Mathematics	Quota					
Course Co-ordinator	Prof W Zang, Mathematics (wzang@maths.hku.hk)						
Teachers Involved	Prof W Zang, Mathematics						
Course Objectives	To introduce students to the basic ideas and techniques of discrete m	To introduce students to the basic ideas and techniques of discrete mathematics.					
Course Contents & Topics	- Counting: combinations, permutations, pigeonhole principle, inclusion-exclusion, recurrence relations, and generating functions - Graph theory: paths, circuits, trees, connectivity, planarity, etc.						
	160						

	- Applicati	ions of counting technique	s and graph theory				
Course Learning Outcomes	On successful completion of the course, students should be able to:  1. Demonstrate knowledge and understanding of the basic ideas and techniques of discrete mathematics.  2. Solve various real-world problems by using counting techniques and graph theory.  3. Develop their ability to read, comprehend, and create mathematical arguments.						
Pre-requisites (and Co-requisites and Impermissible combination)	Calculus any 1 of	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 (MATH1821 Mathematical methods for actuarial science I and MATH2822 Mathematical methods for actuarial science II)					
Offer in 2014 - 2015	Y 1st	sem		Examination	Dec		
Offer in 2015 - 2016	Υ			'	'		
Course Grade	A+ to F						
Grade Descriptors	Α	theorems and their applicatio	nderstanding of key concepts and ns through correctly analysing proble n and being able to carry out com ving problems.	ms, clearly and elegantly p	resenting correct logical		
	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.					
	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 Demonstrate poor and inadequate understanding by not being able to identify appropriate theorems or their applications, or not being able to complete the solution.						
Course Type	Lecture-b	ased course					
Course Teaching	Activitie	s	Details		No. of Hours		
& Learning Activities	Lectures				36		
	Tutorials				12		
	Reading	Reading / Self study			100		
Assessment Methods and Weighting	Methods	3	Details		Weighting in final course grade (%)		
	Examina	tion			50		
	Test	Test					
Required/recommended reading and online materials	K H Rose NIL	n: Discrete Mathematics a	nd its Applications (McGraw-F	Hill, 2007)			
Course Website	http://hkui	math.hku.hk/course/MATH	3600/				

MATH3601 Numerical ana	lysis (6 cre	redits)				Academic Year	2014	
Offering Department	Mathema	atics				Quota		
Course Co-ordinator	Dr M Y Y	Yim, Mathe	matics (myyim@	hku.hk)				
Teachers Involved	Dr M Y Y	Dr M Y Yim, Mathematics						
Course Objectives		This course covers both the theoretical and practical aspects of numerical analysis. Emphasis will be on basic principles and numerical methods of solution, using high speed computers.						
Course Contents & Topics		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	<ol> <li>Constr and fixed</li> <li>Constr</li> <li>Constr</li> <li>Apply t</li> <li>Solve i</li> </ol>	On successful completion of the course, students should be able to:  1. Construct and implement algorithms to find the zeros of functions, apply the bisection, Newton, secant and fixed point iteration methods.  2. Construct and implement Newton's method to find the roots of a system of nonlinear equations.  3. Construct interpolation polynomials in Lagrange, Newton, Hermit and spline forms.  4. Apply the basic numerical integration and differentiation methods.  5. Solve initial value problems using Taylor series and Runge-Kutta methods of varying orders.  6. Use software package such as Scilab to solve numerical problems.						
Pre-requisites (and Co-requisites and Impermissible combination)		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)						
Offer in 2014 - 2015	Y 1st	st sem				Examination	Dec	
Offer in 2015 - 2016	Υ						·	
Course Grade	A+ to F							
Grade Descriptors	A					nods by being able to ideng problems, clearly and		

		correct logical reasoning and argumentation and being able to carry out numerical procedures carefully and correctly, and with some innovative approaches to solving problems.					
	В	Demonstrate a good understanding of ki theorems/algorithms and their applications in arguments, identifying the appropriate alg	through correctly analysing probl	lems, but with some minor inadequacies			
	С	Demonstrate an acceptable understandin appropriate theorems/algorithms, but with sanalysing problems with poor argument and	ome inadequacies in applying th	e theorems/methods through incorrectly			
	D	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.					
	Fail	Demonstrate poor and inadequate underst their applications, or not being able to comp		ntify appropriate theorems/algorithms or			
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 (%)			
	Examination			50			
	Test			50			
Required/recommended reading and online materials	A. Ralsto	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://hk	umath.hku.hk/course/MATH3601/					
Additional Course Information	Knowled	lge of a programming language is requi	red.				

ATH3603 Probability theory (6 credits)			Academic Y	ear	2014		
Offering Department	Mathemati	3	Quota				
Course Co-ordinator	Dr G Han,	athematics (ghan@maths.hku.hk)					
Teachers Involved	Dr G Han,	athematics					
Course Objectives	elucidate t	The emphasis of this course will be on probability models and their applications. The primary aim is t elucidate the fundamental principles of probability theory through examples and to develop the ability of the students to apply what they have learned from this course to widely divergent concrete problems.					
Course Contents & Topics	distribution Bayes' The Poisson concepts of Markov of application	- Basic probability theory and decision theory: discrete probability distributions, continuous probability distributions, conditional probability, expectation, variance, moment generating function, limit theorems Bayes' Theorem, decision analysis, decision tree method - Poisson process and reliability theory: exponential distribution, Markov property, Poisson process, concepts of reliability, components in series, components in parallel, maintenance models - Markov chain theory: concepts of states and transition probability, irreducibility, stationary distribution applications 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 the course, students should be able to:  1. Understand the fundamental principles of probability theory.  2. Explain the typical proofs and computational techniques in probability theory and apply them to concret problems.  3. Demonstrate knowledge and understanding of various types of probability models.						
		ate knowledge and understanding of various	types of probability models	i.			
and Co-requisites and	3. Demons	ate knowledge and understanding of various t TH2101 Linear algebra I and MATH2211 Mu actuarial science I and MATH2822 Mathemat	ltivariable calculus) or (M/	TH18			
and Co-requisites and mpermissible combination)	3. Demons	TH2101 Linear algebra I and MATH2211 Mu actuarial science I and MATH2822 Mathemat	ltivariable calculus) or (M/	ATH18 scien			
and Co-requisites and mpermissible combination) Offer in 2014 - 2015	3. Demons Pass in (N methods fo	TH2101 Linear algebra I and MATH2211 Mu actuarial science I and MATH2822 Mathemat	Itivariable calculus) or (Maical methods for actuarial	ATH18 scien	ce II)		
and Co-requisites and mpermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016	3. Demons Pass in (Methods for Y 1st)	TH2101 Linear algebra I and MATH2211 Mu actuarial science I and MATH2822 Mathemat	Itivariable calculus) or (Maical methods for actuarial	ATH18 scien	ce II)		
and Co-requisites and mpermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade	3. Demons Pass in (M methods fo	TH2101 Linear algebra I and MATH2211 Mu actuarial science I and MATH2822 Mathemat	Examination  epts and ideas by being able ing problems, clearly and elegar	ATH18 sciend	Dec ntify the appropria		
and Co-requisites and mpermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade	3. Demons Pass in (N methods for Y 1st: Y A+ to F	TH2101 Linear algebra I and MATH2211 Mu actuarial science I and MATH2822 Mathemat m  Demonstrate an excellent understanding of key concitheorems and their applications through correctly analysi reasoning and argumentation and being able to carry	Itivariable calculus) or (Maical methods for actuarial  Examination  epts and ideas by being able ing problems, clearly and elegar out computations carefully and ideas by being able to identifiblems, but with some minor in	ATH18 science to identify pressing correctly the adequate adequate the	Dec  http://dec.mit.gov.ore.clip.clip.clip.clip.clip.clip.clip.clip		
and Co-requisites and mpermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade	3. Demons Pass in (No methods for Y 1st: Y A+ to F	TH2101 Linear algebra I and MATH2211 Mu actuarial science I and MATH2822 Mathemat m  Demonstrate an excellent understanding of key concepte or many and their applications through correctly analysing reasoning and argumentation and being able to carry innovative approaches to solving problems.  Demonstrate a good understanding of key concepts an and their applications through correctly analysing pro	Examination  Epts and ideas by being able ing problems, clearly and elegar out computations carefully and ideas by being able to identification or with some minor in and presentation or with some repts and ideas by being able to theorems through incorrectly and theorems through incorrectly and ideas by being able to theorems through incorrectly and ideas by being able to theorems through incorrectly and ideas by being able to theorems through incorrectly and ideas by being able to theorems through incorrectly and ideas by being able to the core in the	to ider	Dec  https://www.mtg.ace.org.com/mtg/propriate decires in argument omputational errors y identify appropriate y identify appropriate organizational errors or identify appropriate organizational errors or identify appropriate organizational errors or identify appropriate organizational errors or identify appropriate organizational errors or identify appropriate organization or identify appropriate organization or identify appropriate organization or identify appropriate organization or identify appropriate organization or identify appropriate organization or identify appropriate organization or identification or ident		
Pre-requisites (and Co-requisites and (impermissible combination)  Offer in 2014 - 2015  Offer in 2015 - 2016  Course Grade  Grade Descriptors	3. Demons Pass in (Monethods for Young 1st) Y 1st: Y A+ to F  A  B	TH2101 Linear algebra I and MATH2211 Mu actuarial science I and MATH2822 Mathemat m  Demonstrate an excellent understanding of key conce theorems and their applications through correctly analysis reasoning and argumentation and being able to carry innovative approaches to solving problems.  Demonstrate a good understanding of key concepts an and their applications through correctly analysing pro identifying the appropriate theorems or their applications  Demonstrate an acceptable understanding of key conce theorems, but with some inadequacies in applying the	Examination  Exami	to identify to identify the adequation of correctly alysing	Dec  Intify the appropria senting correct logically, and with son appropriate theorer acies in argument omputational errors by identify appropria g problems with po- identify appropria		

	applications, or not being able to complete the solution.					
Course Type	Lecture-based course					
Course Teaching & Learning Activities	Activities	Details	No. of Hours			
	Lectures		36			
	Tutorials		12			
	Reading / Self study		100			
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)			
	Examination		50			
	Test		50			
Required/recommended reading and online materials	S.M. Ross: Introduction to Probability Models (Academic Press, 2007, 9th ed.)					
Course Website	http://hkumath.hku.hk/course/MATH	13603/				

MATH3901 Operations res	search i (6				2014			
Offering Department	Mathema	tics		Quota				
Course Co-ordinator	Prof S C	Prof S C K Chu, Mathematics (schu@hku.hk)						
Teachers Involved	Prof S C	K Chu, Mathematics						
Course Objectives	programn aspects	The objective is to provide a fundamental account of the basic results and techniques of linear programming (LP) and its related topics in operations research. There is an equal emphasis on all three aspects of understanding, algorithms and applications. The course serves, together with a course on network models, as essential concept and background for more advanced studies in operations research.						
Course Contents & Topics	Linear Pr	ogramming. Matrix game. Goal p	rogramming.					
Course Learning Outcomes	1. Understudy of c 2. Demorextension	On successful completion of the course, students should be able to:  1. Understand the fundamental concept and approach of linear programming appropriate to the further study of operations research.  2. Demonstrate knowledge and understanding of the underlying techniques of the Simplex Method and its extensions such as the revised Simplex and dual Simplex algorithms.  3. Understand and apply the theory of LP duality such as in the theory and computations of matrix games.						
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in M	1ATH2101 Linear algebra I or MA	TH2102 Linear algebra II					
Offer in 2014 - 2015	Y 1st	sem		Examination	Dec			
Offer in 2015 - 2016	Y							
Course Grade	A+ to F							
Grade Descriptors	В	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.						
	C	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.  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 not being able to identify basic principles, appropriate theorems, algorithms or their applications, or not being able to complete or compute the solution.							
Course Type	Lecture-b	ased course						
Course Teaching & Learning Activities	Activitie	es	Details		No. of Hours			
a Louining Addivides	Lectures	;			36			
	Tutorials				12			
	Reading	/ Self study			100			
Assessment Methods and Weighting	Methods	S	Details		Veighting in fina course grade (%			
	Examina	ition			50			
	Test				50			
		io and T.M. Cavalier: Linear Prog						

reading and online materials	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	optimizati	on (6 credits)		Academic Year	2014			
Offering Department	Mathemat	iics		Quota				
Course Co-ordinator	Prof W Za	ing, Mathematics (wzang@maths.hku.h	k)					
Teachers Involved	Prof W Za	ing, Mathematics						
Course Objectives		This course introduces students to the theory and techniques of optimization, aiming at preparing them for further studies in operations research, mathematical economics and related subject areas.						
Course Contents & Topics		Unconstrained and constrained optimization, necessary conditions and sufficient conditions for optimality, convexity, duality. Algorithms and numerical examples.						
Course Learning Outcomes	On succes	ssful completion of the course, students	should be able to:					
	2. Solve v 3. Unders	Demonstrate knowledge and understanding of the basic theory and techniques of optimization.     Solve various optimization problems encountered in practice.     Understand the connection between the purely analytical character of an optimization problem and the behavior of algorithms for solving it.						
Pre-requisites (and Co-requisites and Impermissible combination)		MATH2101 Linear algebra I and MATH2 for actuarial science I and MATH2822 M						
Offer in 2014 - 2015	Y 2nd	d sem		Examination	May			
Offer in 2015 - 2016	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  Demonstrate poor and inadequate understanding by not being able to identify appropriate theorems or their applications, or not being able to complete the solution.							
Course Type	Lecture-ba	ased course						
Course Teaching	Activities	s	Details		No. of Hours			
& Learning Activities	Lectures				36			
	Tutorials				12			
	Reading	/ Self study			100			
Assessment Methods and Weighting	Methods		Details		Weighting in final course grade (%)			
	Examina	tion			50			
	Examinat Test	tion						
	Test	s lecture notes			50			

MATH3905 Queueing theor	Academic Year	2014				
Offering Department	Mathematics Quota					
Course Co-ordinator	Prof W K Ching, Mathematics (wching@hku.hk)					
Teachers Involved	Prof W K Ching, Mathematics					
Course Objectives	This course introduces students to the models and theory of queueing system, as well as the technique of simulation as a practical tool of analysis.					
Course Contents & Topics	Markov, birth-and-death, and Poisson processes, exponential models. Markovian queueing networks. Imbedded Markov-chain queueing models. Simulation of queueing models and discrete-event systems.					
Course Learning Outcomes	On successful completion of the course, students should be able to:					

	<ol> <li>Demor</li> <li>Formu</li> </ol>	<ol> <li>Understand the terminology and nomenclature appropriate to queueing theory.</li> <li>Demonstrate knowledge and understanding of various queueing models.</li> <li>Formulate concrete problems using queueing theoretical approaches.</li> <li>Become familiar with fundamental principles of simulation and compare different simulation techniques</li> </ol>					
Pre-requisites (and Co-requisites and Impermissible combination)	methods	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)					
Offer in 2014 - 2015	N	Examination					
Offer in 2015 - 2016	Υ						
Course Grade	A+ to F						
Grade Descriptors	Α	and their applications th	understanding of key concepts and ic rough correctly analysing problems, ation and being able to carry out co ative approaches.	clearly and elegantly presi	enting correct logical		
	В	their applications through	erstanding of key concepts and ideas correctly analysing problems, but with or their applications and presentation of	some minor inadequacies in	arguments, identifying		
	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		nadequate understanding by not beinable to complete the solution.	ng able to identify appropria	ate theorems or their		
Course Type	Lecture-b	pased course					
Course Teaching	Activitie	es	Details		No. of Hours		
& Learning Activities	Lectures	3			36		
	Tutorials	S			12		
	Reading	Reading / Self study			100		
Assessment Methods and Weighting	Method	s	Details		Weighting in final course grade (%)		
	Examina	ation			50		
	Test				50		
Required/recommended reading and online materials	S.M. Ros		ueing Theory (Edward Arnold, 1 illity Models (Academic Press, n (Macmillan, 1991)				
Course Website	http://hku	ımath.hku.hk/course/MA	TH3905/				

MATH3906 Financial calcu	ilus (6 credi	its)			Academic Year	2014		
Offering Department	Mathematic	Mathematics			Quota			
Course Co-ordinator	Dr C W Wo	Dr C W Wong, Mathematics (cwwongab@hku.hk)						
Teachers Involved		Dr C W Wong, Mathematics Dr S P Yung, Mathematics						
Course Objectives	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	contracts.	An introduction to financial instruments: stocks, bonds, foreign exchange, options, forward and future contracts. Asset pricing: risk neutral relationship, no arbitrage principle. Brownian motion, stochastic calculus, Ito's Lemma, Black-Scholes model and its pricing partial differential equation. Variations on the Black-Scholes model: American options, path dependent options. Numerical binomial tree method.						
Course Learning Outcomes	1. Understathe no-arbition 2. Demons 3. Describe 4. Implement	sful completion of the cand the terminology are trage-principle. trate knowledge on using basic properties of a land stochastic calculus in various type of option	nd nature of bonds, in ing binomial tree mod Brownian motion and (such as Ito's Lemm	nterest rates, fo lels to find optio the Black-Scho a) to derive Bla	on prices via the risk ples stock price mod ack-Scholes pricing	k-neutral concept del. partial differentia		
Pre-requisites (and Co-requisites and Impermissible combination)	methods fe	ATH2101 Linear algeb or actuarial science I Probability and statisti	and MATH2822 M					
Offer in 2014 - 2015	Y 1st s	sem			Examination	Dec		
Offer in 2015 - 2016	Υ							
Course Grade	A+ to F							
Grade Descriptors	Α	Demonstrate an excellen	t understanding of key o	oncents and ideas	s by being able to ide	ntify the appropriate		

		theorems and their applications through co reasoning and argumentation and being innovative approaches to solving problems	able to carry out computations		
	В	Demonstrate a good understanding of key their applications through correctly analysis the appropriate theorems or their application	ng problems, but with some mind	r inadequacies in arguments, identifying	
	С	Demonstrate an acceptable understanding theorems, but with some inadequacies in argument and presentation or a number of	applying the theorems through in		
	D Demonstrate some understanding of key concepts and ideas by being able to correctly ide theorems, but with substantial inadequacies in applying the theorems through incorrectly analysi poor argument or presentation or with substantial computational errors.				
	Fail	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-l	pased course			
Course Teaching	Activities		Details	No. of Hours	
& Learning Activities	Lectures			36	
	Tutorials			12	
	Reading / Self study			100	
Assessment Methods and Weighting	Method	s	Details	Weighting in final course grade (%)	
	Examination			50	
	Test			50	
Required/recommended reading and online materials	A. Etheridge: A Course in Financial Calculus (Cambridge University Press) M. Baxter and A. Rennie: Financial Calculus: An Introduction to Derivative Pricing (Cambridge University Press, 1996) P. Wilmott, S. Howison, J. Dewynne: The Mathematics of Financial Derivatives (Cambridge University Press, 1995) R. Jarrow, S. Turnbull: Derivative Securities (South-Western College Publishing, 1994)			ve Pricing (Cambridge University erivatives (Cambridge University	
Course Website	http://hku	umath.hku.hk/course/MATH3906/			

MATH3911 Game theory a	nd strateg	yy (6 credits)	Academic Year	2014		
Offering Department	Mathema	atics	Quota			
Course Co-ordinator	Dr K H L	aw, Mathematics (lawkaho@maths.hku.hk)	<u>'</u>	·		
Teachers Involved	Dr K H L	aw, Mathematics				
Course Objectives		Game theory is the logical analysis of situations of conflict and cooperation. This course will introduce the students to the basic ideas and techniques of mathematical game theory in an interdisciplinary context.				
Course Contents & Topics	theorem; form; Sh	torial games and Zermelo's Theorem; Prisonner's D mixed Nash equilibria; application to biology: evolu- napley value; application to politics: Shapley-Shul tern solution; bargaining set.	itionary stable strategies;	games in coalition		
Course Learning Outcomes	1. Under	On successful completion of the course, students should be able to:  1. Understand the basic terminology and solution concepts in game theory.  2. Compute explicitly different solution concepts for some simple cooperative and non-cooperative games  3. Apply game theoretical ideas and methods to solve some problems in economics and biology.				
Pre-requisites (and Co-requisites and Impermissible combination)		Pass in (MATH2101 Linear algebra I and MATH2211 Multivariable calculus) or (MATH1821 Mathematica methods for actuarial science I and MATH2822 Mathematical methods for actuarial science II)				
Offer in 2014 - 2015	Y 2n	d sem	Examination	May		
Offer in 2015 - 2016	Υ					
Course Grade	A+ to F					
Grade Descriptors	A Demonstrate an excellent understanding of key concepts and ideas of Game Theory by being able to idea appropriate theorems and their applications through correctly analysing problems, clearly and elegantly procured logical reasoning and being able to carry out computations carefully and correctly, and with some in approaches to solving problems.					
	В	Demonstrate a good understanding of key concepts and appropriate theorems and their applications through correctly in arguments, identifying the appropriate theorems or their computational errors.	analysing problems, but with sor	ne minor inadequacies		
	С	Demonstrate an acceptable understanding of key concepts and ideas of Game Theory by being able to correct identify appropriate theorems, but with some inadequacies in applying the theorems through incorrectly analysis problems with poor argument and presentation or a number of minor computational errors.				
	D					
	Fail  Demonstrate poor and inadequate understanding by not being able to identify appropriate theorems or their applications, or not being able to complete the solution.					

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 (%)
	Examination		50
	Test		50
Required/recommended reading and online materials	Robert J. Aumann, Lectures on Game Theory, Westview Press, 1989.		
Course Website	http://hkumath.hku.hk/course/MATH3	911/	

MATH3943 Network mode	eis in opera	ations research (o credits	<i>)</i>	Academic Year	2014	
Offering Department	Mathema	atics		Quota		
Course Co-ordinator	Prof W Z	ang, Mathematics (wzang@ma	nths.hku.hk)			
Teachers Involved	Prof W Z	ang, Mathematics				
Course Objectives	operation application	ctive is to provide a fundament ns research. There is an equal ons. The course serves, toget and background for more advar	l emphasis on all three a ther with a course on li	aspects of understandir near programming, to	ig, algorithms and	
Course Contents & Topics	problems algorithm	and algorithms. Trees, matchir s. Ford-Fulkerson network flow ns. Applications to combinate ing. Project networks, if time pe	theory and computation orial optimization proble	for maximum flow and i	minimum cost flow	
Course Learning Outcomes	On succe	essful completion of the course,	students should be able	to:		
	further st 2. Demo network a	estand the fundamental conceptudy of operations research. Instrate knowledge and underlagorithms and their extensions stand the theory of network flow	standing of the underlyin	ng techniques of the v	arious graph and	
Pre-requisites (and Co-requisites and Impermissible combination)		MATH2101 Linear algebra I and MATH3901 Operations research				
Offer in 2014 - 2015	Y 2n	Y 2nd sem Examination May				
Offer in 2015 - 2016	Υ	Y				
Course Grade	A+ to F					
Grade Descriptors	A	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.				
		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.				
	С	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 computationa errors.				
	D	Demonstrate some understanding theorems, algorithms and their a incorrectly analysing problems with	pplications but with substantia	Il inadequacies in applying t	ring the theorems through	
	Fail	Demonstrate poor and inadequate algorithms or their applications, or			appropriate theorems,	
Course Type	Lecture-b	pased course				
Course Teaching & Learning Activities	Activitie	es	Details		No. of Hours	
a Learning Activities	Lectures	3			36	
	Tutorials	Tutorials			12	
	Reading	g / Self study			100	
Assessment Methods and Weighting	Method	s	Details		Weighting in final course grade (%)	
	Examina	ation			50	
	Test				50	

reading and online materials	R.K. Ahuja, T.L. Magnanti and J.L. Orlin: Network Flows: Theory Algorithms, and Applications. (1993) H.A. Taha: Operations Research: an Introduction. (7/e 2003)
Course Website	http://hkumath.hku.hk/course/MATH3943/
Additional Course Information	TBC

MATH3999 Directed st				Academic Year		
Offering Department	Mathema			Quota		
Course Co-ordinator	Prof W K	Ching, Mathematics (wching@hku.hk)				
Teachers Involved	All teachi	Il teaching staff, Mathematics				
Course Objectives		rse is designed for students who would ent studies.	like to have earl	y experiences on	research related	
Course Contents & Topics	The stud	ect matter of the project will be determined be ent must achieve good standing and get the pordinator to take this course.				
Course Learning Outcomes	On succe	n successful completion of the course, students should be able to:				
outcomes	2. Unders	independently a topic that is not available in t stand how mathematical theories are applied xperience in project writing and oral presenta	and/or extended in			
Pre-requisites (and Co-requisites and Impermissible combination)	or MATH Linear alo to mather	It least 24 credits of advanced level compulso (6XXX) in the Mathematics, and Mathematic gebra I, MATH2102 Linear algebra II, MATH matical analysis. Stone course is for Mathematics, and Mathem	cs/Physics Majors, 2211 Multivariable	in addition to a p calculus and MAT	ass in MATH2101	
Offer in 2014 - 2015	Y 2n	d sem		Examination	No Exam	
Offer in 2015 - 2016	Υ	Y				
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 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	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	Demonstrate general but incomplete grasp of the subject. Evidence of some analytical and critical abilities and logical thinking. Use of relevant information from sources, showing ability to make comparisons between different interpretations and to reference aptly. Mostly correct but some erroneous use of data and results to draw appropriate conclusions. Apply moderately effective organizational and presentational skills.				
	D					
	Fail	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	Details		No. of Hours	
& Learning Activities	Reading	Reading / Self study  Reading & seminars  No. of Home independent work & to attend meetings & seminars				
Assessment Methods and Weighting	Methods	S	Details		Weighting in fina course grade (%	
	Disserta	tion	Written report presentation	plus oral	100	

MATH4302 Algebra II (6 cr	edits)	Academic Year	2014		
Offering Department	Mathematics Quota				
Course Co-ordinator	Prof J T Yu, Mathematics (yujt@hku.hk)				
Teachers Involved	Prof J T Yu, Mathematics				
Course Objectives	This course is an extension of Algebra I and goes deeper into the various topics treated in that course Together, the two courses are complete in themselves, and may be followed by Topics in Algebra and Topics in Applied Discrete Mathematics.				
Course Contents & Topics	- Presentation of groups: generators and relations, free groups - Polynomial rings in several variables - Fundamental theorem on symmetric polynomials - Fields extensions, elements of Galois theory (characteristic zero)				
Course Learning Outcomes	On successful completion of the course, students should be able to:				

	<ol> <li>Understand and compute splitting fields of irreducible polynomials.</li> <li>Understand and compute typical extensions of fields.</li> <li>Compute the automorphisms and Galois groups of field extensions.</li> </ol>					
Pre-requisites and Co-requisites and mpermissible combination)	Pass in Ma	Pass in MATH3301 Algebra I				
Offer in 2014 - 2015	Y 2nd	Y 2nd sem Examination May				
Offer in 2015 - 2016	Υ					
Course Grade	A+ to F					
Grade Descriptors	A Demonstrate an excellent understanding of key concepts and ideas by being able to identify the approx theorems and their applications through correctly analysing problems, clearly and elegantly presenting correct reasoning and argumentation and being able to carry out computations carefully and correctly, and with innovative approaches to solving problems.				resenting correct logical	
	В	Demonstrate a good understanding of ke and their applications through correctly identifying the appropriate theorems or th	analysing problems, but w	rith some minor inaded	quacies in arguments,	
	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  Demonstrate poor and inadequate understanding by not being able to identify appropriate theorems or applications, or not being able to complete the solution.				ate theorems or their	
Course Type	Lecture-ba	ased course				
Course Teaching	Activities	<b>3</b>	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 (%)	
	Examinat	ion			50	
	Test				50	
Required/recommended reading and online materials	J.B. Fraleigh: A First Course in Abstract Algebra (Addison-Wesley, 1989, 4th ed.) I.N. Herstein: Topics in Algebra (Wiley, 1975) N. Jacobson: Basic Algebra (Freeman, 1974) S. Lang: Undergraduate Algebra (Springer, 1996) T.W. Hungerford: Abstract Algebra: An Introduction (Saunders College Publishing, 1990, 2nd ed.)					
Course Website	http://hkun	nath.hku.hk/course/MATH4302/				

MATH4402 Analysis II (6 c	redits)	Academic Year	2014		
Offering Department	Mathematics	Quota			
Course Co-ordinator	Dr F Ye, Mathematics (fye@maths.hku.hk)				
Teachers Involved	Dr F Ye, Mathematics				
Course Objectives	This course gives a comprehensive and rigorous treatment of treatment of integration theory in the language of differential studies in analysis and geometry.				
Course Contents & Topics	Differentiation of functions of several variables: partial derivatives, differential, differentiability, inversifunction theorem, implicit function theorem, free extremum problems, constrained extremum problem method of Lagrange multipliers Integration in R^n: Basic definitions, measure zero and content zero sets, integrability, Fubini's Theorem partition of unity, change of variables Integration on chains: tensors, alternating tensors, vector fields, differential forms, Poincare Lemma Stokes' Theorem				
Course Learning Outcomes	On successful completion of the course, students should be able to:  1. Demonstrate knowledge and understanding of the modern language of mathematical analysis and geometry (e.g., able to manipulate differential forms).  2. Apply knowledge and skills acquired in mathematical analysis to analyze and handle novel situations i a critical way (e.g., able to determine the differentiability and integrability of specific functions).  3. Think creatively and laterally to generate innovative solutions to novel problems (e.g., able to do integration of specific functions on chains).				
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in MATH3401 Analysis I				
Offer in 2014 - 2015	Y 2nd sem	Examination	May		
Offer in 2015 - 2016	Y				

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 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-l	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	Method	ls	Details	Weighting in final course grade (%)		
	Examination			50		
	Test			50		
Required/recommended reading and online materials	Apostol: Mathematical Analysis Munkres: Analysis on Manifolds Rudin: Principles of Mathematical Analysis Spivak: Calculus on Manifolds					
and online materials						

	alysis (6 cre	dits)	Academic Yea	ar 2014		
Offering Department	Mathemati	cs	Quota			
Course Co-ordinator	Dr C W Wo	ong, Mathematics (cwwongab@hku.hk)				
Teachers Involved	Dr C W Wo	Dr C W Wong, Mathematics				
Course Objectives	This cours of modern	e introduces students to the basic knowledge analysis.	of linear functional analysis	, an important brand		
Course Contents & Topics	- Normed sequences Special pooperators - Fundame Category ti	aces: Open and closed sets. Convergent seques spaces, Banach spaces: Finite dimensional numbers of the spaces, Banach spaces: Finite dimensional numbers. Bounded linear operators. Normed spaced out spaces, Hilbert spaces: Orthogonal cost, series related to orthonormal sets and set olynomials. Riesz's representation theorem. Lental theorems for normed and Banach space heorem, uniform boundedness principle. Operatheory of linear operators	cormed spaces and subspace ces of operators, dual space omplements, direct sums. C quences. Total orthonormal Adjoint operator, self-adjoint aces: Hahn-Banach theorer	orthonormal sets and sets and sequences , normal and unitar n. Reflexive spaces		
Course Learning Outcomes	1. Compar	sful completion of the course, students should re and contrast (i) finite and infinite dimensi	onal linear spaces, (ii) com	plete and incomplete		
	completende 2. Understa these space 3. Discuss 4. Discuss	ce, and (iii) normed and inner product spaces and discuss how vectors are represented and the notions of Banach spaces and Hilbert ces. the dual spaces of some standard Banach spathe boundedness of linear operators and the inctional analysis in the study of differential equal to the study of dif	in these spaces. Spaces. State and apply fun aces. spectra of special linear oper	damental theorems		
(and Co-requisites and	completender 2. Understathese space 3. Discuss 4. Discuss 5. Apply fu	ess and discuss how vectors are represented and the notions of Banach spaces and Hilbert ces. the dual spaces of some standard Banach sp the boundedness of linear operators and the	in these spaces. Spaces. State and apply fun aces. spectra of special linear oper uations and optimization prol r algebra II, MATH2211 Mult	damental theorems i ators. olems.		
(and Co-requisites and Impermissible combination)	completenders: Understathese space 3. Discuss 4. Discuss 5. Apply fur Pass in MATH224	ess and discuss how vectors are represented and the notions of Banach spaces and Hilbert ses. the dual spaces of some standard Banach space the boundedness of linear operators and the inctional analysis in the study of differential eq ATH2101 Linear algebra I, MATH2102 Linear	in these spaces. Spaces. State and apply fun aces. spectra of special linear oper uations and optimization prol r algebra II, MATH2211 Mult	damental theorems ators.		
(and Co-requisites and Impermissible combination) Offer in 2014 - 2015	completenders: Understathese space 3. Discuss 4. Discuss 5. Apply fur Pass in MATH224	ess and discuss how vectors are represented and the notions of Banach spaces and Hilbert ies.  the dual spaces of some standard Banach space the boundedness of linear operators and the inctional analysis in the study of differential eq ATH2101 Linear algebra I, MATH2102 Linear 1 Introduction to mathematical analysis and M	in these spaces. Spaces. State and apply fundaces. spectra of special linear oper uations and optimization prolonal ralgebra II, MATH2211 Multath3401 Analysis I	damental theorems ators. olems. variable calculus an		
(and Co-requisites and	completender 2. Understathese space 3. Discuss 4. Discuss 5. Apply fur Pass in MATH224*	ess and discuss how vectors are represented and the notions of Banach spaces and Hilbert ies.  the dual spaces of some standard Banach space the boundedness of linear operators and the inctional analysis in the study of differential eq ATH2101 Linear algebra I, MATH2102 Linear 1 Introduction to mathematical analysis and M	in these spaces. Spaces. State and apply fundaces. spectra of special linear oper uations and optimization prolonal ralgebra II, MATH2211 Multath3401 Analysis I	damental theorems ators. olems. variable calculus an		
Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016	completend 2. Underst these space 3. Discuss 4. Discuss 5. Apply fu Pass in MATH224 Y 2nd Y	ess and discuss how vectors are represented and the notions of Banach spaces and Hilbert ies.  the dual spaces of some standard Banach space the boundedness of linear operators and the inctional analysis in the study of differential eq ATH2101 Linear algebra I, MATH2102 Linear 1 Introduction to mathematical analysis and M	in these spaces. Spaces. State and apply funces. spectra of special linear oper uations and optimization prolor algebra II, MATH2211 Mult ATH3401 Analysis I  Examination  Incepts and ideas by being able to sing problems, clearly and elegantly	ators. plems.  variable calculus an May		

	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 argument and presentation or a number of minor computational errors.				
	D		g able to correctly identify appropriate ough incorrectly analysing problems with		
	Fail	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 course			
Course Teaching & Learning Activities	Activities		Details	No. of Hours	
& Learning Activities	Lectures			36	
	Tutorials			12	
	Reading / Self study			100	
Assessment Methods and Weighting	Method	ls	Details	Weighting in final course grade (%)	
	Examination			50	
	Test			50	
Required/recommended reading and online materials	Erwin Kreyszig: Introductory Functional Analysis with Applications (John-Wiley and Sons, 1978)			Wiley and Sons, 1978)	
Course Website	http://hku	umath.hku.hk/course/MATH4404/			

MATH4406 Introduction t	o partial dif	fferential equations (6 credits)		Academic Year	2014	
Offering Department	Mathema	tics		Quota		
Course Co-ordinator	Dr S Wu,	Mathematics (swu@maths.hku.hk)				
Teachers Involved	Dr S Wu,	Mathematics				
Course Objectives		se introduces students to the basic tec lying theories.	hniques for solving	partial differential eq	uations as well a	
Course Contents & Topics	value and Duhamel' solutions.	Laplace, heat and wave equations. Classification of partial differential equations. Boundary-value, initial value and eigenvalue problems. Separation of variables, Fourier series, linearity and superposition, Duhamel's principle, characteristic method. Green's function, generalized functions and fundamental solutions. Maximum principle, existence, uniqueness and continuous dependence on data. If time permits Cauchy-Kowalevski theorem, variational method, nonlinear partial differential equations.				
Course Learning Outcomes	1. Apply t 2. Unders	On successful completion of the course, students should be able to:  1. Apply the tools of calculus, linear algebra, mathematical analysis in a coherent way to PDE problems.  2. Understand the basic theory of partial differential equations and the methods to solve them.  3. Apply the knowledge of partial differential equations to physical sciences and engineering.				
Pre-requisites (and Co-requisites and Impermissible combination)	mathema	MATH2101 Linear algebra I, MAT tical analysis; and IATH3405 Differential equations, or alr	· ·	,	Introduction to	
Offer in 2014 - 2015	Y 1st	sem		Examination	Dec	
Offer in 2015 - 2016	Y					
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>B</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	Demonstrate poor and inadequate unders applications, or not being able to complete the		able to identify appropriat	e theorems or their	
Course Type	Lecture-b	ased course				
Course Teaching	Activitie	es .	Details		No. of Hours	
Learning Activities	Lectures	;			36	
	Tutorials				1:	
	Reading	/ Self study			100	
Assessment Methods and Weighting	Methods	S	Details	V	Veighting in fina	

		course grade (%)
	Examination	50
	Test	50
Required/recommended reading and online materials	W.A. Strauss: Partial Differential Equations: An Introduction, 2i D. Bleecker & G. Scordas: Basic Partial Differential Equations L.C. Evans: Partial Differential Equations (American Mathemat	(International Press)
Course Website	http://hkumath.hku.hk/course/MATH4406/	

MATH4501 Geometry (6 o	redits)			Academic Year	2014	
Offering Department	Mathemat	ics		Quota		
Course Co-ordinator		ood, Mathematics (fullwood@maths.hku.	.hk)	12222		
Teachers Involved		Dr J Fullwood, Mathematics				
Course Objectives	universe i training in space. In	As geometric forms often appear in nature, the study of geometry helps us to understand better the universe in which we live. Moreover, geometry has much intrinsic beauty and the study of it is an exceller training in intuitive thinking. In this course we study the differential geometry of curves and surfaces in space. In the study of regular surfaces in 3-space we exhibit geometric notions that are definable in term of metrical properties of these surfaces alone, leading to the intrinsic geometry of surfaces.				
Course Contents & Topics		d space curves, regular surfaces in t and mean curvatures, Gauss's Theorem			he Gauss map,	
Course Learning Outcomes	1. Unders 2. Be able	On successful completion of the course, students should be able to:  1. Understand the fundamental theorems on curves.  2. Be able to compute the Gaussian and mean curvatures.  3. Understand the basics of intrinsic geometry of surfaces.				
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in M	ATH2101 Linear algebra I and MATH340	01 Analysis I			
Offer in 2014 - 2015	Y 1st	sem		Examination	Dec	
Offer in 2015 - 2016	Υ	Y				
Course Grade	A+ to F					
Grade Descriptors	A Demonstrate an excellent understanding of key concepts and ideas by being able to identify the a theorems and their applications through correctly analysing problems, clearly and elegantly presenting correasoning and argumentation and being able to carry out computations carefully and correctly, and innovative approaches to solving problems.  B Demonstrate a good understanding of key concepts and ideas by being able to identify the appropriate the their applications through correctly analysing problems, but with some minor inadequacies in arguments, 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 a theorems, but with some inadequacies in applying the theorems through incorrectly analysing problems 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 a theorems, but with substantial inadequacies in applying the theorems through incorrectly analysing propor argument or presentation or with substantial computational errors.  Fail Demonstrate poor and inadequate understanding by not being able to identify appropriate theorem applications, or not being able to complete the solution.				senting correct logical ctly, and with some opriate theorems and rguments, identifying al errors.  y identify appropriate problems with poor identify appropriate lysing problems with	
Course Type	Lecture-ba	ased course				
Course Teaching & Learning Activities	Activities Lectures Tutorials Reading	S / Self study	Details		No. of Hours 36 12 100	
Assessment Methods and Weighting	Methods		Details		leighting in final course grade (%)	
	Examina	tion			50	
	Test				50	
Required/recommended reading and online materials	M P Do C	armo: Differential Geometry of Curves an	nd Surfaces (Prention	ce-Hall, 1976)		
Course Website	http://hkur	math.hku.hk/course/MATH4501/				

MATH4511 Introduction to differentiable manifolds (6 credits)			Academic Year	2014		
Offering Department Mathematics			Quota			
Course Co-ordinator	Prof W K Ching, Mathematics (wching@hku.hk)	Prof W K Ching, Mathematics (wching@hku.hk)				
Teachers Involved	Prof W K Ching, Mathematics					

Course Objectives	tools for distributio	The course aims at introducing students to the notion of differentiable manifolds and basic concepts and tools for their study, such as differential forms, exterior differentiation and integration; vector fields, distributions, and integrability; and covariant differentiation through affine connections. The course also aims at presenting concrete examples that are relevant to further fields of study.				
Course Contents & Topics	Differential forms an	Review on functions of several variables, inverse mapping theorem, implicit function theorem. Differentiable manifolds: definitions and examples. Maps between manifolds, submanifolds. Differential forms and exterior differentiation. Integration on manifolds. The tangent bundle, distributions and Frobenius Theorem. Further topics.				
Course Learning Outcomes	1. Unders	On successful completion of the course, students should be able to:  1. Understand the basic language and concepts of modern differential geometry with examples.				
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in M	<ol> <li>Apply the knowledge of algebra and analysis learned previously to solve geometric problems.</li> <li>Pass in MATH3401 Analysis I (having taken MATH4501 Geometry would be helpful; the course can also be taken concurrently with MATH4402 Analysis II)</li> </ol>				
Offer in 2014 - 2015	N		Exami	nation		
Offer in 2015 - 2016	Υ					
Course Grade	A+ to F					
Grade Descriptors	A	Demonstrate an excellent understanding or theorems and their applications through corre reasoning and argumentation and being at innovative approaches to solving problems.	ectly analysing problems, clearly and e	legantly preser	nting correct logical	
	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	Demonstrate poor and inadequate underst applications, or not being able to complete th		/ appropriate	theorems or their	
Course Type	Lecture-b	ased course				
Course Teaching	Activitie	s	Details		No. of Hours	
& Learning Activities	Lectures				36	
	Tutorials				12	
	Reading	/ Self study			100	
Assessment Methods and Weighting	Methods	3	Details		ighting in final urse grade (%)	
	Examina	tion			50	
	Test				50	
Required/recommended reading and online materials	2003) W. Booth Press, 20	Dennis Barden and Charles B. Thomas: An Introduction to Differential Manifolds, (Imperial College Press,				
Course Website		math.hku.hk/course/MATH4511/	,			

MATH4602 Scientific comp	outing (6 credits)	Academic Year	2014			
Offering Department	Mathematics	Quota				
Course Co-ordinator	Prof W K Ching, Mathematics (wching@hku.hk)					
Teachers Involved	Prof W K Ching, Mathematics					
Course Objectives		This course introduces mathematical theories and computational techniques for solving various kinds of matrix computation problems that are often encountered in scientific or industrial applications.				
Course Contents & Topics	Introduction to scientific computing, systems of linear equations, direct methods, matrix norms, von Neumann series, iterative methods, eigenvalues, power method, spectral radius, Schur's Theorem, Gershgorin's Theorem, and some selected topics: multigrid methods, projection methods, recursion methods, fast Fourier transform, linear least squares, singular values, boundary value problems, partial differential equations, parallel computing, etc.					
Course Learning Outcomes	On successful completion of the course, students should be able to:  1. Apply direct method in solving a linear system. 2. Analyze the complexity of a numerical algorithm. 3. Give a proof for Schur's Theorem and Gershgorin's Theorem. 4. Apply iterative methods in solving a linear system. 5. Compute the singular values of a matrix.					
Pre-requisites (and Co-requisites and	Pass in MATH3601 Numerical analysis					

Impermissible combination)						
Offer in 2014 - 2015	N			Examination		
Offer in 2015 - 2016	Y					
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 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 or with some minor computational errors.				
	С					
	D	Demonstrate some understanding of key concepts and ideas by being able to correctly identify appropriate theorems and numerical algorithms, but with substantial inadequacies in applying them through incorrectly analysing problems with poor argument or presentation or with substantial computational errors.				
	Fail	Demonstrate poor and inadequate understanding by not being able to identify appropriate theorems and numerical algorithms or their applications, or not being able to complete the solution.				
Course Type	Lecture-	based course				
Course Teaching	Activities		Details		No. of Hours	
& Learning Activities	Lecture	S			36	
	Tutorials				12	
	Reading / Self study				100	
Assessment Methods and Weighting	Method	Is	Details		eighting in final ourse grade (%)	
	Examin	ation			50	
	Test				50	
Required/recommended reading and online materials		Michael T. Heath: Scientific Computing (McGraw Hill, 1997) Charles F. Van Loan: Introduction to Scientific Computing, Matlab Curriculum Series (Prentice Hall, 1997)				
Course Website	http://hki	umath.hku.hk/course/MATH4602	1			

MATH4902 Operations res	search II (6	redits)			1	Academic Year	2014
Offering Department	Mathemat	S			C	Quota	
Course Co-ordinator	Dr G Han,	Mathematics (ghan	@maths.hku.hk)				
Teachers Involved	Dr G Han,	Mathematics					
Course Objectives	programm research. with cours	objective is to provide a fundamental account of the basic results and techniques of integeramming (IP), dynamic programming (DP) and Markov decision processes (MDP) in operation earch. There is emphasis on aspects of algorithms as well as applications. The course serves, together courses on linear programming and network models, to provide essential optimization concept anorithms for more advanced studies in operations research.					
Course Contents & Topics		gramming and heur scounted/average o		orogramming (	deterministic	c/stochastic) and	Markov decisi
Course Learning Outcomes	1. Under	ful completion of the and the terminolog and Markov deci- the typical technique	ogy and nomer sion process.	nclature appro	opriate to		
	3. Demon	rate the knowledge	on algorithms fo	or a variety of p	roblems in	operations resear	ch.
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in M		ebra I and MATH	l2211 Multivari	able calculu	s; and	rch.
(and Co-requisites and Impermissible combination)	Pass in M	rate the knowledge TH2101 Linear alge	ebra I and MATH	l2211 Multivari	able calculu I in this cour	s; and	
(and Co-requisites and Impermissible combination) Offer in 2014 - 2015	Pass in M Pass in M	rate the knowledge TH2101 Linear alge	ebra I and MATH	l2211 Multivari	able calculu I in this cour	s; and se	
(and Co-requisites and Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016	Pass in M Pass in M	rate the knowledge TH2101 Linear alge	ebra I and MATH	l2211 Multivari	able calculu I in this cour	s; and se	
(and Co-requisites and Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade	Pass in M Pass in M N	rate the knowledge TH2101 Linear alge	ebra I and MATH s research I, or a llent understanding algorithms and thei ical reasoning and	of key concepts applications throa	able calculu I in this cour  E  and ideas by ugh correctly a d being able to	se examination  being able to identinalysing problems, c	fy basic principle learly and elegan
(and Co-requisites and	Pass in M Pass in M N N A+ to F	rate the knowledge TH2101 Linear algorations TH3901 Operations  Demonstrate an exce appropriate theorems, presenting correct log	ebra I and MATH s research I, or a lent understanding algorithms and their ical reasoning and problems with some inderstanding of key and their applications	of key concepts applications through airnovative approacconcepts and idea through correctly	able calculu I in this cour  and ideas by ugh correctly a d being able to ches.  as by being able analysing protein	s; and se  Examination  being able to identinalysing problems, co carry out computate to identify basic prilems, but with some	fy basic principle learly and elegan titions carefully ar nciples, appropria minor inadequaci

		errors.					
	D	Demonstrate some understanding of key theorems, algorithms and their applicatio incorrectly analysing problems with poor a	uacies in applying the theorems through				
	Fail		Demonstrate poor and inadequate understanding by not being able to identify basic principles, appropriate the algorithms or their applications, or not being able to complete or compute the solution.				
Course Type	Lecture-l	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	Method	ls	Details	Weighting in final course grade (%)			
	Examination			50			
	Test			50			
Required/recommended reading and online materials	S. Dreyfus and A. Law: The Art and Theory of Dynamic Programming (Academic Press, 1977) P. Thie: Markov Decision Processes (COMAP, Inc. 1983) G.L. Nemhauser and L.A. Wolsey: Integer and Combinatorial Optimization (Wiley, 1988)			,			
Course Website	http://hku	umath.hku.hk/course/MATH4902/					

MATH4907 Numerical me	thods for fil	nancial calculus (6 credits)		Academic Year	2014	
Offering Department	Mathemat	ics		Quota		
Course Co-ordinator	Dr S P Yu	ng, Mathematics (spyung@hku.hk)				
Teachers Involved	Dr S P Yu	ng, Mathematics				
Course Objectives		se aims at providing effective numerica arisen from financial derivatives and as		as their theoretical a	aspects for solving	
Course Contents & Topics	pricing dif	Introduction to the mathematical theory of vanilla and exotic options. Numerical methods for Black-Scholes pricing differential equations together with their performance analyses. Binomial tree methods, Monte Carlo simulations and their performance analyses.				
Course Learning Outcomes	On succes	ssful completion of the course, students	s should be able to:			
	financial d 2. Implem 3. Explain Scholes p	strate knowledge and understanding of lerivatives.  ent and analyse various numerical met the connection between the binomial ricing differential equation. ent and analyse Monte Carlo simulatio	thods on the Black-S tree method and the	Scholes pricing differ e finite difference m	rential equation. ethod of the Blac	
Pre-requisites (and Co-requisites and mpermissible combination)	Pass in M	ATH3906 Financial calculus or equival	ent			
Offer in 2014 - 2015	Y 2nd	Isem		Examination	May	
Offer in 2015 - 2016	N	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.					
	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 underst applications, or not being able to complete the		ole to identify appropria	ite theorems or their	
Course Type	Lecture-ba	ased course				
Course Teaching	Activities	S	Details		No. of Hour	
Learning Activities	Lectures				3	
	Tutorials				1	
	Reading	/ Self study			10	
Assessment Methods	Methods		Details		Weighting in fina course grade (%	

	Examination Test	50 50
Required/recommended reading and online materials	J. Strikwerda: Finite Difference Schemes and PDEs (\ Baxter and Rennie: Financial Calculus (Cambridge Ur Wilmott, Howison and Dewynne: The mathematics o 1995) Fleming and Rishel: Deterministic and Stochastic Opti	niversity Press, 1996) f Financial Derivatives (Cambridge University Press,
Course Website	http://hkumath.hku.hk/course/MATH4907/	

MATH4910 Senior Mathem	natics sem	ninar (6 credits)	Academic Y	ear 2014			
Offering Department	Mathema	atics	Quota	12			
Course Co-ordinator	TBC, Ma	thematics ()					
Teachers Involved	TBC, Ma	thematics					
Course Objectives	articles a	This seminar style capstone course aims to provide students the experience of intense reading of journal articles and book chapters, followed by group discussions through which knowledge acquisition and synthesis will be attained. Students will look at particular mathematical topics in depth, and will master the topics through reading, listening, discussing and writing.					
Course Contents & Topics	Research of knowle Reading convincir construct prepared The end	This seminar course may be in the form of research seminar, reading seminar, or a combination of both. Research seminar provides first-hand research experience to students, who will discuss the advancement of knowledge brought about by the readings, and the difficulties they encounter in the research process. Reading seminar involves discussions on arguments delivered by the authors of books or articles, and how convincing the arguments are. Participants will experience the process of argumentation in the construction of knowledge and development of research idea. Student performance is manifested in their preparedness, quality of comments, responsiveness to comments and overall engagement in the seminar. The end product is a research paper or written report and oral presentations. Topics chosen by the instructors, including journal articles and book chapters.					
Course Learning Outcomes	On succe	essful completion of the course, students	should be able to				
	Critiqu     Organ	n and discuss the contents of the topics are and argue about the ideas and theorie nize and synthesize the material they atical language.	s of the work they studied.	and in writing using			
Pre-requisites (and Co-requisites and Impermissible combination)	MATH4X Algebra I Subject t (This cou	at least 24 credits of advanced leve (XX, or MATH6XXX) in the Mathematics I, MATH3401 Analysis I, MATH3403 Fun to approval by the Department. Urse is for third and fourth year students of stone course is for Mathematics, and Mathematics, and Mathematics.	s, and Mathematics/Physics Majors ctions of a complex variable.	including MATH330			
Offer in 2014 - 2015	N		Examination	ı			
Offer in 2015 - 2016	Υ		'	'			
Course Grade	A+ to F						
Grade Descriptors	A Demonstrate an excellent understanding of the material by lucid exposition. Engage constructively by providing insightful analyses and raising critical points in group discussion. Demonstrate clear and critical analysis, coherent synthesis, and effective application of the knowledge through writing and oral presentation using mathematical language.						
	B Demonstrate a good understanding of the material by mostly clear and effective presentation. Engage actively in group discussion most of the time by providing helpful points and asking questions that advance the discussion. Demonstrate mostly clear and effective analysis, synthesis, and application of the knowledge through writing and oral presentation using mathematical language.						
	C Demonstrate a general understanding of the material by moderately effective presentation. Engage in group discussion most of the time with some useful input. Demonstrate moderately clear and effective analysis, synthesis, and application of the knowledge through writing and oral presentation using mathematical language.						
	Demonstrate a basic but limited understanding of the material by partially effective presentation. Plays a passive role, or gives limited useful contribution to group discussion. Demonstrate limited or barely effective analysis, synthesis, and application of the knowledge through writing and oral presentation using mathematical language.						
	Fail	Demonstrate inadequate understanding of the participation in and contribution to group disc application of the knowledge through writing a	ussion. Demonstrate inadequate or ineffective	analysis, synthesis, and			
Course Type	Project-b	pased course					
Course Teaching	Activitie	es	Details	No. of Hour			
& Learning Activities	Meeting	with supervisor	Seminars: Students take turns to give presentations to the whole class; group discussions.	3			
	Reading / Self study  Reading / Self study  Reading / Self study  Reading / Self study  Reading / Self study  Reading / Self study  Reading / Self study  Reading / Self study  Reading / Self study  Reading / Self study  Reading / Self study		10				
Assessment Methods and Weighting	Method	s	Details	Weighting in fina			
	Disserta	ation	Coursework assessment: Based on class participation and group	2			

		discussions.	
	Oral presentation	Seminar presentations by students	30
	Research report	Written report / research paper: Individual and/or group reports/research papers totally no more than 10,000 words.	50
Required/recommended reading and online materials	TBC		
Course Website	http://hkumath.hku.hk/course/MATH4910/		
Additional Course Information	Nil		

MATH4911 Mathematics	capstone p	roject (6 credits)	Academic Y	'ear 2014		
Offering Department	Mathema	atics	Quota			
Course Co-ordinator	TBC, Mat	thematics ()				
Teachers Involved	TBC, Mat	thematics				
Course Objectives		rse aims to provide students an expensional structure of the mathematical knowledge.		h requires integration		
Course Contents & Topics	Emphasis acquired a commu research, developm report, or	Students will work collaboratively in small groups on a project under the guidance of their supervisor(s Emphasis of this capstone project is on the integration and/or application of mathematical knowledg acquired by the students. The project topic is not limited to academic context, but can also be extended to a community or corporate outreach project. Projects may take the form of a combination of literature research, survey, data analysis, creation of artifacts or media contents, exhibition, public lectures development of solution plan for the problem under study, etc. Assessment may take the form of writte report, oral presentation, media production, portfolio, and/or peer evaluation, etc. Topics are either chose by the supervisor(s), or proposed by the students and approved by their supervisor(s).				
Course Learning Outcomes	On succe	essful completion of the course, student	ts should be able to			
	2. Work o	ate and apply mathematical knowledge collaboratively with others. nunicate their project topic to exper ate mathematical terms and language.		uitable media using		
Pre-requisites (and Co-requisites and Impermissible combination)	MATH4X Subject to (This cou	Pass in at least 24 credits of advanced level compulsory/core mathematics courses (MATH3XX MATH4XXX, or MATH6XXX) in the Mathematics, and Mathematics/Physics Majors. Subject to approval by the Department. (This course is for third and fourth year students only.) This capstone course is for Mathematics, and Mathematics/Physics Majors students only.				
Offer in 2014 - 2015	N		Examinatio	n		
Offer in 2015 - 2016	Υ		'	'		
Course Grade	A+ to F					
Grade Descriptors	A	A Demonstrate excellent and creative integration and/or application of the mathematical knowledge previously acquired. Take initiative in, and collaborate highly effectively on, the project. Communicate effectively through suitable media using appropriate mathematical terms and language.				
	В	B Demonstrate good integration and/or application of the mathematical knowledge previously acquired. Participate actively in, and collaborate mostly effectively on, the project. Communicate mostly effectively through suitable media using appropriate mathematical terms and language.				
	С	C Demonstrate a general level of integration and/or application of the mathematical knowledge previously acquired. Demonstrate moderately effective collaboration on the project. Moderately effective communication using mathematical terms and language.				
	D	Demonstrate some partial integration and/or application of the mathematical knowledge previously acquired. Demonstrate barely effective collaboration on the project. Show limited ability to effectively communicate using mathematical terms and language.				
	Fail		or application of the mathematical knowledge paboration on, the project. Communicate ineffect			
Course Type	Project-b	ased course				
Course Teaching	Activitie	9S	Details	No. of Hours		
& Learning Activities	Meeting	with supervisor	Students meet with their supervisor(s) to present results or to discuss their progress.	20		
	Assessn	nent	Project work: Students work on their project	130		
Assessment Methods and Weighting	Method	s	Details	Weighting in fina course grade (%		
	Disserta	tion	Coursework assessment: Based on participation and collaboration throughout the whole project.	20		

	Oral presentation	the project may include seminars, lectures, oral reports, audio recordings, etc.	30
	Research report	Written report / media production: This part may include written reports, booklets, exhibition materials, video productions, computer software, etc.	50
Required/recommended reading and online materials	TBC		
Course Website	http://hkumath.hku.hk/course/MATH4911/		
Additional Course Information	Nil		

MATH4966 Mathematics in	nternship (	6 credits)		Academic Year	2014
Offering Department	Mathematic	es		Quota	
Course Co-ordinator	Dr T W Ng,	Mathematics (ntw@maths.hku.hk)			
Teachers Involved	All teaching	staff, Mathematics			
Course Objectives	major of st	This course aims to offer students the opportunities to gain work experience in the industry related to thei major of study. The workplace learning experience would be of great benefits to the students to apply thei knowledge gained in the study to the real work environments. Students have to take on at least 160 hours of internship work either within the University or outside the University arranged by the department.			
Course Contents & Topics	various tas	Within the university: each student will be supervised by a staff member (supervisor), working on a project o various tasks as instructed by the supervisor.  Outside the university: each student will carry out approved work under the guidance and supervision of an external supervisor.			
Course Learning Outcomes	On success	sful completion of the course, students s	hould be able to:		
		rk experience in an industry related to maunderstanding of how mathematics is us			
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in at least 24 credits of advanced level compulsory/core mathematics courses (MATH3XX MATH4XXX, or MATH6XXX) in the Mathematics, and Mathematics/Physics Majors. Students are expected to have satisfactorily completed their Year 3 study. This capstone course is for Mathematics, and Mathematics/Physics Majors students only.				ses (MATH3XXX,
Offer in 2014 - 2015	Y 2nd	sem Summer		Examination	No Exam
Offer in 2015 - 2016	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  Very limited or no ability to solve problems in the workplace. Fails to handle or carry out the work required in the job or assigned by supervisor(s). Fails to establish effective collaboration or communication with supervisor(s), other colleagues, or clients in the job. Fails to satisfy the requirements set out in the Course Description regarding working hours, written and oral report, or evaluation by supervisor(s), etc.				
Course Type	Internship				
Course Teaching	Activities		Details		No. of Hours
& Learning Activities	Internship	work	it is expected that s work at least 160 equivalent of 4 wee	hours (or the	160
Assessment Methods and Weighting	Methods		Details		Weighting in final course grade (%)
	Written report written report, employer's feedback and oral presentation			100	
Additional Course Information	those who Satisfactory internship Distinction" obtain the a Enrolment	Students are expected to have satisfactorily completed their Year 3 study. Special consideration be given those who have completed Year 2.  Satisfactory completion of this course can be counted towards the Capstone requirement. Details of internship will be recorded on the student's transcript. This course will be assessed on "Pass, Fail an Distinction" basis. Students who are interested to enrol in this course should contact the Department to obtain the approval.  Enrolment of this course is not conducted via the online course selection system and should be mad through the relevant Department/School office after approval has been obtained from the course coordinate.			

MATH4999 Mathematics	project (12 credits)	Academic Year	2014
Offering Department	Mathematics	Quota	

Course Co-ordinator	Prof W K	Ching, Mathematics (wching@hku.hk)			
Teachers Involved	All teachir	ng staff, Mathematics			
Course Objectives	problems	The aim of the course is to provide students with the opportunity to formulate and to investigate, in depth, problems of practical interest and/or to have a foretaste of mathematical research. The work, to be done on an individual basis, is considered a highly desirable part of the training of a mathematician.			
Course Contents & Topics	superviso good star	The subject matter of the project will be determined by consultation between the student and his/he supervisor. The projects will be selected from areas of pure and applied mathematics. Students must achiev good standing and get the approval from both the prospective supervisor and the course co-ordinator to tak this course.			
Course Learning Outcomes	1. Study i 2. Analyzo 3. Articula	On successful completion of the course, students should be able to:  1. Study independently and in depth an advanced topic that is not available in the regular curriculum.  2. Analyze and synthesize information gathered from different sources.  3. Articulate their findings and conclusions.  4. Give an exposition of their work in a written report.			
Pre-requisites (and Co-requisites and Impermissible combination)	MATH4XX Algebra I	at least 24 credits of advanced level compulsory/cor (XX, or MATH6XXX) in the Mathematics, and Mathematic and MATH3401 Analysis I. tone course is for Mathematics, and Mathematics/Physics N	cs/Physics Majors inc		
Offer in 2014 - 2015	N		Examination		
Offer in 2015 - 2016	Υ	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 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.			
	Demonstrate general but incomplete grasp of the subject. Evidence of some analytical and critical abilities and logical thinking. Use of relevant information from sources, showing ability to make comparisons between different interpretations and to reference aptly. Mostly correct but some erroneous use of data and results to draw appropriate conclusions. Apply moderately effective organizational and presentational skills.				
	D	Demonstrate partial but limited grasp, with retention of some relevant information, of the subject. Evidence of som coherent and logical thinking, but with limited analytical and critical abilities. Demonstrate use and reference of sever sources, but mainly through summary rather than analysis and comparison. Limited ability to use data and results to dra appropriate conclusions. Apply limited or barely effective organizational and presentational skills.			
	Fail				
Course Type	Project-ba	ased course			
Course Teaching	Activitie	s Details		No. of Hours	
& Learning Activities	Reading	Reading / Self study independent work & to attend meetings & seminars			
Assessment Methods and Weighting	Methods	Details		Weighting in final course grade (%)	
	Dissertat	ion Written repo presentation	ort plus oral	100	

MATH6101 Intermediate co	omplex analysis (6 credits)	Academic Year	2014			
Offering Department	Mathematics Quota					
Course Co-ordinator	Prof N Mok, Mathematics (nmok @hku.hk)					
Teachers Involved	Prof N Mok, Mathematics					
Course Objectives	The objective is to familiarize students with analytic, algebraic and guthe study of Complex Analysis in a single variable beyond an intromplex variable.					
Course Contents & Topics	In the course we study meromorphic functions on compact Riema surfaces using analytic and algebraic techniques. Topics on m constructions of meromorphic functions on compact Riemann surface the Mittag-Leffler Problem and the Weierstrass Problem on compact Riemann surfaces. In the course of study of meromorphic function cohomology theories in terms of differential forms will be introduced included. Examples of possible topics include normal families, the Riemann surfaces.	peromorphic function es, elliptic functions, l act Riemann surface ons, sheaf cohomolo ed. A choice of othe emann Mapping The	include the Poincare series, is and on open ogy theory and in topics will be borem, geometric			
Course Learning Outcomes	On successful completion of this course, students should be able to:  1. Deal with rational functions on the Riemann Sphere and deal with elliptic functions, equivalently meromorphic functions on elliptic curves.  2. Formulate various classical existence problems on meromorphic functions and reduce them to analytic					
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	<ol> <li>Identifunctions</li> <li>Identifunctions</li> </ol>	or cohomological problems, being able to solve them in certain typical cases.  3. Identify the key arguments in the proofs of various mathematical results concerning meromorp functions on compact Riemann surfaces or on plain domains.  4. Identify the key elements in the theoretic foundation of various additional topics covered in the couland to make use of them in solving problems.				
Pre-requisites (and Co-requisites and Impermissible combination)		A first course in Complex Analysis such as MATH3403 Functions of a Complex Variable, and approval by the instructor.				
Offer in 2014 - 2015	Y 1s	t sem		Examination	Dec	
Offer in 2015 - 2016	Υ			'	'	
Course Grade	A+ to F					
Grade Descriptors	A Demonstrate an excellent understanding of key concepts and ideas by being able to identify theorems and their applications through correctly analysing problems, clearly and elegantly presentin reasoning and argumentation and being able to carry out computations carefully and correctly, innovative approaches to solving problems.				senting 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.					
	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 problem poor argument or presentation or with substantial computational errors.				
	Fail					
Course Type	Lecture-k	pased course				
Course Teaching	Activitie	98	Details		No. of Hours	
& Learning Activities	Lectures	8			36	
	Reading	/ Self study			100	
Assessment Methods and Weighting	Method	s	Details		Weighting in final course grade (%)	
	Assignm	nents			50	
	Examina	Examination Final examination				
Required/recommended reading and online materials	O. Forste	imhan: Complex Analysis in One Varial er: Lectures on Riemann Surfaces, Spri way: Functions of One Complex Variab Irasekharan: Elliptic Functions, Springe	nger-Verlag 1981. le I, Springer-Verlag 1	,		

MATH6201 Topics in geon	netry (6 credits)	Academic Year	2014		
Offering Department	Mathematics	Quota			
Course Co-ordinator	Dr S Wu, Mathematics (swu@maths.hku.hk)				
Teachers Involved	Dr S Wu, Mathematics				
Course Objectives	This course introduces to students a main area of differential geometry beyond the notion of manifolds at the calculus of differential forms and prepares them to study further and to do research in geometry.				
Course Contents & Topics	The topic varies according to the year and the instructor. For example, it can be one of (but not restrict to) the following.  1. Riemannian geometry: affine and Levi-Civita connection, Riemann curvature tensor, spinor bundle Laplace and Dirac operators, harmonic forms and spinors, applications in relativity;  2. Symplectic geometry: symplectic vector spaces, symplectic manifolds, Lagrangian submanifold Hamiltonian group actions, moment maps, symplectic quotients, convexity theorems, localization;  3. Vector bundles: vector bundles; connection and curvature, characteristic forms and classes superconnections transgrassion, topological Kethogry, introduction to index theory.				
	<ol><li>Vector bundles: vector bundles, connection and cur superconnections, transgression, topological K-theory, introdu</li></ol>		is and classes		
Course Learning Outcomes		uction to index theory.  able to:  ms beyond the level of MAT	<sup>-</sup> H3511.		
Course Learning Outcomes  Pre-requisites (and Co-requisites and Impermissible combination)	superconnections, transgression, topological K-theory, introduced on successful completion of this course, students should be a 1. Have a working knowledge of the calculus of differential for 2. Understand the keys points of the particular subject chemical superconnections.	uction to index theory.  able to:  ms beyond the level of MAT osen and be ready to lear	TH3511. n other topics i		
Pre-requisites (and Co-requisites and Impermissible combination)	superconnections, transgression, topological K-theory, introduced on successful completion of this course, students should be a successful completion of the calculus of differential for 2. Understand the keys points of the particular subject characteristics of the particular subject characteristics.  (MATH4402 Analysis II or MATH4501 Geometry) and (MATH4501 Geometry)	uction to index theory.  able to:  ms beyond the level of MAT osen and be ready to lear	TH3511. n other topics i		
Pre-requisites (and Co-requisites and Impermissible combination) Offer in 2014 - 2015	superconnections, transgression, topological K-theory, introduced on successful completion of this course, students should be a successful completion of the calculus of differential for 2. Understand the keys points of the particular subject characteristics (MATH4402 Analysis II or MATH4501 Geometry) and (MATH or the approval of the instructor)	uction to index theory.  able to:  ms beyond the level of MAT osen and be ready to lear 14511 Introduction to Difference.	TH3511. n other topics i		
Pre-requisites (and Co-requisites and	superconnections, transgression, topological K-theory, introduced on successful completion of this course, students should be a second successful completion of the calculus of differential for 2. Understand the keys points of the particular subject characteristics (MATH4402 Analysis II or MATH4501 Geometry) and (MATH401 or the approval of the instructor)	uction to index theory.  able to:  ms beyond the level of MAT osen and be ready to lear 14511 Introduction to Difference.	TH3511. n other topics i		

	В	and their applications through correct	Demonstrate a good understanding of key concepts and ideas by being able to identify the appropriate they and their applications through correctly analysing problems, but with some minor inadequacies in argumidentifying the appropriate theorems or their applications and presentation or with some minor computational er		
	С	Demonstrate an acceptable understanding of key concepts and ideas by being able to theorems, but with some inadequacies in applying the theorems through incorrectly a argument and presentation or a number of minor computational errors.			
	D		g able to correctly identify appropriate ough incorrectly analysing problems with		
	Fail		Demonstrate poor and inadequate understanding by not being able to identify appropriate theorems or applications, or not being able to complete the solution.		
Course Type	Lecture-l	pased course			
Course Teaching	Activities		Details	No. of Hours	
& Learning Activities	Lectures			36	
	Reading / Self study			100	
Assessment Methods and Weighting	Methods Details			Weighting in final course grade (%)	
	Assignm	nents		50	
	Examination			50	
Required/recommended reading and online materials	TBC	TBC			

MATH6202 Complex manif	folds (6 cre	dits)	Academic Year	2014		
Offering Department	Mathematic	cs	Quota			
Course Co-ordinator	Prof N Mok	k, Mathematics (nmok@hku.hk)				
Teachers Involved	Prof N Mok Dr F Ye, M	x, Mathematics athematics				
Course Objectives		This course aims to present the foundation of the theory of complex manifolds and to introduce students a variety of research topics, focusing on compact complex manifolds.				
Course Contents & Topics	cohomolog Hermitian I fundament: Theorem, t course cor manifolds. (a) Siegel's (b) geomet (c) an intro	This course contains an introductory part on basic notions on complex manifolds including sheaf 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 complex manifolds. Examples of such topics include  (a) Siegel's Theorem on the field of meromorphic functions on a compact complex manifold;  (b) geometry of compact quotients of bounded symmetric domains and Hermitian symmetric manifolds;  (c) an introduction to the deformation theory of complex structures on a compact complex manifold.				
Course Learning Outcomes	1. Grasp th global holo manifolds. 2. Grasp th make use harmonic fo 3. Grasp th Kahler man positivity of 4. Identify	sful completion of this course, students should be a the notion of holomorphic line bundles, understand was propriate sections of line bundles, and to relate the the relationship between sheaf cohomology, de Rho of the relationship to solve various existence propriate. The basics of complex differential geometry such a shifolds and on Hermitian holomorphic vector bund of curvature and apply them to vanishing and embed the key elements in the theoretic foundation of value use of them in solving problems.	rarious ways for establishing nem to the embedding of common cohomology and d-bar oblems by means of vanishing as notions of connections ales, and be able to relate validing theorems.	compact completed complete complete compact co		
Pre-requisites (and Co-requisites and Impermissible combination)		se in Complex Analysis such as MATH3403 Funct Geometry such as MATH4501 Geometry, and app		a first course		
Offer in 2014 - 2015	N		Examination			
Offer in 2015 - 2016	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.					
	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.				
				problems with pot		

		theorems, but with substantial inadequacies in applying the theorems through incorrectly analysis poor argument or presentation or with substantial computational errors.				
	Fail		Demonstrate poor and inadequate understanding by not being able to identify appropriate theorems or pplications, or not being able to complete the solution.			
Course Type	Lecture-ba	ed course				
Course Teaching & Learning Activities	Activities	3	Details	No. of Hours		
& Learning Activities	Lectures			36		
	Reading /	Self study		100		
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)		
	Assignments			50		
	Examination		Final examination	50		
Required/recommended reading and online materials	P. Griffiths & J. Harris: Principles of Algebraic Geometry, Pure and Applied Mathematics, W Interscience Publishers, New York 1978. K. Kodaira: Complex Manifolds and Deformation of Complex Structures, Grundlehren der mathematisc Wissenschaften 283, Springer-Verlag, Berlin-Heidelberg 1986. N. Mok: Metric Rigidity Theorems on Hermitian Locally Symmetric Manifolds, World Scientific, Singap New Jersey 1989.			dlehren der mathematischen		

MATH6217 Topics in finan	cial mathematics (6 credits)			Academic Year	2014	
Offering Department	Mathematics			Quota		
Course Co-ordinator	Dr J Song	Dr J Song, Mathematics (txjsong@hku.hk)				
Teachers Involved	Dr J Song	Dr J Song, Mathematics				
Course Objectives	managem	This course aims at introducing students to fundamental knowledge in financial mathematics and risk management. It can help preparing students to research or take more advanced courses in those directions.				
Course Contents & Topics	Topics wil	I be chosen among the followings:				
	(ii) Mather	<ul><li>(i) Investment models and portfolio theory. Interest rate modeling.</li><li>(ii) Mathematics of financial derivatives, pricing and hedging. Estimation and modeling of volatilities.</li><li>(iii) Risk measures and risk management.</li></ul>				
Course Learning Outcomes	On succes	ssful completion of this course, stud	ents should be able to:			
	<ol> <li>Grasp t</li> <li>Underst</li> </ol>	Understand and be able to utilize various models and results in investment and interest rate.     Grasp the methodology in derivative pricings and the modeling of volatilities.     Understand and be able to utilize the concept of risk measures and risk management; subject to the topics chosen that year.				
Pre-requisites (and Co-requisites and Impermissible combination)		Pass in an advanced level mathematics courses (MATH3XXX, MATH4XXX, or MATH6XXX) and subject to the approval of the course coordinator.				
Offer in 2014 - 2015	Y 1st	sem		Examination	Dec	
Offer in 2015 - 2016	Υ	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.					
	С	Demonstrate an acceptable understanding of key concepts and ideas by being able to correctly identify appropriate theorems, but with some inadequacies in applying the theorems through incorrectly analysing problems with poor argument and presentation or a number of minor computational errors.				
	Demonstrate some understanding of key concepts and ideas by being able to correctly identify appropriate theorems, but with substantial inadequacies in applying the theorems through incorrectly analysing problems with poor argument or presentation or with substantial computational errors.					
	<b>Fail</b> 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	Lecture-based course				
Course Teaching	Activities Details No. of			No. of Hour		
& Learning Activities	Lectures				3	
					10	
Assessment Methods and Weighting	Methods	·	Details		Weighting in fina course grade (%	
	Assignme	ents			5	
	Examinat	tion			50	

		I	
Required/recommended reading and online materials	TBC		

MATH6219 Topics in applie				Academic Year	2014	
Offering Department	Mathema	tics		Quota		
Course Co-ordinator	Dr S P Yung, Mathematics (spyung@hku.hk)					
Teachers Involved	Dr S P Yung, 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 mathematics. This course would lay a foundation for students in studying more advanced mathematica courses.					
Course Contents & Topics	<ol> <li>Generalized functions (also called distributions), delta function, generalized Fourier Transform. Applications to differential equations, Fundamental solution, Green's function.</li> <li>Sobolev spaces, Sobolev Embedding Theorem, Trace.</li> <li>Hilbert space linear operator theory (bounded operators, compact operators, closed unbounded operators), spectral theory. Applications to differential equations (infinitesimal generator, semigroup of linear operators).</li> <li>Applications to optimization problems.</li> <li>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).</li> </ol>					
Course Learning Outcomes		ssful completion of this course, students	•••			
<b>3</b>	<ol> <li>Use generalized functions and their Fourier transform on practice problems.</li> <li>Understand Sobolev spaces and how to use them in the process of solving differential equations.</li> <li>Understand Hilbert space linear operator theory and be able to use it in solving differential equations.</li> <li>Know how to apply these results to optimization problems.</li> </ol>					
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in MATH3401 Analysis I and MATH4404 Functional Analysis, or approval of the course teacher.					
Offer in 2014 - 2015	N			Examination		
Offer in 2015 - 2016	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.					
	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 Demonstrate poor and inadequate understanding by not being able to identify appropriate theorems or their applications, or not being able to complete the solution.					
Course Type	Lecture-b	ased course				
Course Teaching	Activitie	s	Details		No. of Hours	
& Learning Activities	Lectures				36	
	Reading / Self study			100		
Assessment Methods and Weighting	Methods De		Details		eighting in fina ourse grade (%	
	Assignments 50					
	Examina				50	
Required/recommended reading and online materials	TBC					

MATH6501 Topics in algebra (6 credits)		Academic Year	2014	
Offering Department	Mathematics Quota			
Course Co-ordinator	Prof J T Yu, Mathematics (yujt@hku.hk)			
Teachers Involved	Prof J T Yu, Mathematics			
Course Objectives	To provide students specializing in mathematics with the opportunity to study some topics in algebra in			

	greater de	greater depth.			
Course Contents & Topics	quadratic commuta	A selection of advanced topics in algebra such as group theory, rings and modules, Galois theory, quadratic forms, multilinear algebra, algebraic number theory, group representation, introduction to commutative algebra, Grobner basis theory, introduction to algebraic geometry. The selection may vary from year to year.			
Course Learning Outcomes	On successful completion of the course, students should be able to:				
		<ol> <li>Acquire knowledge in the covered topics to considerable depth.</li> <li>If he/she wishes, pursue more advanced studies in areas of algebra.</li> </ol>			
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in M	Pass in MATH4302 Algebra II			
Offer in 2014 - 2015	Y 2nd	sem	Examination	May	
Offer in 2015 - 2016	Υ				
Course Grade	A+ to F	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.			
	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 Demonstrate poor and inadequate understanding by not being able to identify appropriate theorems or their applications, or not being able to complete the solution.				
Course Type	Lecture-b	ased course			
Course Teaching	Activitie	s	Details	No. of Hours	
& Learning Activities	Lectures			36	
	Reading	/ Self study		100	
Assessment Methods and Weighting	Methods	·	Details	Weighting in final course grade (%)	
	Assignments		coursework assessment	50	
	Examina	Examination One 2.5-hour written examination		50	
Required/recommended reading and online materials	To be dec	To be decided by the course instructor.			
Course Website	http://hku	http://hkumath.hku.hk/course/MATH6501/			

MATH6502 Topics in appli	ed discrete	mathematics (6 credits)	Academic Year	2014			
Offering Department	Mathemati	cs	Quota				
Course Co-ordinator	Prof W Za	Prof W Zang, Mathematics (wzang@maths.hku.hk)					
Teachers Involved	Prof W Zang, Mathematics						
Course Objectives	To provide	students with the opportunity to study some further topics i	n applied discrete ma	athematics.			
Course Contents & Topics	A selection of advanced topics in discrete mathematics, which may include algebraic coding theory, cryptography, discrete optimization, extremal combinatorics, and algebraic and probabilistic methods in discrete mathematics. The selection may vary from year to year.						
Course Learning Outcomes	On successful completion of the course, students should be able to:  1. Demonstrate knowledge and understanding of some research areas of applied discrete mathematics.  2. Solve various discrete mathematics problems using some advanced techniques.						
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in M	ATH3301 Algebra I and MATH3600 Discrete mathematics					
Offer in 2014 - 2015	N	N Examination					
Offer in 2015 - 2016	N	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 r	ninor computational errors.			
	С		ding of key concepts and ideas by being able to one in applying the theorems through incorrectly and or 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 applications, or not being able to complete the solution.				
Course Type	Lecture-b	ased course					
Course Teaching & Learning Activities	Activities		Details	No. of Hours			
a Learning Activities	Lectures			36			
	Reading / Self study			100			
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)			
	Assignments		coursework assessment	50			
	Examination		One 2.5-hour written examination	50			
Required/recommended reading and online materials	Instructor	Instructor's lecture notes.					
Course Website	http://hku	math.hku.hk/course/MATH6502/					

MATH6503 Topics in math credits)	nematical p	programming and optimization (6	Academic Yea	r 2014		
Offering Department	Mathema	tics	Quota			
Course Co-ordinator	Prof W Za	ang, Mathematics (wzang@maths.hku.hk)				
Teachers Involved	Prof W Za	ang, Mathematics				
Course Objectives		A study in greater depth of some special topics in mathematical programming or optimization. It is mainly intended for students in Operations Research or related subject areas.				
Course Contents & Topics	multi-obje	A selection of advanced topics, which may include convex, quadratic, geometric, stochastic programming, multi-objective programming and goal programming; or discrete and combinatorial optimization. The selection may vary from year to year.				
Course Learning Outcomes	Undersoptimizati     Demor	On successful completion of the course, students should be able to:  1. Understand the advanced concept and approach of the mathematical programming topic(s) and/or optimization approaches as appropriate in Operations Research.  2. Demonstrate knowledge and understanding of the underlying theory and techniques of the various formulations and algorithms plus their extensions.				
Pre-requisites (and Co-requisites and Impermissible combination)		MATH3901 Operations research I, MATH39 is research II	904 Introduction to optimization	n and MATH4902		
Offer in 2014 - 2015	N		Examination			
Offer in 2015 - 2016	Υ		'	· ·		
Course Grade	A+ to F					
Grade Descriptors	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.					
	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	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 tapplications, or not being able to complete the solution		iate theorems or their		
Course Type	Lecture-b	ased course				
Course Teaching	Activitie	s Deta	ils	No. of Hours		
& Learning Activities	Lectures			36		
	Reading	/ Self study		100		
Assessment Methods and Weighting	Methods	Deta	ils	Weighting in fina		

	Assignments	coursework assessment based on assignments and two class tests	50			
	Examination	One 2.5-hour written examination	50			
Required/recommended reading and online materials	M.S. Bazaraa and C.M. Shetty, Nonlinear Programming, 2nd edition (John Wiley & Sons, 1993) S.P. Bradley, A.C. Hax and T. Magnanti, Applied Mathematical Programming (Addison-Wesley, 1977) N. Christofides et al (ed.): Combinatorial Optimization (John Wiley & Sons, 1979) S.S. Rao, Optimization Theory and Applications (Wiley Eastern Ltd., 1978) G. Nemhauser and L. Wolsey, Integer and Combinatorial Optimization (John Wiley & Sons, 1988) J.P. Ignizio: Introduction to Linear Goal Programming (Beverly Hills: Sage, 1985)					
Course Website	http://hkumath.hku.hk/course/MATH6	http://hkumath.hku.hk/course/MATH6503/				

MATH6504 Geometric top	ology (6 cre	edits)	A	cademic Year	2014	
Offering Department	Mathemati	cs	Q	uota		
Course Co-ordinator	Dr Z Hua,	Mathematics (huazheng@maths.hku.hk	k)			
Teachers Involved	Dr Z Hua,	Mathematics				
Course Objectives		e gives a geometric introduction to sor t will be on the geometric motivations ar			y. The emphasis	
Course Contents & Topics		Compactness. Connectedness. The fiftheory and applications of simplicial ho				
Course Learning Outcomes	1. Underst	On successful completion of the course, students should be able to:  1. Understand basic ideas and constructions which are important both in pursuing the deeper theories as well as in many applications in algebraic topology.  2. Understand the ideas of attaching space, complexes, lifting and extension properties, and surgery on manifolds.				
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in Ma	ATH3301 Algebra I and MATH3401 Ana	alysis I			
Offer in 2014 - 2015	N		E	xamination		
Offer in 2015 - 2016	Υ	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 Demonstrate poor and inadequate understanding by not being able to identify appropriate theorems or their applications, or not being able to complete the solution.					
		applications, or not being able to complete the	solution.		theorems or their	
Course Type	Lecture-ba	applications, or not being able to complete the ased course	solution.		theorems or their	
Course Teaching	Lecture-ba	ased course	solution.  Details		No. of Hours	
Course Type Course Teaching & Learning Activities		ased course				
Course Teaching	<b>Activities</b> Lectures	ased course			No. of Hours	
Course Teaching	<b>Activities</b> Lectures	ased course			No. of Hours	
Course Teaching & Learning Activities  Assessment Methods	Activities Lectures Reading	ased course  Self study	Details	Co	No. of Hours 36 100 eighting in final ourse grade (%)	
Course Teaching & Learning Activities  Assessment Methods	Activities Lectures Reading /	seed course  Self study	Details  Details	nt	No. of Hours 36 100 eighting in final ourse grade (%)	
Course Teaching & Learning Activities  Assessment Methods	Activities Lectures Reading / Methods Assignme Examinat M.A. Arms	seed course  Self study	Details  Details  coursework assessment One 2.5-hour written extends  UTM)	nt	No. of Hours 36 100 eighting in final	

MATH6505 Real analysis (6	Academic Year	2014			
Offering Department	Mathematics	Quota			
Course Co-ordinator	Prof W S Cheung, Mathematics (wscheung@maths.hku.hk)				
Teachers Involved	ers Involved Prof W S Cheung, Mathematics				

Course Objectives	The aim of integral.	The aim of the course is to introduce the basic ideas and techniques of measure theory and the Lebesgue integral.				
Course Contents & Topics	- The Lebe - Different continuity - General convergen	<ul> <li>Lebesgue Measure on R: Measurable sets and Lebesgue measure, Measurable functions</li> <li>The Lebesgue Integral: The Lebesgue integral, modes of convergence</li> <li>Differentiation and Integration: Functions of bounded variation, Differentiation of an integral, absolute continuity</li> <li>General Measure and Integration Theory: Measurable spaces, measurable functions, integration, convergence theorems, the Radon-Nikodym theorem</li> <li>The L^p Spaces: The L^p spaces, convergence and completeness, bounded linear functionals</li> </ul>				
Course Learning Outcomes	Describ     Construuseful inte	On successful completion of the course, students should be able to:  1. Describe basic properties of Lebesgue measure and measurable functions.  2. Construct the Lebesgue integral, elucidate its basic properties and appreciate the existence of other useful integration theories besides Riemann's.  3. Understand the basic features of L^p spaces.				
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in Ma	ATH3401 Analysis I				
Offer in 2014 - 2015	Y 2nd	Y 2nd sem Examination May				
Offer in 2015 - 2016	Υ					
Course Grade	A+ to F					
Grade Descriptors	A	A Demonstrate a thorough understanding of all concepts and ideas by being able to draw complex connections among various concepts and apply the theorems through correctly analysing problems, clearly and elegantly presenting correct logical reasoning and argumentation, and with some innovative approaches to solving problems.				
	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, reasoning, identifying the appropriate theorems, applications, or presentation.				
	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 acceptable argument and presentation.				
	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.				
	Fail	Fail Demonstrate poor and inadequate understanding by not being able to identify appropriate theorems or their applications, and not being able to complete the solution.				
Course Type	Lecture-ba	ased course				
Course Teaching & Learning Activities	Activities	5	Details	No. of Hours		
a Learning Activities	Lectures			36		
	Reading /	Self study		100		
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)		
	Assignme	ents	coursework assessment comprising one mid-term test and assignments	30		
	Examinat	ion	One 2.5-hour written final examination 7			
Required/recommended reading and online materials		en: Real Analysis, Collier MacMillan Real and Complex Analysis, McGraw	Hill			
Course Website	http://hkun	nath.hku.hk/course/MATH6505/				

MATH7101 Intermediate co	mplex analysis (6 credits)	Academic Year	2014		
Offering Department	Mathematics	Quota			
Course Co-ordinator	Prof N Mok, Mathematics (nmok@hku.hk)				
Teachers Involved	Prof N Mok, Mathematics				
Course Objectives	The objective is to familiarize students with analytic, algebraic and geometric concepts and techniques in the study of Complex Analysis in a single variable beyond an introductory course on functions of a complex variable.				
Course Contents & Topics	In the course we study meromorphic functions on compact Rieman surfaces using analytic and algebraic techniques. Topics on m constructions of meromorphic functions on compact Riemann surfaces the Mittag-Leffler Problem and the Weierstrass Problem on compa Riemann surfaces. In the course of study of meromorphic function cohomology theories in terms of differential forms will be introduced included. Examples of possible topics include normal families, the Riemann surfaces.	eromorphic function es, elliptic functions, l ct Riemann surface ens, sheaf cohomolo d. A choice of othe emann Mapping The	is include the Poincare series, s and on open ogy theory and r topics will be brem, geometric		
Course Learning Outcomes	On successful completion of this course, students should be able to:				
	1. Deal with rational functions on the Riemann Sphere and deal	with elliptic function	ns, equivalently		

	2. Formu or cohom 3. Identif functions 4. Identif	meromorphic functions on elliptic curves.  2. Formulate various classical existence problems on meromorphic functions and reduce them to an or cohomological problems, being able to solve them in certain typical cases.  3. Identify the key arguments in the proofs of various mathematical results concerning meromo functions on compact Riemann surfaces or on plain domains.  4. Identify the key elements in the theoretic foundation of various additional topics covered in the cound to make use of them in solving problems.				
Pre-requisites (and Co-requisites and Impermissible combination)	A first co the instru	urse in Complex Analysis such as MAT ctor.	H3403 Functions of a Com	ıplex Variable	e, and approval by	
Offer in 2014 - 2015	Y 1s	t sem	Exa	mination	Dec	
Offer in 2015 - 2016	Υ					
Course Grade	A+ to F					
Grade Descriptors	A	theorems and their applications through corre	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	Demonstrate poor and inadequate understanding by not being able to identify appropriate theorems or their applications, or not being able to complete the solution.				
Course Type	Lecture-b	pased course				
Course Teaching	Activitie	9S	Details		No. of Hours	
& Learning Activities	Lectures	5			36	
	Reading	/ Self study			100	
Assessment Methods and Weighting	Method	s	Details		Weighting in final course grade (%)	
	Assignm	nents			50	
	Examina	ation	Final examination		50	
Required/recommended reading and online materials	O. Forste J.B. Conv	Examination Final examination 50  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.				

MATH7505 Real analysis (	credits	s)			Academic Year	2014		
Offering Department	Mathem	matics			Quota			
Course Co-ordinator	Prof W	S Cheung, Ma	athematics (wscheung@mati	hs.hku.hk)				
Teachers Involved	Prof W	Prof W S Cheung, Mathematics						
Course Objectives		The aim of the course is to introduce the basic ideas and techniques of measure theory and the Lebesgue integral.						
Course Contents & Topics	- The Le - Differe continui - Gene converg	- Lebesgue Measure on R: Measurable sets and Lebesgue measure, Measurable functions - The Lebesgue Integral: The Lebesgue integral, modes of convergence - Differentiation and Integration: Functions of bounded variation, Differentiation of an integral, absolute continuity - General Measure and Integration Theory: Measurable spaces, measurable functions, integration convergence theorems, the Radon-Nikodym theorem - The L⁴p Spaces: The L⁴p spaces, convergence and completeness, bounded linear functionals						
Course Learning Outcomes	1. Desc 2. Cons useful ir	cribe basic pro struct the Leb integration the	etion of the course, students operties of Lebesgue measure lesgue integral, elucidate its ories besides Riemann's. Isic features of L^p spaces.	e and measurable f		existence of othe		
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in	n MATH3401 A	Analysis I					
Offer in 2014 - 2015	Y 2	2nd sem			Examination	May		
Offer in 2015 - 2016	Υ							
Course Grade	A+ to F	•						
Grade Descriptors	A	various co	ate a thorough understanding of all concepts and apply the theorems thrical reasoning and argumentation, a	ough correctly analysin	g problems, clearly and	d elegantly presenting		

	В	and their applications through correctly analysing problems, but with some minor inadequacies in argur reasoning, identifying the appropriate theorems, applications, or presentation.					
	С	Demonstrate an acceptable understanding of key concepts and ideas by being able to correctly identify appritheorems, but with some inadequacies in applying the theorems through incorrectly analysing problems acceptable argument and presentation.					
	D	Demonstrate some understanding of key theorems, but with substantial inadequacies poor argument or presentation.					
	Fail		Demonstrate poor and inadequate understanding by not being able to identify appropriate theorems or applications, and not being able to complete the solution.				
Course Type	Lecture-b	ased course					
Course Teaching & Learning Activities	Activities		Details	No. of Hours			
a Learning Activities	Lectures			36			
	Reading / Self study			100			
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)			
	Assignments		coursework assessment comprising one mid-term test and assignments	30			
	Examination		One 2.5-hour written final examination	70			
Required/recommended reading and online materials		H.L. Royden: Real Analysis, Collier MacMillan W. Rudin: Real and Complex Analysis, McGraw Hill					
Course Website	http://hkur	math.hku.hk/course/MATH6505/					

PHYS1050 Physics for eng		nadonio (o oreano)		Academic Year	2014	
Offering Department	Physics			Quota		
Course Co-ordinator	Prof M H	Xie, Physics (mhxie@hku.hk)				
Teachers Involved		Xie, Physics u, Physics				
Course Objectives		This course offers a comprehensive training of physics for engineers. It covers the major physical laws of mechanics, electricity and magnetism. A calculus-based approach is adopted.				
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 of Motion, Friction, Curvilinear and Circular Motion on a Plane, Force, Impulse and Momentum, Force Polygon and Static Equilibrium, Work and Energy, System of Particles, Moment of Inertia and Rotation of a Rigid Body, Simple Harmonic Motion and Pendulum; Electrostatic Fields and Potential, Gauss's Law, DC circuits, Magnetic field due to Moving Charges, Force on a Moving Charge in Magnetic Field, Biot-Savart law, Ampere's law, Electromagnetic Induction, Faraday's Law, Eddy Currents, AC circuits, Phases in Capacitive and Inductive Circuits, Power, DC and AC Generators, Transformer.				
Course Learning Outcomes	On succe	ssful completion of this course, stud	lents should be able to:			
	<ol> <li>Apply t</li> <li>Analyze</li> </ol>	pe and explain the physical principle hese principles to situations of the p e and solve basic problems using th e and interpret experimental data to	physical and engineering te calculus-based approa	world. ach.		
Pre-requisites (and Co-requisites and Impermissible combination)		r above in HKDSE Physics or Comb rse is exclusive for Engineering stud		cs components or e	quivalent	
Offer in 2014 - 2015	Y 1st	sem 2nd sem		Examination	Dec May	
Offer in 2015 - 2016	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. Apply highly effective lab skills and techniques. Critical use of data and results to draw appropriate and insightful conclusions.					
	В	Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills. Apply effective lab skills and techniques. Correct use of data of results to draw appropriate conclusions.				
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills. Apply moderately effective lab skills and techniques. Mostly correct but some erroneous use of data and results to draw appropriate conclusions.				
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills. Apply partially effective lab skills and techniques. Limited ability to use data and results to draw appropriate conclusions.				
	Fail	Fail  Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective. Apply minimally effective or ineffective lab skills and techniques. Misuse of data and results and/or unable to draw appropriate conclusions.				
Course Type	Lecture w	rith laboratory component course				
Course Teaching	Activitie	S	Details		No. of Hours	
& Learning Activities	Lectures				36	
	Laborato				6	
	Tutorials	•			8	
		/ Self study			72	
Assessment Methods and Weighting	Methods	,	Details		Veighting in fina	
	A ·	anta.			course grade (%)	
	Assignm		0 h '''		10	
	Examina		2-hour written exa	m	7(	
		ory reports			10	
	Test				10	
Required/recommended reading and online materials	R. Serwa	otes provided by Course Coordinatory and J.W. Jewett: Physics for Scier ght: Physics for Scientists and Engir	ntists and Engineers (Th		dition)	

PHYS1055 How things work	Academic Year	2014	
Offering Department	Physics	Quota	
Course Co-ordinator	Dr M K Yip, Physics (mankit@bohr.physics.hku.hk)		

Teachers Involved	Dr M K Yi	p, Physics				
Course Objectives	life. The c Logical th Students	This course is designed for students in all disciplines and all years who are curious about science in daily life. The course covers the working principles and mechanisms of the things and phenomena around us. Logical thinking and appreciation of science are emphasized with mathematics kept at a minimum. Students are trained to develop scientific intuition and to understand that many "magical" things in everyday life can be predictable.				
Course Contents & Topics	application imaging for the mo	Topics include: the science in the household and the science of driving, sports and amusement. Daily applications are explored with simple and lucid explanations. Developments in optical recording, medical imaging for diagnosis and the magnetic levitated trains in public transportation are introduced as examples of the modern technology. Contents of the course are constantly updated to reflect the advances in modern science and technology.				
Course Learning Outcomes	1. Describ issues in c 2. Demons 3. Criticize	On successful completion of this course, students should be able to:  1. Describe and discuss the physical principles that are behind the household appliances and the scientific issues in daily life.  2. Demonstrate their knowledge to related topics qualitatively.  3. Criticize and express views in logical and effective ways.  4. Recognize the significance of science and technology.				
Pre-requisites (and Co-requisites and Impermissible combination)	NIL					
Offer in 2014 - 2015	Y 2nd	Isem		Examination	May	
Offer in 2015 - 2016	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	Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.				
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.				
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.				
	Fail	Fail  Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.				
Course Type	Lecture-ba	ased course				
Course Teaching	Activities	S	Details		No. of Hours	
& Learning Activities	Lectures				36	
	Tutorials				8	
	Reading	/ Self study			80	
Assessment Methods and Weighting	Methods		Details		Weighting in final course grade (%)	
	Assignme	ents			25	
	Examinat	tion	2-hour written example	m	50	
	Presenta	tion			25	
Required/recommended reading and online materials		otes provided by Course Coordinator omfield: How Things Work: The Phys	ics of Everyday Life	(John Wiley & Sc	ons, Inc, 2008, 3rd	
Course Website	http://www	/.physics.hku.hk/~phys1055/				

PHYS1056 Weather and c	limate (6 credits)	Academic Year	2014		
Offering Department	Physics	Quota			
Course Co-ordinator	Dr K M Lee, Physics (kmlee@lily.physics.hku.hk)				
Teachers involved	Dr K M Lee, Physics Dr T C Lee, Hong Kong Observatory Dr P W Li, Hong Kong Observatory Mr W K Wong, Hong Kong Observatory				
Course Objectives	Weather and climate play an important role in human activities a introduce to students the fundamentals of weather, climate and clim in the scientific and technological advancements.				
Course Contents & Topics	The course will encompass topics on: basic physical principles temperature, humidity, cold/warm fronts, thunderstorms and trop analysis, forecast and climate. Through real life examples, stu	ical cyclones; introd	uctory weather		
	400				

Course Learning Outcomes	Experts fi weather climatolog visit to the and clima	elimate science and interpretation of norm the Hong Kong Observatory (HI forecasts, public weather services gy of Hong Kong, and climate change HKO to study the meteorological fate.	KO) will participate in the cours , local severe weather phen ge. They will also supervise co cilities and understand the ope	se to cover comena, tr ourse proje	aspects on daily opical cyclones, cts that involve a	
Course Learning Outcomes	1. Recall 2. Apply internet o 3. Identify the world 4. Explair	the basic principles of weather and cl the principles to interpret weather / r media. r and explain the differences of weath	imate. climate information, for exampler and climate in Hong Kong a and its potential impacts.			
Pre-requisites (and Co-requisites and Impermissible combination)	NIL					
Offer in 2014 - 2015	N		Exam	ination		
Offer in 2015 - 2016	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.					
	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	Demonstrate little or no evidence of com outcomes. Lack of analytical and critical a knowledge to solve problems. Organization	bilities, logical and coherent thinking. S	how very little	or no ability to apply	
Course Type	Lecture-b	ased course				
Course Teaching	Activitie	S	Details		No. of Hours	
& Learning Activities	Lectures				36	
	Tutorials				8	
	Reading	/ Self study			80	
Assessment Methods and Weighting	Methods	5	Details		Veighting in final course grade (%)	
	Assignm	ents			25	
	Examina	tion	2-hour written exam		50	
	Test				25	
Required/recommended reading and online materials		otes provided by Course Coordinator Lutgens and Edward Tarbuck: The A		Hall, 2013)		
Course Website	http://www	v.physics.hku.hk/~phys0629/				
	1	1 7				

PHYS1057 Kitchen science	e (6 credits)	Academic Year	2014			
Offering Department	Physics	Quota				
Course Co-ordinator	Prof A B Djurisic, Physics (dalek@hku.hk)					
Teachers Involved	Prof A B Djurisic, Physics	Prof A B Djurisic, Physics				
Course Objectives	The course aims to improve students' understanding of basic science behind the common daily activities related to food and cooking and to develop their critical thinking skills.					
Course Contents & Topics	The course will introduce basic scientific concepts and principles methods of food preparation, as well as kitchen tools. The introduced of and practical demonstrations.  The topics include: basic food molecules (water, carbohydrates, fats, p foams and bubbles (various examples, beer, sodas, ice-cream); co sauces, jelly); crystallization (sugar, sugar syrups, honey, chocolate cooking processes and chemical reactions (Maillard reactions, carame rising dough with application to cakes, bread and cookies; fermentatical dairy products, tofu); pH values in cooking, natural and artificial f molecular gastronomy (novel flavors and textures); principles of oper stick cookware, pressure cookers, induction heating ranges, microwave	concepts will be illust rotein); lloids, emulsions, ge ); taste and flavor (i lization, etc.); chemic on (alcoholic bevera ood colorings, culina ation of kitchen tools	rated in recipes elation (various herbs, spices); cal reactions for ges, fermented ary curiosities;			

Course Learning Outcomes	1. Describe 2. Explain 3. Illustrate 4. Analyze	how preparation method affects	n tools encountered in daily life. esses involved in food preparation		for performing	
Pre-requisites (and Co-requisites and Impermissible combination)	NIL					
Offer in 2014 - 2015	N		Exa	mination		
Offer in 2015 - 2016	N					
Course Grade	A+ to F	A+ to F				
Grade Descriptors	A	course learning outcomes. Show strong	advanced level of extensive knowledge ar ng analytical and critical abilities and logic e to a wide range of complex, familiar an onal skills.	al thinking, with e	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	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	outcomes. Lack of analytical and critic	command of knowledge and skills require al abilities, logical and coherent thinking. ation and presentational skills are minimal	Show very little o	r no ability to apply	
Course Type	Lecture-ba	sed course				
Course Teaching	Activities		Details		No. of Hours	
& Learning Activities	Lectures				36	
	Tutorials		inlcuding demonstration hours)	(12	24	
	Reading /	Self study			72	
Assessment Methods and Weighting	Methods		Details		eighting in final ourse grade (%)	
	Assignme	nts	essay & student presentat	tions	70	
	Examinati	on			30	
Required/recommended reading and online materials	T. Lister ar S. T. Beck R. L. Wolk 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: The 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	g in physics (6 credits)	Academic Year	2014		
Offering Department	Physics	Quota			
Course Co-ordinator	Dr K M Lee, Physics (kmlee @lily.physics.hku.hk)				
Teachers Involved	Dr K M Lee, Physics				
Course Objectives	This course provides a basic training on the methods and tools that are commonly used in physics. It prepares students the necessary knowledge to learn the subject. Students will explore the basic ideas, methods and skills through tackling physical problems. It is complete in itself, or may also be followed by Methods in Physics I. This course can be regarded as a survival guide in physics study.				
Course Contents & Topics	This course introduces the principles and theories of various tools that are useful to read physics and solve its problems. Topics include: Dimensional analysis, algebraic method, vectorial method, graphical method, calculus approach and geometric approach, etc. Applications to physical systems and various problem solving skills are discussed.				
Course Learning Outcomes	On successful completion of this course, students should be able to:  1. State physical systems by the language of mathematics and emptoread physics.  2. Apply calculus to solve problems.  3. Review the features of various solving tools in physics as well as solving physical problems.  4. Describe the connections between mathematical equations and p. Formulate and operate physical problems both qualitatively and q. Interpret and judge the physical meaning of result after calculation.	plan and select appropriately by the plan and select appropriately by sical problems. Use the problems and the problems are the problems and the problems are the problems are the problems are the problems are the problems are the problems are the problems.			

Impermissible combination)	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.				
Offer in 2014 - 2015	Y 2n	d sem	Exami	ination	May
Offer in 2015 - 2016	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 observation skills and techniques. Critical use of data and results to draw appropriate and insightful conclusions.				
	В	the course learning outcomes. Show apply knowledge to familiar and some	a broad range of knowledge and skills re evidence of analytical and critical abilities e unfamiliar situations. Apply effective orga techniques. Correct use of data of results to	s and logical than and and	hinking, and ability to dispresentational skills.
	С	learning outcomes. Show evidence o knowledge to most familiar situation	command of knowledge and skills required from analytical and critical abilities and some analytical and critical abilities and some fractive organization and techniques. Mostly correct but some fractions and techniques.	logical thinking nal and preser	g, 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.				
	Fail	outcomes. Lack of analytical and critic knowledge to solve problems. Organ	command of knowledge and skills require cal abilities, logical and coherent thinking. S sization and presentational skills are minir skills and techniques. Misuse of data a	Show very little mally effective	or no ability to apply or ineffective. Apply
Course Type	Lecture v	vith laboratory component course			
Course Teaching	Lecture v		Details		No. of Hours
Course Teaching		es	Details		No. of Hours
Course Teaching	Activitie	es S	Details		
Course Teaching	Activitie	es S Dory	Details		36
Course Teaching	Activitie Lectures Laborato Tutorials	es S Dory	Details		36 6
Course Type Course Teaching & Learning Activities  Assessment Methods and Weighting	Activitie Lectures Laborato Tutorials	es Sorry Sorry Sorry Sor	Details  Details		36 6 8
Course Teaching & Learning Activities  Assessment Methods	Activities Lectures Laborato Tutorials Reading	es s pry s / Self study			36 6 8 80 Weighting in final
Course Teaching & Learning Activities  Assessment Methods	Activitie Lectures Laborato Tutorials Reading Methods	ess S S S Ory S I / Self study S Dents			36 6 8 80 Weighting in final course grade (%)
Course Teaching & Learning Activities  Assessment Methods	Activitie Lectures Laborato Tutorials Reading Methods Assignm Examina	ess S S S Ory S I / Self study S Dents	Details		36 6 8 80 Weighting in final course grade (%)
Course Teaching & Learning Activities  Assessment Methods	Activitie Lectures Laborato Tutorials Reading Methods Assignm Examina	ess s s pry s // Self study s nents stion	Details		36 6 8 80 Weighting in final course grade (%) 20 50
Course Teaching & Learning Activities  Assessment Methods	Activities Lectures Laborato Tutorials Reading  Methods Assignm Examina Laborato Test	ess s s pry s // Self study s nents stion	Details  2-hour written exam		36 6 8 80 Weighting in final course grade (%) 20 50

PHYS1240 Physics by inqu	iry (6 credits)	Academic Year	2014		
Offering Department	Physics	Quota			
Course Co-ordinator	Dr J C S Pun, Physics (jcspun@hku.hk)				
Teachers Involved	Dr J C S Pun, 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	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 physica 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 successful completion of the course, students should be able to 1. Describe and distinguish the concepts and principles in introduce 2. Recognize the underlying physical principles behind various dai 3. Explain physical phenomena using proper physical laws and the 4. Apply simple mathematical techniques for quantitative analysis 5. Analyse data of physics experiments.	tory study of physics. ly life phenomena. eories.	lems.		
Pre-requisites (and Co-requisites and Impermissible combination)	NIL  Not for students with level 3 or above in HKDSE Physics; and PHYS1050 Physics for engineering students or already enrolled in Not for students who have passed in PHYS1250 Fundamental phy	this course; and	•		
Offer in 2014 - 2015	Y 1st sem	Examination	Dec		

Offer in 2015 - 2016	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 familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.					
	В	Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.					
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.					
	D	outcomes. Show evidence of some	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.				
	Fail	Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.					
Course Type	Lecture-l	based course					
Course Teaching	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 (%)			
	Assignn	nents		20			
	Examin	ation	2-hour written exam	50			
	Test			30			
Required/recommended reading and online materials	John D. Paul G. I	Hewitt: Conceptual Physics (Addi	: Introduction to Physics (John Wiley	,			

PHYS1250 Fundamental pl	hysics (6 c	redits)	Academic Year	2014		
Offering Department	Physics		Quota			
Course Co-ordinator	Dr M K Yi	p, Physics <i>(mankit@bohr.physics.hku.hk)</i>				
Teachers Involved	Dr M K Yi	p, Physics				
Course Objectives	students v	This course covers the fundamental blocks in physics in one semester. It serves as a first course to students who are planning to take physics, astronomy, or mathematics/physics as major. It also serves students who intend to take physics or astronomy as minor. Conceptual ideas in physics are emphasized and the mathematical treatment is moderate.				
Course Contents & Topics		Topics include: Mechanics, Wave Motions, Geometric and Physical Optics, Thermodynamics, Electromagnetism, and Modern Physics.				
Course Learning Outcomes	<ol> <li>Describ</li> <li>Apply t</li> <li>world.</li> <li>Analyse</li> </ol>	esful completion of this course, students should be and explain the fundamental physical princip hese principles, together with logical and made and solve problems with the aids of mathemate and interpret experimental data to examine the	oles. thematical reasoning, to situationatics.	ons of the physica		
Pre-requisites (and Co-requisites and Impermissible combination)	Students may be al	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 incompany be allowed to take this course; Not for students who have passed in PHYS1050 Physics for engineering students or already enrolled this accuracy.				
Offer in 2014 - 2015	Y 1st	sem 2nd sem	Examination	Dec May		
Offer in 2015 - 2016	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 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.					
	Apply effective lab skills and techniques. Correct use of data or 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					

			Apply moderately effective organization niques. Mostly correct but some erroneo		
	D	outcomes. Show evidence of some c Show limited ability to apply knowled	nd of knowledge and skills required for att oherent and logical thinking, but with limi ge to solve problems. Apply limited or b active lab skills and techniques. Limited ab	ited analytical and critical abilities.	
	Fail	outcomes. Lack of analytical and critical knowledge to solve problems. Organi	command of knowledge and skills require al abilities, logical and coherent thinking. Sization and presentational skills are minin skills and techniques. Misuse of data a	Show very little or no ability to apply nally effective or ineffective. Apply	
Course Type	Lecture v	with laboratory component course			
Course Teaching & Learning Activities	Activities		Details	No. of Hours	
	Lectures			36	
	Laboratory			6	
	Tutorials			8	
	Reading / Self study			80	
Assessment Methods and Weighting	Method	s	Details	Weighting in final course grade (%)	
	Assignm	nents		10	
	Examina	ation	2-hour written exam	50	
	Laboratory reports			15	
	Test			25	
Required/recommended reading and online materials	Raymono edition)	Lecture notes provided by Course Coordinator Raymond A. Serway and John W. Jewett: Physics for Scientists and Engineers (Thomson, 2011, 8 edition) James S. Walker: Physics (Prentice Hall, 2009, 4th edition)			
Course Website	http://ww	w.physics.hku.hk/~phys1250/			

PHYS1650 Nature of the un	niverse (6 c	credits)	Academic Year	2014		
Offering Department	Physics		Quota			
Course Co-ordinator	Dr K M Lee	e, Physics (kmlee@lily.physics.hku.hk)				
Teachers Involved	Dr K M Lee	Or 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	physics of cosmology and how of	Topics covered include the observational aspect of astronomy (including constellations and planets), the physics of our solar system, and our own Sun, stars and their evolution, galaxies, blackholes, and cosmology. It also provides students with a basic understanding of the relationship of astronomy to life and how our nature works on the macroscopic level. Students are expected to participate actively in the night sky observations.				
Course Learning Outcomes	1. Identify galaxies), 2. Use the 3. Review discovery 4. Apply 9 universal 9 problems. 5. Explain	<ul><li>5. Explain the evolution of stars and the evolution of the universe.</li><li>6. Communicate astronomical problems and solutions using appropriate astronomical terminology an</li></ul>				
Pre-requisites (and Co-requisites and Impermissible combination)	NIL					
Offer in 2014 - 2015	Y 1st	sem 2nd sem	Examination	Dec May		
Offer in 2015 - 2016	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 observation 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 observation 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 mo learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, an knowledge to most familiar situations. Apply moderately effective organizational and presentation moderately effective observation skills and techniques. Mostly correct but some erroneous use of draw appropriate conclusions.			
	D	Demonstrate partial but limited command o outcomes. Show evidence of some cohere Show limited ability to apply knowledge to presentational skills. Apply partially effective to draw appropriate conclusions.	ent and logical thinking, but with limited or backen problems. Apply limited or backens.	ed analytical and critical abilities.  arely effective organizational and
	Fail	Demonstrate little or no evidence of commoutcomes. Lack of analytical and critical ab knowledge to solve problems. Organizatio minimally effective or ineffective observation appropriate conclusions.	ilities, logical and coherent thinking. Sh n and presentational skills are minima	now very little or no ability to apply ally effective or ineffective. Apply
Course Type	Lecture w	rith laboratory component course		
Course Teaching & Learning Activities	Activities		Details	No. of Hours
a Learning Activities	Lectures			36
	Laboratory			12
	Tutorials			8
	Reading / Self study			64
Assessment Methods and Weighting	Methods	3	Details	Weighting in final course grade (%)
	Assignments			25
	Examina	tion	2-hour written exam	50
	Presentation			25
Required/recommended reading and online materials	E. Chaiss	on and S. McMillan: Astronomy Today	(Pearson, 2011)	
Course Website	http://www	v.physics.hku.hk/~nature/		

PHYS2055 Introduction to	relativity (	6 credits)	Academic Year	2014		
Offering Department	Physics		Quota			
Course Co-ordinator	Dr K M Le	Dr K M Lee, Physics (kmlee@lily.physics.hku.hk)				
Teachers Involved	Dr K M Le	ee, Physics				
Course Objectives		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, Exa	Topics include: "Common-sense" concepts of space and time versus Einstein's conceptions of space and time, Examples of time dilation and space contraction, Paradoxes of relativity including the famous twir paradox and the "pole-in-the-barn", Four vectors and Lorentz invariant.				
Course Learning Outcomes	On succe	ssful completion of this course, students should be ab	e to:			
	<ol> <li>State th</li> <li>Explain</li> <li>Describ</li> </ol>	<ol> <li>Recall the setup and significance of Michelson-Morley experiment.</li> <li>State the basic postulates and the spacetime concept of special relativity.</li> <li>Explain time dilation and length contraction.</li> <li>Describe Lorentz transformation and its applications.</li> <li>State the resolution of the twin and pole-in-the-barn paradoxes.</li> </ol>				
Pre-requisites (and Co-requisites and mpermissible combination)		Pass in PHYS1250 Fundamental physics or PHYS1150 Problem solving in physics or PHYS1050 Physic for engineering students				
Offer in 2014 - 2015	Y 2nd	i sem	Examination	May		
Offer in 2015 - 2016	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.					
	С	learning outcomes. Show evidence of some analytical and crit	ical abilities and logical thinkin	g, and ability to apply		
	D	learning outcomes. Show evidence of some analytical and crit	ical abilities and logical thinkin e organizational and presentati Ils required for attaining some king, but with limited analytica	g, and ability to apply onal skills. of the course learning I and critical abilities		

Course Type	Lecture-based course		
Course Teaching & Learning Activities	Activities	Details	No. of Hours
a Learning Activities	Lectures		36
	Tutorials		12
	Reading / Self study		80
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)
	Assignments		25
	Examination	2-hour written exam	50
	Test		25
Required/recommended reading and online materials	Lecture notes provided by Course Coordin Robert Resnick and David Halliday: Basic Pub., 1992, 2nd revised edition) Edwin F. Taylor and John A. Wheeler: Freeman, 1992, 2nd edition)	Concepts in Relativity and Early Q	, ,

PHYS2150 Methods in phy	⁄sics I (6 cr	edits)	Aca	ademic Year	2014	
Offering Department	Physics		Qu	ota		
Course Co-ordinator	Dr F K Ch	ow, Physics (judychow@hku.hk)				
Teachers Involved	Dr F K Ch	Dr F K Chow, Physics				
Course Objectives		se provides students with experience in physics. It is complete in itself, or may				
Course Contents & Topics	particle dy dimension exponenti variable fu cylindrical	Solutions of ordinary differential equations in first, second and higher orders and their applications in particle dynamics, circuit theories and nuclear physics; Principles of vectors; Analytic geometry in three dimensions; Vector functions; Cartesian, cylindrical and spherical coordinates; Complex numbers, exponential functions and the mathematical representation of waves; Partial derivatives, extremes of mult variable functions and the Taylor series in two-variable functions; Double and triple integrals in Cartesian cylindrical and spherical coordinates; Change of variables and the Jacobians; Calculations of centers o mass, moments of inertia and electric potentials.				
Course Learning Outcomes	1. Review	ssful completion of this course, students the theory and principles of mather		mpare the fea	tures of various	
	State at     Demons	e the connections between mathematicand set up mathematical equations to destrate knowledge of choosing correct so and judge the physical meaning of res	scribe the dynamics and clution of mathematical ed	evolution of phy	/sics systems.	
Pre-requisites (and Co-requisites and Impermissible combination)		Pass in PHYS1150 Problem solving in physics or MATH1011 University mathematics I or MATH101 University mathematics II or MATH1851 Calculus and ordinary differential equations				
Offer in 2014 - 2015	Y 1st	sem	Exa	amination	Dec	
Offer in 2015 - 2016	Υ	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.					
	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	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 commar outcomes. Lack of analytical and critical abiliti knowledge to solve problems. Organization an	es, logical and coherent thinking	ng. Show very little	or no ability to apply	
Course Type	Lecture-ba	ased course				
Course Teaching	Activities		Details		No. of Hours	
& Learning Activities	Lectures				36	
	Tutorials				12	
	Reading	/ Self study			80	
Assessment Methods	Methods		Details	V	eighting in final	

	Assignments  Examination	2 hour written exam	15 50
	Test	2 Hour written exam	35
Required/recommended reading and online materials	J. Hass, M. D. Weir, and G. B. T edition) M. R. Spiegel: Schaum's Outline 2009) K. F. Riley, M. P. Hobson, and	e Coordinator ranced Engineering Mathematics (McGraw-Hill, 19 homas: University Calculus: Early Transcendenta e of Advanced Mathematics for Engineers and S S. J. Bence: Mathematical Methods for Physic le University Press, 2006, 3rd edition)	Is (Pearson, 2011, 2nd cientists (McGraw-Hill,
Course Website	http://www.physics.hku.hk/~phys2	2150/	

ysics II (6 c	credits)		Academic Year	2014	
Physics			Quota		
Dr F C C	Dr F C C Ling, Physics (ccling@hku.hk)				
Dr F C C	Ling, Physics				
integrals, divergend classical matrices: diagonaliz	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.				
1. Review methods. 2. Describ 3. State a 4. Demon 5. Solve w	<ol> <li>Describe the connections between mathematical equations and physical problems.</li> <li>State and set up mathematical equations to describe the dynamics and evolution of physics systems.</li> <li>Demonstrate knowledge of choosing correct solution of mathematical equations.</li> <li>Solve various problems and operate the calculations with computer.</li> </ol>				
	Pass in PHYS1150 Problem solving in physics or MATH1011 University mathematics I or MATH1011 University mathematics II or MATH1851 Calculus and ordinary differential equations				
Y 2nd	d sem		Examination	May	
Υ	Υ				
A+ to F					
В	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.				
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	outcomes. Lack of analytical and critical al	bilities, logical and coherent	thinking. Show very little	or no ability to apply	
Lecture-b	ased course				
Activitie	s	Details		No. of Hours	
Lectures				30	
Tutorials				1:	
Reading / Self study				8	
Reading	/ Och Study				
Methods	•	Details			
Methods	; S	Details		leighting in fina ourse grade (%	
	ents	Details  2-hour written exar	С	ourse grade (%	
	Physics Dr F C C Dr F C C This coun problems A review integrals, divergence classical matrices: diagonalize finding rown on succe 1. Review methods. 2. Descrit 3. State at 4. Demont 5. Solve v. 6. Interpret Pass in Funiversity Y 2nd Y A+ to F A B C D Fail Lecture-b Activitie Lectures	Dr F C C Ling, Physics (ccling@hku.hk)  Dr F C C Ling, Physics  This course provides students with experien problems in physics. It is complete in itself, or not a review on coordinate systems in three direction integrals, surface integrals and volume integrals, surface integrals and volume integrals, surface integrals and volume integrals, surface integrals and volume integrals and electrodynamics; Vec matrices: Hermitian matrices and unitary matrices: Hermitian matrices and unitary matrices: Hermitian matrices, Applications of matrices; Applications of matrices; Applications of matrices; Applications of matrices, applications of matrices, applications of matrices, and set up matrices of choosing correct solutions. State and set up mathematical equations to 4. Demonstrate knowledge of choosing correct 5. Solve various problems and operate the calc 6. Interpret and judge the physical meaning of Pass in PHYS1150 Problem solving in physis University mathematics II or MATH1851 Calcul Y 2nd sem  Y  A+ to F  A Demonstrate thorough mastery at an advactourse learning outcomes. Show strong and thought, and ability to apply knowledge to presentational skills.  B Demonstrate general but incomplete compositional skills.  B Demonstrate partial but limited command outcomes. Show evidence of some cohe Show limited ability to apply knowledge presentational skills.  Fail Demonstrate little or no evidence of comoutcomes. Show evidence of some cohe Show limited ability to apply knowledge presentational skills.  Lecture-based course  Activities  Lectures	Physics Dr F C C Ling, Physics (ccling@hku.hk) Dr F C C Ling, Physics This course provides students with experience in using mathema problems in physics. It is complete in itself, or may also be taken after A review on coordinate systems in three dimensions; Gradient, di integrals, surface integrals and volume integrals; Conservative field divergence theorem and the Stokes' theorem; Curvilinear coordinate classical mechanics and electrodynamics; Vector spaces and matrix matrices: Hernitian matrices and unitary matrices, etc; Quadratic diagonalization of matrices; Applications of matrix theory in physics finding roots of equations; Numerical differentiation and integration.  On successful completion of this course, students should be able to:  1. Review the theory and principles of mathematical methods an methods.  2. Describe the connections between mathematical equations and phy.  3. State and set up mathematical equations to describe the dynamics 4. Demonstrate knowledge of choosing correct solution of mathematic 5. Solve various problems and operate the calculations with computer 6. Interpret and judge the physical meaning of result after calculations  Pass in PHYS1150 Problem solving in physics or MATH1011 Univ. University mathematics II or MATH1851 Calculus and ordinary difference by 2 and sem  Y  A+ to F  A Demonstrate thorough mastery at an advanced level of extensive knowledge to allow the course learning outcomes. Show strong analytical and critical abilities thought, and ability to apply knowledge to familiar and unfamiliar situations. Apply effect  C Demonstrate substantial command of a broad range of knowledge and ski learning outcomes. Show evidence of some analytical and critical abilities of some unfamiliar situations. Apply effect apply knowledge to most familiar and some unfamiliar situations of some analytical and critical abilities, logical thinking, bus Show limited ability to apply knowledge to solve problems. Apply lip presentational skills.  Fail Demonstrate little or no evidence of comma	Physics Quota  Dr F C C Ling, Physics (ccling@hku.hk)  Dr F C C Ling, Physics  This course provides students with experience in using mathematical tools and tect problems in physics. It is complete in itself, or may also be taken after Methods in Physics  A review on coordinate systems in three dimensions; Gradient, divergence, curl and integrals, surface integrals and volume integrals; Conservative fields and potentials; divergence theorem and the Stokes' theorem; Curvilinear coordinates; Applications of viclassical mechanics and electrodynamics; Vector spaces and matrix algebra; Properties matrices: Hermitian matrices and unitary matrices, etc; Quadratic forms; Eigenvalue diagonalization of matrices; Applications of matrix theory in physical problems; Numerical differentiation and integration.  On successful completion of this course, students should be able to:  1. Review the theory and principles of mathematical methods and compare the fearmethods.  2. Describe the connections between mathematical equations and physical problems.  3. State and set up mathematical equations to describe the dynamics and evolution of phy. 4. Demonstrate knowledge of choosing correct solution of mathematical equations.  5. Solve various problems and operate the calculations with computer.  6. Interpret and judge the physical meaning of result after calculations.  Pass in PHYS1150 Problem solving in physics or MATH1011 University mathematics University mathematics II or MATH1851 Calculus and ordinary differential equations.  Y 2nd sem  A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills require course learning outcomes. Show widence of analytical and critical abilities and logical thinking, with thought, and ability to apply knowledge to familiar and urlamiliar and urlamiliar and urlamiliar situations. Apply highly effective organizational and presentation by presentational abilities and logical thinking, with thought, and ability to apply knowledge or an skills required for attaining knowledge	

Required/recommended reading and online materials	Lecture notes provided by Course Coordinator Riley K.F., Hobson M.P. and Bence S.J.: Mathematical Methods for Physics and Engineering (Cambridge, 2006, 3rd edition) Wylie C.R., Barrett L.C.: Advanced Engineering Mathematics (McGraw Hill, 1995)
Course Website	http://www.physics.hku.hk/~phys1316/

PHYS2250 Introductory m		(o credits)		Academic Year	2014	
Offering Department	Physics			Quota		
Course Co-ordinator	Dr M K Y	ip, Physics (mankit@bohr.physics	s.hku.hk)			
Teachers Involved		Dr M K Yip (Sem 1), Physics Prof J Gao (Sem 2), Physics				
Course Objectives	who are	rse covers the foundation of meci planning to take physics, astronous and to take physics as minor. Both zed.	omy, or mathematics/phys	sics as major. It als	o serves students	
Course Contents & Topics	Conserva Angular Harmonic	Topics include: Kinematics, Newton's Laws of Motion and Their Applications, Linear Momentum and its Conservation, Variable Mass Problems, System of Particles and Centre of Mass, Torque and Rotation Angular Momentum and its Conservation, Work, Energy and its Conservation, Gravitation, Simple Harmonic Motions, Fluid Static and Pressure, Archimedes' Principle and Buoyancy, Bernoulli's Equation Surface Tension and Capillary Tube.				
Course Learning Outcomes	On succe	essful completion of this course, s	tudents should be able to:			
	<ol> <li>Apply world.</li> <li>Analys</li> </ol>	be and explain the fundamental p these principles, together with lo se and solve problems with the aid e and interpret experimental data	gical and mathematical reals of mathematics.	<b>O</b> .	ons of the physica	
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in P	PHYS1250 Fundamental physics of	or PHYS1050 Physics for	engineering student	S	
Offer in 2014 - 2015	Y 1st	t sem 2nd sem		Examination	Dec May	
Offer in 2015 - 2016	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 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.					
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills. Apply moderately effective lab skills and techniques. Mostly correct but some erroneous use of data and results to draw appropriate conclusions.				
	D	D Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills. Apply partially effective lab skills and techniques. Limited ability to use data and results to draw appropriate conclusions.				
	Fail	Demonstrate little or no evidence of outcomes. Lack of analytical and critiknowledge to solve problems. Orgaminimally effective or ineffective latappropriate conclusions.	cal abilities, logical and coheren nization and presentational skill	t thinking. Show very little s are minimally effective	e or no ability to apply or ineffective. Apply	
Course Type	Lecture w	vith laboratory component course				
Course Teaching	Activitie	es es es es es es es es es es es es es e	Details		No. of Hours	
& Learning Activities	Lectures	3			36	
	Laborato	ory			(	
	Tutorials	3				
	Reading / Self study				80	
Assessment Methods and Weighting	Methods	s	Details		Weighting in fina course grade (%	
	Assignm	nents			10	
	Examination		2-hour written exa	am	50	
	Laboratory reports					
	Laborato	ory reports			1	

reading and online materials	P.A Tipler and G. Mosca: Physics for Scientists and Engineers, (Freeman, 2008, 6th edition). D. Kleppner and Robert J. Kolenkow: An Introduction to Mechanics (McGraw Hill, 1978, International edition)
Course Website	http://www.physics.hku.hk/~phys2250/

PHYS2255 Introductory e	electricity an	d magnetism (6 credits)	Aca	demic Year	2014	
Offering Department	Physics		Quo	ota		
Course Co-ordinator	Dr J C S P	un, Physics <i>(jcspun@hku.hk)</i>				
Teachers Involved	Dr J C S P	Dr J C S Pun, Physics				
Course Objectives	for student students v	This course covers the foundation of electricity and magnetism in one semester. It serves as a core cours for students who are planning to take physics, astronomy, or mathematics/physics as major. It also serve students who intend to take physics as minor. Both conceptual ideas and mathematical treatment ir electricity and magnetsim are emphasized.				
Course Contents & Topics	conductors	Topics include: Vector notation and vector field, Electric force and electric field, Gauss' law and electric conductors, Electric potential energy and potential, Capacitance and DC circuits, Magnetic force, Magnetifield, Faraday's law of induction, Inductance, AC circuit, Maxwell's equations and electromagnetic waves.				
Course Learning Outcomes	1. Describe 2. Apply th world. 3. Analyse	On successful completion of this course, students should be able to:  1. Describe and explain the fundamental physical principles. 2. Apply these principles, together with logical and mathematical reasoning, to situations of the physical world. 3. Analyse and solve problems with the aids of mathematics. 4. Acquire and interpret experimental data to examine the physical laws.				
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in Ph	IYS1250 Fundamental physics or PHY	S1050 Physics for engine	eering students	3	
Offer in 2014 - 2015	Y 2nd	Y 2nd sem Examination May				
Offer in 2015 - 2016	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.				
	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 lab skills and techniques. Correct use of data of results to draw appropriate conclusions.				
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills. Apply moderately effective lab skills and techniques. Mostly correct but some erroneous use of data and results to draw appropriate conclusions.				
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills. Apply partially effective lab skills and techniques. Limited ability to use data and results to draw appropriate conclusions.				
	Fail	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 wit	th laboratory component course				
Course Teaching	Activities		Details		No. of Hours	
& Learning Activities	Lectures				36	
	Laborator	V			6	
	Tutorials				8	
	Reading /	Reading / Self study			80	
Assessment Methods		,				
and Weighting	Methods		Details		Veighting in final course grade (%)	
	Assignme	nts			10	
	Examinati	on	2-hour written exam		50	
	Laborator	y reports			15	
	Test				25	
Required/recommended reading and online materials	P. A. Tiple R. D. Knigl R. Resnick	r and G. Mosca: Physics for Scientists ht: Physics for Scientists and Engineers , D. Halliday, and K. Krane: Physics Vo and J. W. Jewett: Physics for Scientist	s (Pearson, 2008, 2nd ed olume 2 (John Wiley and	ition) Sons, 2002, 5	tion)	

PHYS2260 Heat and waves	(o credits	i)		Academic Year	2014	
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 covers the foundation of heat and waves in one semester. It serves as a core course fo students who are planning to take physics, astronomy, or mathematics/physics as major. It also serves students who intend to take physics as minor. Both conceptual ideas and mathematical treatment in hea and waves are emphasized.					
Course Contents & Topics	Topics include: type of waves; Sinusoidal wave including transverse velocity and phase, Wave propagation through a stretched string as an example for transverse wave, Sound wave as an example fongitudinal wave, Wave equation, Energy in wave motion, The principle of superposition, Interference waves, Standing waves and resonance, Beats, The Doppler Effect, Light wave as an electromagnet wave, Reflection, Refraction, Double slit interference, Interference from thin films, Single slit diffraction Multiple slit and grating, Polarization, Temperature and equilibrium, Ideal gas law, Molecular view of pressure, Mean free path, distributions of molecular speed and energy, Concept of heat, First law of thermodynamic, Work done on or by an ideal gas, Internal energy of an ideal gas, Molar heat capacities constant volume and constant pressure, Different thermodynamic processes including adiabatic isothermal, constant-volume, cyclical and free expansion, Reversibility of process, definition of entropy change, The second law of thermodynamic, Carnot engine, Statistical view of entropy.					
Course Learning Outcomes	On succe	ssful completion of this course, students s	hould be able to:			
	<ol> <li>Describe and explain the fundamental physical principles.</li> <li>Apply these principles, together with logical and mathematical reasoning, to situations of the world.</li> <li>Analyse and solve problems with the aids of mathematics.</li> <li>Acquire and interpret experimental data to examine the physical laws.</li> </ol>					
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in PHYS1250 Fundamental physics or PHYS1050 Physics for engineering students					
Offer in 2014 - 2015	Y 1st	sem		Examination	Dec	
Offer in 2015 - 2016	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 lab skills and techniques. Critical use of data and results to draw appropriate and insightful conclusions.					
	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.					
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills. Apply partially effective lab skills and techniques. Limited ability to use data and results to draw appropriate conclusions.				
	Fail  Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective. Apply minimally effective or ineffective lab skills and techniques. Misuse of data and results and/or unable to draw appropriate conclusions.					
Course Type	Lecture w	ith laboratory component course				
Course Teaching	Activitie	s	Details		No. of Hours	
Learning Activities	Lectures	·   •			3	
	Laborato	ry			-	
	Tutorials					
		/ Self study			8	
	ixeauiiig	/ Gell Study			8	
Assessment Methods and Weighting	Methods		Details		leighting in fina ourse grade (%	
	Assignm	ents			1	
	Examina	tion	2-hour written exam		5	
	Laborato	ry reports			1	
	Test				2	
Required/recommended reading and online materials	R. Resnic	er and G. Mosca: Physics for Scientists an k, D. Halliday, and K. Krane: Physics Volu k, D. Halliday, and K. Krane: Physics Volu	ıme 1 (John Wiley a	and Sons, 2002, 5tl	h edition)	

PHYS2265 Modern physic	s (6 credit	s)		Academic Year	2014	
Offering Department	Physics			Quota		
Course Co-ordinator	Dr F K C	how, Physics (judychow@hku.hk)				
Teachers Involved	Dr F K C	how (Sem 1 and 2), Physics				
Course Objectives	students students	This course covers the foundation of modern physics in one semester. It serves as a core course for students who are planning to take physics, astronomy, or mathematics/physics as major. It also serves students who intend to take physics as minor. Both conceptual ideas and mathematical treatment in modern physics are emphasized.				
Course Contents & Topics		Topics include: Particle Properties of Wave, Wave Properties of Particle, The Schrodinger Equation, Some Solutions to Time Independent Schrodinger Equation, The Hydrogen Atom, Spin and Many Particles				
Course Learning Outcomes	On succe	essful completion of this course, student	s should be able to:			
	<ol> <li>Apply world.</li> <li>Analys</li> </ol>	<ol> <li>Describe and explain the fundamental physical principles.</li> <li>Apply these principles, together with logical and mathematical reasoning, to situations of the physical</li> </ol>				
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in F	PHYS1250 Fundamental physics or PHY	/S1050 Physics for e	ngineering students	S	
Offer in 2014 - 2015	Y 1s	t sem 2nd sem		Examination	Dec May	
Offer in 2015 - 2016	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 the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills. Apply effective lab skills and techniques. Correct use of data of results to draw appropriate conclusions.					
	С	C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills. Apply moderately effective lab skills and techniques. Mostly correct but some erroneous use of data and results to draw appropriate conclusions.				
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills. Apply partially effective lab skills and techniques. Limited ability to use data and results to draw appropriate conclusions.				
	Fail  Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. 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 v	vith laboratory component course				
Course Teaching	Activitie	ae ae	Details		No. of Hours	
& Learning Activities	Lectures		Details		36	
	Laborate				6	
		•				
	Tutorials				8	
	Reading	y / Self study			80	
Assessment Methods and Weighting	Method	s	Details		Weighting in final course grade (%)	
	Assignm	nents			10	
	Examina	ation	2-hour written exar	m	50	
	Laboratory reports				15	
	Test				25	
Required/recommended reading and online materials	R. Harris K. Krane R. A. Ser	Lecture notes provided by Course Coordinator R. Harris: Modern Physics (Addison-Wesley, 2008, 2nd edition) K. Krane: Modern Physics (John Wiley & Sons, 2012, 3rd edition) R. A. Serway, C. J. Moses and C. A. Moyer: Modern Physics (Brooks Cole, 2004, 3rd edition) P.A Tipler and G. Mosca: Physics for Scientists and Engineers Extended Version, (Freeman, 2008, 6t				
Course Website	, '	w.physics.hku.hk/~phys2265/				

PHYS2850 Atomic and nucle	ear physics (6 credits)	Academic Year	2014	

	ang, Physics (shizhong@hku.hk)				
Dr S Z Zh					
	ang, Physics				
This course will introduce students to the fundamentals of atomic physics and rudimentary nuclear physics. It aims to provide a coherent and concise coverage of traditional atomic and nuclear physics. Important topics of current research interest will be also discussed, such as laser cooling and trapping which plays an important role in the realization of Bose-Einstein condensate in atomic vapors.					
electroma reactions.	Topics include: Atomic structure of hydrogen and hydrogen-like atom, multi-electron atom, atom in electromagnetic field, spectroscopy, laser trapping and cooling; nuclear structure, shell model and nuclear reactions. Applications of the basic principles of atomic and nuclear physics will be mentioned when appropriate.				
On succes	ssful completion of the course, stude	ents should be able to:			
magnitude 2. Explain 3. Recogn	<ol> <li>Apply general considerations of quantum physics to atomic and nuclear system; make general orders of magnitude of estimation of physical effects.</li> <li>Explain how light interacting with atom; the working principle of laser trapping and cooling.</li> <li>Recognize the general features of atomic/nuclear spectroscopy.</li> <li>Apply quantum physics to understand the basic features of simple nuclei, binding of deuteron et al.</li> </ol>				
Pass in Pl	Pass in PHYS2265 Modern physics				
N		Examin	ation		
N		I	I		
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 nighly 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.					
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. Apply moderately effective lab skills and techniques. Mostly correct but some erroneous use of data and results to draw appropriate conclusions.				
D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills. Apply partially effective lab skills and techniques. Limited ability to use data and results to draw appropriate conclusions.				
Fail	outcomes. Lack of analytical and critical a knowledge to solve problems. Organization	abilities, logical and coherent thinking. Show	w very little or no ability to apply effective or ineffective. Apply		
Lecture-ba	ased course				
Activitie	S	Details	No. of Hour		
Lectures			3		
Tutorials			1		
Reading / Self study			8		
Methods	·	Details	Weighting in fina		
Assignments			2		
Examination			5		
Test			3		
Lecture notes provided by Course Coordinator W. Demtroder, Atoms, molecules and photons (Springer, 2nd, 2011)					
			2nd, 2003)		
	Topics in electroma reactions. appropriate On successions. appropriate On successions. Apply 9 magnitude 2. Explain 3. Recogn 4. Apply 9 Pass in Plass in Pl	Topics include: Atomic structure of hydrog electromagnetic field, spectroscopy, laser traj reactions. Applications of the basic principle appropriate.  On successful completion of the course, stude 1. Apply general considerations of quantum p magnitude of estimation of physical effects. 2. Explain how light interacting with atom; the 3. Recognize the general features of atomic/n 4. Apply quantum physics to understand the b. Pass in PHYS2265 Modern physics  N  N  A+ to F  A  Demonstrate thorough mastery at an advourse learning outcomes. Show strong thought, and ability to apply knowledge effective organizational and presentation and results to draw appropriate and insight the course learning outcomes. Show evapply knowledge to familiar and some un Apply effective lab skills and techniques.  C  Demonstrate general but incomplete conlearning outcomes. Show evidence of so knowledge to most familiar situations. A moderately effective lab skills and techniques.  D  Demonstrate partial but limited command outcomes. Show evidence of some conductomes. Show ilmited ability to apply knowledge presentational skills. Apply partially effect appropriate conclusions.  Fail  Demonstrate little or no evidence of conductomes. Lack of analytical and critical knowledge to solve problems. Organiza minimally effective or ineffective lab skills appropriate conclusions.  Lecture-based course  Activities  Lectures  Tutorials  Reading / Self study  Methods  Assignments  Examination  Test  Lecture notes provided by Course Coordinators. Krane, Introductory nuclear physics (John M. Kr	Topics include: Atomic structure of hydrogen and hydrogen-like atom, multi- electromagnetic field, spectroscopy, laser trapping and cooling; nuclear structure reactions. Applications of the basic principles of atomic and nuclear physics appropriate.  On successful completion of the course, students should be able to:  1. Apply general considerations of quantum physics to atomic and nuclear system angnitude of estimation of physical effects.  2. Explain how light interacting with atom, the working principle of laser trapping.  3. Recognize the general features of atomic/nuclear spectroscopy.  4. Apply quantum physics to understand the basic features of simple nuclei, bind pass in PHYS2265 Modern physics.  N		

PHYS3150 Theoretical physics (6 credits)		Academic Year	2014	
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 conceptual skills and key analytical tools for solving real problems in all major areas of physics.			

Course Contents & Topics	This course will introduce and address the following topics: Application of complex variables including the Cauchy's integral formula and calculus of residues, Partial differential equations (the general wave equation, the Schrodinger equation, the Poisson equation, and the diffusion equation), Properties of special functions widely used in Physics (Gamma functions, Beta functions, Bessel functions, spherical harmonics etc.), Fourier Series, and Fourier Transform.					
Course Learning Outcomes	1. Analyse 2. Calcula 3. Analyse 4. Apply th	On successful completion of this course, students should be able to:  1. Analyse and examine the analytical properties of complex functions.  2. Calculate various definite integrals using the method of residues.  3. Analyse and solve the first and second order ordinary equations, and typical partial differential equations.  4. Apply the special functions in handling various physical problems.  5. Use the Fourier Series and Fourier transform in describing, respectively, any periodic function and wave.				
Pre-requisites (and Co-requisites and Impermissible combination)		PHYS2250 Introductory mechanics of Modern physics) and (PHYS2150 M				
Offer in 2014 - 2015	Y 1st	Y 1st sem Examination Dec				
Offer in 2015 - 2016	Υ	Υ				
Course Grade	A+ to F					
Grade Descriptors	Α	Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.				
	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	Fail  Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.				
Course Type	Lecture-ba	ased course				
Course Teaching	Activities	S	Details		No. of Hours	
& Learning Activities	Lectures				36	
	Tutorials				12	
	Reading	/ Self study			80	
Assessment Methods and Weighting	Methods		Details		Weighting in final course grade (%)	
	Assignme	ents			20	
	Examination		3-hour written exar	n	70	
	Test				10	
Required/recommended reading and online materials		otes provided by Course Coordinator and H. Weber: Mathematical Methods	s for Physicists (Acade	emic Press, 2005)		

PHYS3350 Classical mech	anics (6 credits)	Academic Year	2014		
Offering Department	Physics	Quota			
Course Co-ordinator	Dr S Z Zhang, Physics (shizhong@hku.hk)				
Teachers Involved	Dr S Z Zhang, Physics				
Course Objectives	Build on the foundation course PHYS2250, this course discusses of undergraduate level with vigorous mathematical treatment. It serves students as well as an elective core for those who are interested to g mechanics and to apply related techniques in their own majors. This who plan to pursue postgraduate studies in physics or related dismathematical treatment are emphasized.	s as a core course ain a deep understa s is also an essentia	for physics majo Inding of classica I course for those		
Course Contents & Topics	Topics include: Kinematics; Application of Newton's laws (statics, dynamics); Conservation laws, Many particle System; Rotational motion and Angular Momentum. Specific topics will include (coupled) harmonic oscillators; central force problems, collisions and problems associated with constraint motions, chaos.				
Course Learning Outcomes	On successful completion of this course, students should be able to:  1. Apply Newton's laws to static as well as dynamic situations.  2. Apply conservation laws to mechanical problems and in particular,  3. Understand the general features of a many-particle system, and ap force and toque equilibrium to simplify and analyze problems.  4. Understand the physical principles at work in experiments and	pply concepts such a	s center of mass		

	appropria	appropriate concepts and laws.				
Pre-requisites (and Co-requisites and Impermissible combination)		Pass in PHYS2250 Introductory mechanics				
Offer in 2014 - 2015	Y 1s	Y 1st sem			Dec	
Offer in 2015 - 2016	Υ					
Course Grade	A+ to F	A+ to F				
Grade Descriptors	A	course learning outcomes. Show stron thought, and ability to apply knowledge	dvanced level of extensive knowledge as g analytical and critical abilities and logic to a wide range of complex, familiar an nal skills. Apply highly effective lab skills ghtful conclusions.	cal thinking, wit nd unfamiliar si	th evidence of original ituations. Apply highly	
	В	the course learning outcomes. Show apply knowledge to familiar and some	a broad range of knowledge and skills re evidence of analytical and critical abilities unfamiliar situations. Apply effective orga s. Correct use of data of results to draw a	s and logical t anizational and	thinking, and ability to d presentational skills.	
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills. Apply moderately effective lab skills and techniques. Mostly correct but some erroneous use of data and results to draw appropriate conclusions.				
	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	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 v	vith laboratory component course				
Course Teaching	Activitie	9S	Details		No. of Hours	
& Learning Activities	Lectures	<u> </u>			36	
	Laborato	ory			6	
	Tutorials	•			8	
	Assessn	Assessment			80	
Assessment Methods and Weighting	Method	s	Details		Weighting in final course grade (%)	
	Assignm	nents			10	
	Examina	ation	2-hour written exam		60	
	Laborato	pry reports			10	
	Test				20	
Required/recommended reading and online materials	David Mo	otes provided by Course Coordina orin: Introduction to Classical Mechanier and Robert J. Kolenkow: An Int	anics, (Cambridge, 2007).	dge, 2010).		

Offering Department Course Co-ordinator Teachers Involved Course Objectives	Physics  Dr W Yao, Physics (wangyao@hku.hk)  Dr W Yao, Physics  Build on the foundation course PHYS2265, this course disc	Quota		
eachers Involved	Dr W Yao, Physics			
	<u> </u>			
ourse Objectives	Build on the foundation course PHVS2265, this course disc			
	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 major 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	Time-dependent Schrodinger equation; statistical interpretation of wave function; probability density; probability current and continuity equation; momentum; physical observable and expectation value; Heisenberg uncertainty principle; time-independent Schrodinger equation; Hamiltonian and stationary states; particle in a square well; transmission and reflection at a barrier; harmonic oscillator problem using ladder operators; free particle and wavepacket; delta function potential; Dirac notations; state vectors. Hilbert space; Hermitian operators; eigenstates and eigenvalues; generalized statistical interpretation; generalized uncertainty principle; angular momentum; hydrogen atom; atomic orbits; spin; non-degenerate perturbation theory.			
Course Learning Outcomes	On successful completion of this course, students should be able to:  1. Describe the statistical interpretation of quantum mechanical systems, and calculate expectat and uncertainty of physical observables.  2. Formulate energy eigenvalue problems, and solve them in examples where potentials ha analytical forms.			

	known e 4. Judge correctio	3. Formulate time evolution of the wavefunction and the expectation value of physical observables wit known energy eigenfunctions.  4. Judge the applicability of time-independent perturbation theory and formulate leading order energ corrections in certain perturbations applied to the physical system.  5. Acquire and interpret experimental data to examine the physical laws.				
Pre-requisites (and Co-requisites and Impermissible combination)		PHYS2265 Modern physics				
Offer in 2014 - 2015	Y 1s	t sem		Examination	Dec	
Offer in 2015 - 2016	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 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.			th evidence of original ituations. Apply highly	
	В	Demonstrate substantial comman- the course learning outcomes. St apply knowledge to familiar and s Apply effective lab skills and techn	now evidence of analytical and crione unfamiliar situations. Apply e	itical abilities and logical teffective organizational and	thinking, and ability to d presentational skills.	
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills. Apply moderately effective lab skills and techniques. Mostly correct but some erroneous use of data and results to draw appropriate conclusions.				
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills. Apply partially effective lab skills and techniques. Limited ability to use data and results to draw appropriate conclusions.				
	Fail	Demonstrate little or no evidence outcomes. Lack of analytical and knowledge to solve problems. Or minimally effective or ineffective appropriate conclusions.	critical abilities, logical and cohere ganization and presentational ski	nt thinking. Show very little ills are minimally effective	e or no ability to apply or ineffective. Apply	
Course Type	Lecture	with laboratory component cours	se			
Course Teaching	Activiti	es	Details		No. of Hours	
& Learning Activities	Lecture	S			36	
	Laborat	ory			6	
	Tutorial	3			8	
	Reading	g / Self study			80	
Assessment Methods and Weighting	Method	s	Details		Weighting in final course grade (%)	
	Assignn	nents			10	
	Examin	ation	3-hour written ex	am	60	
	Laborat	ory reports			10	
	Test				20	
Required/recommended reading		Lecture notes provided by Course Coordinator D. J. Griffiths: Introduction to Quantum Mechanics (Pearson Prentice Hall, 2004, 2nd ed.)				
and online materials						

PHYS3450 Electromagnetism (6 credits)  Academic Year 2014					
Offering Department	Physics	Quota			
Course Co-ordinator	Prof X D Cui, Physics (xdcui@hku.hk)				
Teachers Involved	Prof X D Cui, Physics				
Course Objectives	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	Topics include electric fields and potential, methods in electrostatics, conductors and dielectrics, magnetostatics and electromagnetic induction, magnetic properties of materials and Maxwell's equations.				
Course Learning Outcomes	On successful completion of this course, students should be able to:  1. Identify the fundamental physics in electrostatics and magnetism.  2. Apply mathematical tools to describe electrostatics and magnetism.  3. Use the Maxwell's equations to explain various electrostatic and magnetic phenomena.  4. Differentiate between electrostatics in vacuum and in dielectric materials.				
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	6. Apply	<ul><li>5. Differentiate between magnetism in vacuum and in magnetic materials.</li><li>6. Apply essential skills of making measurements with appropriate instruments in physics. experimental three experimental data and compare with the prediction of underlying physical principle.</li></ul>				
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in F	Pass in PHYS2255 Introductory electricity and magnetism				
Offer in 2014 - 2015	Y 2n	d sem		Examination	May	
Offer in 2015 - 2016	Υ					
Course Grade	A+ to F	A+ to F				
Grade Descriptors	A	course learning outcomes thought, and ability to app effective organizational an	stery at an advanced level of extensive land strong analytical and critical ability knowledge to a wide range of comple d presentational skills. Apply highly effect oriate and insightful conclusions.	ies and logical thinking, wx, familiar and unfamiliar	ith evidence of original situations. Apply highly	
	В	the course learning outco apply knowledge to familia	command of a broad range of knowledge mes. Show evidence of analytical and c ar and some unfamiliar situations. Apply nd techniques. Correct use of data of resu	ritical abilities and logical effective organizational ar	thinking, and ability to nd presentational skills.	
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills. Apply moderately effective lab skills and techniques. Mostly correct but some erroneous use of data and results to draw appropriate conclusions.				
	D  Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills. Apply partially effective lab skills and techniques. Limited ability to use data and results to draw appropriate conclusions.					
	Fail	outcomes. Lack of analytic knowledge to solve problem.	evidence of command of knowledge and cal and critical abilities, logical and coher ems. Organization and presentational sl ffective lab skills and techniques. Misu	ent thinking. Show very litt	tle or no ability to apply e or ineffective. Apply	
Course Type	Lecture v	vith laboratory componer	nt course			
Course Teaching	Activitie	Activities Details			No. of Hours	
& Learning Activities	Lectures	3			36	
	Laborate	ory			(	
	Tutorials	3				
	Reading	Reading / Self study			80	
Assessment Methods and Weighting	Method	s	Details		Weighting in fina course grade (%	
	Assignm	nents			10	
	Examina	ation	3-hour written e.	xam	60	
	Laborate	ory reports			10	
	Test				20	
Required/recommended reading and online materials		notes provided by Course fiths: Introduction to Elec	e Coordinator trodynamics, 3rd ed., (Prentice-H	lall, 1999).		

PHYS3550 Statistical mecl	hanics & thermodynamics (6 credits)	Academic Year	2014			
Offering Department	Physics	Quota				
Course Co-ordinator	Prof S Fung, Physics (sfung@hku.hk)					
Teachers Involved	Prof S Fung, Physics					
Course Objectives	Build on the foundation course PHYS2260, this course disc thermodynamics in the advanced undergraduate level with vigorous n core course for physics major students as well as an elective core to deep understanding of statistical mechanics and thermodynamics an own majors. This is also an essential course for those who plan to pu or related disciplines. Both conceptual ideas and mathematical treatm	nathematical treatment those who are into do to apply related to apply related to a postgraduate	ent. It serves as a erested to gain a echniques in their studies in physics			
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:  1. Describe and explain the fundamental physical principles.  2. Apply these principles, together with logical and mathematical reworld.  3. Analyse and solve problems with the aids of mathematics.  4. Acquire and interpret experimental data to examine the physical law	O.	ns of the physical			

Pre-requisites (and Co-requisites and Impermissible combination)	Pass in PHYS2260 Heat and waves				
Offer in 2014 - 2015	Y 2r	nd sem		Examination	May
Offer in 2015 - 2016	Υ				
Course Grade	A+ to F				
Grade Descriptors	A	Demonstrate thorough mastery at an course learning outcomes. Show stro thought, and ability to apply knowledg effective organizational and presentat and results to draw appropriate and in	ng analytical and critical abilities a ge to a wide range of complex, far ional skills. Apply highly effective la	nd logical thinking, wi niliar and unfamiliar s	ith evidence of original situations. Apply highly
	В	Demonstrate substantial command of the course learning outcomes. Show apply knowledge to familiar and some Apply effective lab skills and technique	evidence of analytical and critical unfamiliar situations. Apply effect	abilities and logical tive organizational an	thinking, and ability to d presentational skills.
	С	Demonstrate general but incomplete learning outcomes. Show evidence o knowledge to most familiar situation: moderately effective lab skills and tea appropriate conclusions.	f some analytical and critical abiliti s. Apply moderately effective orga	ies and logical thinkir anizational and prese	ng, and ability to apply entational 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. 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 outcomes. Lack of analytical and critic knowledge to solve problems. Organ minimally effective or ineffective lab appropriate conclusions.	cal abilities, logical and coherent the sization and presentational skills a	inking. Show very litt are minimally effective	le or no ability to apply e or ineffective. Apply
Course Type	Lecture v	with laboratory component course			
Course Teaching	Activities Details		Details		No. of Hours
& Learning Activities	Lecture	S			36
	Laboratory				6
	Tutorials				8
	Reading / Self study				80
Assessment Methods and Weighting	Method	s	Details		Weighting in final course grade (%)
	Assignn	nents			10
	Examina	ation	2-hour written exam		60
	Laboratory reports				10
	Test	•			20
Required/recommended reading and online materials	F. Mandl C. Kittel:	Lecture notes provided by Course Coordinator F. Mandl: Statistical Physics, 2nd edition (John Wiley, 1988). C. Kittel: Elementary Statistical Physics (Robert E. Krieger, 1988). F.W. Sears & G.L. Salinger: Thermodynamics, Kinetic Theory and Statistical Thermodynamics (Addison			

PHYS3551 Introductory so	Academic Year	2014					
Offering Department	Physics	Quota					
Course Co-ordinator	Prof J Gao, Physics (jugao@hku.hk)	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 mor advanced courses and projects in solid state physics.						
Course Contents & Topics	Crystal structures and symmetry. The formation of crystals. The reciprocal lattice and X-ray diffraction crystals. Lattice vibrations and thermal properties. Free-electron theory of metals. Energy bands; metal semiconductors, and insulators. If time permits, special topics such as superconductor will be bried mentioned.						
Course Learning Outcomes	Demonstrate knowledge for crystal structures and a Describe the behavior of solid matter and explain the Apply physical principles and mathematical equations.	On successful completion of this course, students should be able to:  1. Demonstrate knowledge for crystal structures and characterization.  2. Describe the behavior of solid matter and explain the underlying physical concepts.  3. Apply physical principles and mathematical equations to discuss the physical properties of materials.  4. Apply essential skills of making measurements with appropriate instruments in physics experiments.					
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in PHYS2260 Heat and waves and PHYS2265 I	Modern physics					

Offer in 2015 - 2016	Y					
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 abilities and logical thinking, with evidenc 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. Critical and results to draw appropriate and insightful conclusions.				
	В	Demonstrate substantial command of a brothe course learning outcomes. Show evide apply knowledge to familiar and some unfa Apply effective lab skills and techniques. Co	ence of analytical and critical abilities a imiliar situations. Apply effective organi	and logical thinking, and ability to izational and presentational skills.		
	С	Demonstrate general but incomplete communication outcomes. Show evidence of som knowledge to most familiar situations. Ap moderately effective lab skills and techniquappropriate conclusions.	e analytical and critical abilities and looly moderately effective organizational	gical thinking, and ability to apply and presentational skills. Apply		
	D	outcomes. Show evidence of some coher Show limited ability to apply knowledge t	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			
	Fail	Demonstrate little or no evidence of commoutcomes. Lack of analytical and critical ab knowledge to solve problems. Organizatio minimally effective or ineffective lab skills appropriate conclusions.	ilities, logical and coherent thinking. Sh n and presentational skills are minima	ow very little or no ability to apply ally effective or ineffective. Apply		
Course Type	Lecture w	ith laboratory component course				
Course Teaching	Activities	S	Details	No. of Hours		
& Learning Activities	Lectures			36		
	Laborato	гу		6		
	Tutorials			8		
	Reading / Self study			80		
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)		
	Assignme	ents		15		
	Examinat	tion	2-hour written exam	60		
	Laboratory reports			10		
	Test			15		
Required/recommended reading and online materials	C. Kittel: I	ntroduction to Solid State Physics (Jo	hn Wiley, 1986, 6th ed.)			

PHYS3650 Observational a	astronomy	(6 credits)		Academic Year	2014		
Offering Department	Physics			Quota			
Course Co-ordinator	Dr J J L Lir	Dr J J L Lim, Physics (jjlim@hku.hk)					
Teachers Involved	Dr J J L Lir	n, Physics					
Course Objectives	An introduction to tools of contemporary observation astronomy, with a focus on those used at optical wavelengths, as well as an introduction to observational aspects of stars and galaxies at optical 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 observa system; as	Topics include: properties and configurations of optical telescopes; properties of light, atmospheric effect on observations; properties of astronomical detectors (PMT, CCD); astronomical imaging and magnitude system; astronomical spectroscopy; observations of stars and galaxies including blackbody radiation, colo magnitude system, emission and absorption spectrum, and astronomical redshifts.					
Course Learning Outcomes	Describe optical way 2. Describe 3. Explain of stars, ga	sful completion of this course, see and explain the workings of selengths.  The the effects of the properties of the methods of astronomical laxies, and the universe.  The arms of the selection	astronomical telescopes ar light and Earth's atmosphe cal photometry and spectros	re on astronomical oscopy are applied to	observations.		
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in Ph physics)	YS1650 Nature of the universe	e and (PHYS2250 Introduct	ory mechanics or Pl	HYS2265 Moder		
Offer in 2014 - 2015	Y 1st s	sem		Examination	Dec		
Offer in 2015 - 2016	Υ			·	·		
Course Grade	A+ to F						
Grade Descriptors	A	Demonstrate thorough mastery at an course learning outcomes. Show str					

		thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply higher effective organizational and presentational skills. Apply highly effective lab skills and techniques. Critical use of data and results to draw appropriate and insightful conclusions.				
	В	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 or esults to draw appropriate conclusions.				
	С					
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills. Apply partially effective lab skills and techniques. Limited ability to use data and results to draw appropriate conclusions.				
	Fail	Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective. Apply minimally effective or ineffective lab skills and techniques. Misuse of data and results and/or unable to draw appropriate conclusions.				
Course Type	Lecture v	vith laboratory component course				
Course Teaching	Activities		Details	No. of Hours		
& Learning Activities	Lectures	3		36		
	Laboratory			4		
	Tutorials			8		
	Reading / Self study			80		
Assessment Methods and Weighting	Method	s	Details	Weighting in final course grade (%)		
	Assignm	nents		30		
	Examina	ation	2-hour written exam	50		
	Laborate	ory reports		10		
	Test			10		
Required/recommended reading and online materials	Lecture notes provided by Course Coordinator Frederick R. Chromey: To Measure the Sky B. W. Carroll & D. A. Ostlie: An Introduction to Modern Astrophysics (Addison-Wesley Publishing Company, 2007, 2nd edition)					

PHYS3651 The physical ur	niverse (6 o	credits)			Academic Year	2014
Offering Department	Physics				Quota	
Course Co-ordinator	Dr S C Y	Dr S C Y Ng, Physics (ncy@bohr.physics.hku.hk)				
Teachers Involved	Dr S C Y	Ng, Physics				
Course Objectives	To introdu	uce basic physic	al principles of astronom	y and build a found	ation in modern ast	rophysics.
Course Contents & Topics			and celestial coordinat			telescopes, basi
Course Learning Outcomes	1. Calcula 2. Describ 3. Derive	Calculate the transformation between different celestial coordinate systems.  Describe the formation of spectral lines and basic structures of telescopes.  Derive the orbits in two body problem from first principle.  Recall the radiative transfer equation.				
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in P physics)	Pass in PHYS1650 Nature of the universe and (PHYS2250 Introductory mechanics or PHYS2265 Mod physics)				
Offer in 2014 - 2015	Y 1st	t sem			Examination	Dec
Offer in 2015 - 2016	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	outcomes. Lack of analytical and	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-b	Lecture-based course					
Course Teaching	Activitie	es	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 (%)			
	Assignments			10			
	Examination		2-hour written exam	60			
	Presentation			10			
	Test			20			
Required/recommended reading and online materials	Lecture notes provided by Course Coordinator Bradley W. Carroll and Dale A. Ostlie, An Introduction to Modern Astrophysics (Pearson, 2007) George B. Rybicki and Alan P. Lightman, Radiative Processes in Astrophysics (Wiley-Interscience, 1985) Frank H. Shu, The Physical Universe: An Introduction to Astronomy, (University Science Books, 1982) A. C. Phillips, The Physics of Stars (John Wiley & Sons, 1999) Laurence G. Taff, Celestial Mechanics (John Wiley & Sons, 1985)						
Course Website	http://www	w.physics.hku.hk/~phys3651/					

PHYS3652 Principles of as	stronomy (	6 credits)		Academic Year	2014		
Offering Department	Physics		(	Quota			
Course Co-ordinator	Dr J J L L	.im, Physics <i>(jjlim@hku.hk)</i>					
Teachers Involved	Dr J J L L	im, Physics					
Course Objectives		uce or review a number of basic physic omy to gain knowledge of the Universe.		ain how these prir	nciples are applied		
Course Contents & Topics		clude: special relativity, Doppler effect; es and interferometers; binary stars ar					
Course Learning Outcomes	1. Describ 2. Associa 3. Apply	On successful completion of this course, students should be able to:  1. Describe and explain the physical principles discussed. 2. Associate the correct physical principles with the observed properties of certain astronomical objects. 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 combination)	Pass in P physics)	Pass in PHYS1650 Nature of the universe and (PHYS2250 Introductory mechanics or PHYS2265 Mode physics)					
Offer in 2014 - 2015	Y 2nd	d sem		Examination	May		
Offer in 2015 - 2016	Υ						
Course Grade	A+ to F						
Grade Descriptors	A Demonstrate thorough mastery of the knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities, clear logical thinking, evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar, and unfamiliar situations using highly effective organizational and presentation 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. 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, logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.						
	D Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.						
	Fail  Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.						
Course Type	Lecture-b	ased course					
Course Teaching	Activitie	es	Details		No. of Hours		
& Learning Activities	Lectures				36		
	Tutorials				12		
	Danding	/ Self study			80		

		1	
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)
	Assignments		35
	Examination	2-hour written exam	50
	Test		15
Required/recommended reading and online materials	Lecture notes provided by Course Coordinator B. W. Carroll & D. A. Ostlie: An Ir Publishing Company, 2007, 2nd edition)		hysics (Addison-Wesley

PHYS3750 Laser and spe	ctroscopy	(o creaits)		Academic Year	2014		
Offering Department	Physics			Quota			
Course Co-ordinator	Prof S J >	rof S J Xu, Physics (sjxu@hku.hk)					
Teachers Involved	Prof S J >	Ku, Physics					
Course Objectives	The cours	se aims at providing a broad introdu	iction to major types of la	sers and modern la	ser spectroscopy		
Course Contents & Topics	spectrosc	on to lasers and modern laser copic techniques. Lasers as sp nts. Photoluminescence. Raman sp	ectroscopic light source				
Course Learning Outcomes	1. Restate 2. Descrit 3. Demor 4. Identify 5. Employ samples. 6. Interpre	On successful completion of this course, students should be able to:  . Restate the properties of fundamental optical processes.  2. Describe fundamental operation principle of modern lasers.  3. Demonstrate solid knowledge of modern laser spectroscopic techniques.  4. Identify main components of modern optical spectroscopic instruments.  5. Employ laser photoluminescence setup to measure low-temperature photoluminescence spectra of solid amples.  6. Interpret the experimental data and compare with the prediction of underlying physical principle.					
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in P	HYS3551 Introductory solid state p	hysics, or already enrolle	d in this course.			
Offer in 2014 - 2015	Y 1st	sem		Examination	Dec		
Offer in 2015 - 2016	Y						
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.					
	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 lab skills and techniques. Correct use of data of results to draw appropriate conclusions.					
	С	C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and 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	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	Fail  Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective. Apply minimally effective or ineffective lab skills and techniques. Misuse of data and results and/or unable to draw appropriate conclusions.					
Course Type	Lecture w	vith laboratory component course					
Course Teaching	Activitie	es	Details		No. of Hours		
& Learning Activities	Lectures				36		
	Laborato				1(		
	Tutorials	•					
					80		
		Reading / Self study			0		
	rteading	/ Och study	-				
	Methods		Details				
		5	Details		Veighting in fina course grade (%)		
Assessment Methods and Weighting	Methods	s ents	Details  2-hour written example of the second secon	(	course grade (%		

reading and online materials

J. Garcia Sole, L. E. Bausa, and D. Jaque: An Introduction to the Optical Spectroscopy of Inorganic Solids (John Wiley & Sons, 2005)

DUIVOOZEA Diveries of many		/O			A   ! - V	0044	
PHYS3751 Physics of nand		(6 creaits)			Academic Year	2014	
Offering Department	Physics				Quota		
Course Co-ordinator	TBC, Phys	sics ()					
Teachers Involved	TBC, Phys	FBC, Physics					
Course Objectives	fundament	al concepts and p	let senior undergradu physical properties of na ires and zero-dimensio	anomaterials includ			
Course Contents & Topics	nanomater electron ga of quantu	Introduction to nanomaterials and quantum size effect. Dimensionalities and density of states of various nanomaterials. Optical and transport properties of quantum wells, superlattices and two-dimensional electron gas. Physical properties of carbon nanotubes and semiconductor nanowires. Physical properties of quantum dots and nanocrystals. Fundamental principles of scanning tunneling microscopy and advanced thin-film growth techniques such as molecular beam epitaxy and metalorganic chemical vapor deposition.					
Course Learning Outcomes	On succes	sful completion of	this course, students s	hould be able to:			
	<ol> <li>Identify dimension</li> <li>Recogn techniques</li> <li>Describe</li> </ol>	1. Recall basic concepts and knowledge of dimensionality, density of states, quantum size effect. 2. Identify and compare optical and transport properties of quantum wells, superlattices and two dimensional electron gas. 3. Recognise the fundamental principles of scanning tunneling microscopy and advanced thin-film growth techniques such as molecular beam epitaxy and metalorganic chemical vapor deposition. 4. Describe the basic physics of carbon nanotubes and semiconductor nanowires. 5. Explain physical properties of zero-dimensional quantum dots and nanocrystals.					
Pre-requisites (and Co-requisites and Impermissible combination)		Pass in PHYS3351 Quantum mechanics, and Pass in PHYS3551 Introductory solid state physics, or already enrolled in this course.					
Offer in 2014 - 2015	N				Examination		
Offer in 2015 - 2016	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 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.						
	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. Apply moderately effective observation skills and techniques. Mostly correct but some erroneous use of data and results to draw appropriate conclusions.					
	D						
	Fail	outcomes. Lack of a	or no evidence of command analytical and critical abilities problems. Organization and	, logical and coherent th	inking. Show very little or	no ability to apply	
Course Type	Lecture-ba	sed course					
Course Teaching & Learning Activities	Activities	<b>S</b>	Details			No. of Hours	
Assessment Methods and Weighting	Methods		Details			ighting in final urse grade (%)	
Required/recommended reading and online materials	TBC						

PHYS3850 Waves and opt	Academic Year	2014				
Offering Department	Physics Quota					
Course Co-ordinator	Dr J K C Leung, Physics (jkcleung@hku.hk)					
Teachers Involved	Dr J K C Leung, Physics	Dr J K C Leung, Physics				
Course Objectives	To give a coherent introduction to the development of modern physical the wave properties of light and optic application.	To give a coherent introduction to the development of modern physical optics, with particular attention to the wave properties of light and optic application.				
Course Contents & Topics	Mathematical theory of wave motion and the electromagnetic theory of light; the propagation of light and the laws of reflection and refraction; superposition and Fourier analysis of waves; theories, experimental observation and applications of polarization, interference and diffraction, thick lenses.					
Course Learning Outcomes	On successful completion of this course, students should be able to:					

	interferer 2. Apply devices.	Explain and calculate the properties of waves including propagation, reflection, refraction, polarization interference and diffraction by using the theory of waves.     Apply the theory of optics to calculate the geometrical parameters of thick lenses and design optic devices.     Apply essential theories to design anti-reflection and reflection-enhancement films.				
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in F	PHYS2255 Introductory electric	ity and magnetism and PH	YS2260 Heat and w	aves	
Offer in 2014 - 2015	Y 2n	d sem		Examination	May	
Offer in 2015 - 2016	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.				
	В	Demonstrate substantial commar outcomes. Show evidence of ana to familiar and some unfamiliar sil skills and techniques. Correct use	ytical and critical abilities, reason uations. Apply effective organizat	ed logical thinking, and al ional and presentational	bility to apply knowledge	
	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. Apply moderately effective observation skills and techniques. Mostly correct but some erroneous use of data and results to draw appropriate conclusions.				
	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	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 v	vith laboratory component cour	rse			
Course Teaching	Activitie		Details		No. of Hours	
& Learning Activities	Lectures		Johano		36	
	Laborate	Laboratory			6	
		Tutorials			8	
	Reading	Reading / Self study			80	
Assessment Methods and Weighting	Method	s	Details		Weighting in final course grade (%)	
	Assignm	nents			10	
	Examina	ation	2-hour written e	xam	60	
	Laborate	ory reports			10	
	Test				20	
Required/recommended reading and online materials	Eugene I	notes provided by Course Coor Hecht: Optics, (Addison-Wesle her: Modern Optics, (John Wile	y, 2001, 4th ed.).	<u> </u>		

PHYS3851 Atomic and nuc	clear physics (6 credits)	Academic Year	2014			
Offering Department	Physics	Quota				
Course Co-ordinator	Dr S Z Zhang, Physics (shizhong@hku.hk)					
Teachers Involved	Dr S Z Zhang, Physics					
Course Objectives	This course will introduce students to the fundamentals of atomic physics. It aims to provide a coherent and concise coverage of tra Emphasis will be put on practical application of quantum mechanics atomic and nuclear physics. If time permits, other topics of current in laser cooling and trapping.	ditional atomic and as well as concept	nuclear physics. ual framework of			
Course Contents & Topics	Topics include: Atomic structure of hydrogen and hydrogen-like atom, multi-electron atom, atom in electromagnetic field, spectroscopy; nuclear structure, shell model and nuclear reactions. Applications of the basic principles of atomic and nuclear physics will be mentioned when appropriate.					
Course Learning Outcomes	On successful completion of the course, students should be able to:  1. Apply general considerations of quantum mechanics to atomic orders of magnitude of estimation of physical effects.  2. Explain how light interacting with atom.  3. Recognize the general features of multi-electron atomic system.  4. Apply quantum mechanics to understand the basic features of simple statements.	ŕ				

Pre-requisites (and Co-requisites and Impermissible combination)		HYS3351 Quantum mechanic	S				
Offer in 2014 - 2015	Y 2nd	Y 2nd sem Examination May					
Offer in 2015 - 2016	Υ						
Course Grade	A+ to F						
Grade Descriptors	A	course learning outcomes. Show thought, and ability to apply know	t an advanced level of extensive k strong analytical and critical abiliti yledge to a wide range of complex intational skills. Apply highly effect d insightful conclusions.	es and logical thinking, was, familiar and unfamiliar	rith evidence of original situations. Apply highly		
	В	the course learning outcomes. S apply knowledge to familiar and	d of a broad range of knowledge how evidence of analytical and cr some unfamiliar situations. Apply on iques. Correct use of data of resu	itical abilities and logical effective organizational ar	thinking, and ability to nd presentational skills.		
	С	learning outcomes. Show eviden knowledge to most familiar situa	lete command of knowledge and ce of some analytical and critical tions. Apply moderately effective d techniques. Mostly correct but s	abilities and logical thinking organizational and presentational and presentational and presentations.	ng, and ability to apply entational 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. Lack of analytical and knowledge to solve problems. O	e of command of knowledge and critical abilities, logical and cohere rganization and presentational sk lab skills and techniques. Misus	ent thinking. Show very litt ills are minimally effective	tle or no ability to apply re or ineffective. Apply		
Course Type	Lecture-b	ased course					
Course Teaching	Activitie	S	Details		No. of Hours		
& Learning Activities	Lectures		2000.00		36		
	Tutorials				12		
	Reading	Reading / Self study			80		
Assessment Methods and Weighting	Methods	3	Details		Weighting in final course grade (%)		
	Assignm	ents			20		
	Examination		2-hour written ex	kam	60		
	Test				20		
Required/recommended reading and online materials	W. Demtr	Lecture notes from the Course Coordinator W. Demtroder: Atoms, molecules and photons (Springer, 2011, 2nd ed.) K. Krane: Introductory nuclear physics (John Wiley & Sons. 1988)					
		K. Krane: Introductory nuclear physics (John Wiley & Sons, 1988)					

PHYS3999 Directed studies	s in physics (6 credits)	Academic Year	2014			
Offering Department	Physics Quota -					
Course Co-ordinator	Dr J K C Leung, Physics (jkcleung@hku.hk)	<u>'</u>	'			
Teachers Involved	Various teachers in the department, Physics					
Course Objectives	This capstone course is offered to students majoring in physics, math/physics or astronomy. It should be taken normally in their final year of study. It provides students with the opportunity to study a small problem by themselves, either theoretical, experimental or numerical, under the supervision of an academic staff using the subject materials the student has learn in all years of his/her major study. The available projects range from small scale research, critical literature review and comment, and to development of university-level physics or astronomy teaching tools.					
Course Contents & Topics	Students interested in taking this course should contact their prospective supervisors in May to determine the contents and the nature of their projects in the coming academic year. They must get the approva from both the prospective supervisor and the course coordinator to take this course.  Students will receive training in research literature reading and reviewing, under the supervision of a staf member. For theoretical project, students may need to fill in mathematical gaps of some sophisticated derivations and the critically analyze the research methods used in the field. For numerical projects, students need to use computers to reproduce existing numerical or simulation results. For experimenta projects, students have to understand the design of the experiment, carrying it out and analyze the sources of errors.					
Course Learning Outcomes	On successful completion of this course, students should be a 1. Review the knowledge of a physics or astronomy problem and research journals based on what they have learnt in their 2. Criticize existing approaches for solving the selected physic 3. Describe and explain connections between the physical prir 4. (For theoretical or computational projects) identify the k	in depth through literatur majors. s or astronomy problem. nciples and the study probl	em.			

		solutions. 5. (For experimental projects) propose and execute physics experiments or astronomical observation analyze results and sources of errors of the experiment or observation in comparison with predictions.					
Pre-requisites (and Co-requisites and Impermissible combination)	Physics M	Pass in at least 24 credits of advanced level (3XXX level or above) compulsory/core 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.					
Offer in 2014 - 2015	Y 2nd	d sem	Examination	No Exam			
Offer in 2015 - 2016	Υ			<u>'</u>			
Course Grade	A+ to F						
Grade Descriptors	A	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	B Demonstrate substantial grasp of the subject. Show evidence of logical and independent thinking. Critical use of relevant information from sources, showing ability to make meaningful comparisons between different secondary interpretations and to quote/reference aptly. Correct use of data of results to draw appropriate conclusions. Apply effective organizational and presentational skills.					
	С	C Demonstrate general but incomplete grasp of the subject. Show some evidence of logical and independent thinking. Use of relevant information from sources, showing ability to make comparisons between different interpretations and to quote/reference aptly. Mostly correct but some erroneous use of data and results to draw appropriate conclusions. Apply moderately effective organizational and presentational skills.					
	D	D Demonstrate partial but limited grasp, with retention of some relevant information, of the subject. Show limited evidence of logical and independent thinking. Demonstrate use and reference of several sources, but mainly through summary rather than analysis and comparison. Limited ability to use data and results to draw appropriate conclusions. Apply limited or barely effective organizational and presentational skills.					
	Fail	Demonstrate evidence of little or no grasp of evidence of logical and independent thinking. Misuse of data and results and/or unable to diminimally effective or ineffective.	. Limited use of secondary sources and no	critical comparison of them.			
Course Type	Project-ba	ased course					
Course Teaching	Activitie	s	Details	No. of Hours			
& Learning Activities	Meeting	with supervisor		36			
	Reading	/ Self study		84			
Assessment Methods and Weighting	Methods	3	Details	Weighting in final course grade (%)			
	Oral pres	sentation	including supervisor's comments (10%)	30			
	Research	n report		70			
Required/recommended reading and online materials	To be pro	vided by individual project supervisor					

Offering Department	Physics					
	1 Hysics	Quota				
Course Co-ordinator	Prof J Wang, Physics (jianwang@hku.hk)	<u> </u>				
Teachers Involved	Prof J Wang, Physics					
Course Objectives	The aim of the course is show how the power of computers enables to computational approach to solving physics problems to be adopted, which is distinct from, and complimentary to, traditional experimental and theoretical approaches. The material covered will be found useful in any project or problem solving work that contains a strong computational or data analysis element. The course is designed such that a significant fraction of the student's time is spent actually programming specific physical problems rather than learning abstract techniques.					
Course Contents & Topics	The course will cover the following problems: Introductory computational physics and computer algebra, integration and differentiation, interpolation and extrapolation, ordinary differential equation such as those of classical mechanics, partial differential equations (such as the Maxwell's equation, the diffusion equation, and the Schrodinger equation), matrix methods (such as systems of equations and eigenvalue problems applied to Poisson's equation and electronic structure calculations), Monte Carlo (Metropolis algorithm) and other simulation methods (such as molecular dynamics), and several physics projects.					
Course Learning Outcomes	On successful completion of this course, students should be able to:  1. Demonstrate knowledge in essential methods and techniques for 2. Apply Monte Carlo method and other simulation methods to solve physical problems. 3. Employ appropriate numerical method to interpolate and extreace experiments. 4. Use appropriate numerical method to solve the differential equation systems.	numerical computation ve deterministic as we rapolate data collecte	ell as probabilistic			
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in (PHYS3150 Theoretical physics or MATH3301 Algebra I o Functions of a complex variable or MATH3405 Differential equal following courses: PHYS3350 Classical mechanics, PHYS355 Electromagnetism, PHYS3550 Statistical mechanics and thermodyn	tions); and Pass in a 1 Quantum mechan	any three of the			

Offer in 2014 - 2015	Y 1s	t sem	Ex	amination	Dec	
Offer in 2015 - 2016	Υ	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 lab skills and techniques. Critical use of data and results to draw appropriate and insightful conclusions.				
	В	the course learning outcomes. Si apply knowledge to familiar and s	d of a broad range of knowledge and skill how evidence of analytical and critical abi some unfamiliar situations. Apply effective hiques. Correct use of data of results to dra	lities and logical to organizational and	thinking, and ability to d presentational skills.	
	С	learning outcomes. Show evidence knowledge to most familiar situation	lete command of knowledge and skills re ce of some analytical and critical abilities a tions. Apply moderately effective organiz- d techniques. Mostly correct but some erro	and logical thinkin ational and prese	ig, and ability to apply entational 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. 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. Lack of analytical and knowledge to solve problems. O	of command of knowledge and skills re- critical abilities, logical and coherent thinking rganization and presentational skills are relabeled skills and techniques. Misuse of date	ng. Show very little minimally effective	e or no ability to apply or ineffective. Apply	
Course Type	Lecture v	with laboratory component cour	se			
Course Teaching	Activitie	es	Details		No. of Hours	
& Learning Activities	Lectures	S			36	
	Laborate	ory			12	
	Tutorials	S			8	
	Reading / Self study				80	
Assessment Methods and Weighting	Method	s	Details		Weighting in final course grade (%)	
	Assignments				20	
	Examination				40	
	Presentation				15	
	Project i	report			25	
Required/recommended reading and online materials	Project report  Lecture notes provided by Course Coordinator Samuel S.M. Wong: Computational Methods in Physics and Engineering (World Scientific) N.J. Giordano and N. Nakanishi: Computational physics (Pearson Education Inc.).					

PHYS4151 Data analysis an	d modeling in physics (6 credits)	Academic Year	2014			
Offering Department	Physics	Quota				
Course Co-ordinator	Prof H F Chau, Physics (hfchau@hku.hk)					
Teachers Involved	Prof H F Chau, Physics					
Course Objectives	This course covers general modeling and data analysis techniques used in physics and related subjects with special emphasis on their uses in complex systems, nonlinear systems and adaptive systems. The focus is on the basic principles and concepts rather than the use of computer packages. This course provides a solid foundation for students who intended to do computational physics and complex systems research. It also prepares students to work in related industries.					
Course Contents & Topics	Topics include basic data analysis techniques, linear and non-linear fittings, determining the goodness of the fit, basic hypothesis testing techniques, modeling physical and related systems via differential (ordinary and/or partial), difference equations as well as discrete models such as cellular automata, introduction to complex systems, complex adaptive systems and nonlinear dynamics, the use of computer package such as Matlab in modeling and data analysis. The emphasis is on the basic principles and concepts rather than a particular software package or physical model. Depending on the mutual interests of the coordinators and the students, illustrative examples will be drawn from conventional fields such as classical mechanics, electromagnetism and quantum mechanics as well as more recent fields like biophysics, econophysics and sociophysics.					
Course Learning Outcomes	On successful completion of this course, students should be able to:  1. Describe and explain state-of-the-art modeling methods used in physics.  2. Apply basic modeling techniques, together with logical and mathematical reasoning, to situations of the physical world.  3. Analyse and solve problems with the aid of computer packages such as Matlab.  4. Critically interpret experimental data from physics experiments.					
Pre-requisites (and Co-requisites and Impermissible combination)	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					

Offer in 2014 - 2015	Y 2nd	sem		Examination	May		
Offer in 2015 - 2016	Υ	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 outcomes. Show evidence of analytical and to familiar and some unfamiliar situations computer modeling skills and techniques. C	critical abilities, reasoned log using effective organization	ical thinking, and abil al and presentation	ity to apply knowledge skills. Apply effective		
	С	Demonstrate general but incomplete communication outcomes. Show evidence of som knowledge to most familiar situations. Apmoderately effective computer modeling sk results to draw appropriate conclusions.	e analytical and critical abilities ply moderately effective orga	es and logical thinkin nizational and prese	ig, and ability to apply entational 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 computer modeling skills and techniques. Limited ability to use data and results to draw appropriate conclusions.					
	Fail	Demonstrate little or no evidence of commoutcomes. Lack of analytical and critical abknowledge to solve problems. Organizatio minimally effective or ineffective computer to draw appropriate conclusions.	ilities, logical and coherent thin and presentational skills as	inking. Show very little re minimally effective	e or no ability to apply or ineffective. Apply		
Course Type	Lecture w	ith laboratory component course					
Course Teaching	Activities		Details		No. of Hours		
& Learning Activities	Lectures				36		
	Laboratory				12		
	Tutorials				8		
	Reading	g / Self study			80		
Assessment Methods and Weighting	Methods	•	Details		Weighting in final course grade (%)		
	Assignm	ents			10		
	Examination				50		
	Presentation				20		
	Project report				20		
Required/recommended reading and online materials	Lecture notes provided by Course Coordinator J. R. Taylor: An Introduction to Error Analysis (Univ. Sci. Books, 2rd ed., 1996) B. Hahn and D. Valentine: Essential Matlab for Engineers and Scientists (Academic Press, 5th ed., 2013) L. Lam: Nonlinear Physics for Beginners (World Sci., 1998) N. Boccara: Modeling Complex Systems (Springer, 2nd ed., 2012) AL. Barabasi and H. E. Stanley: Fractal Concepts in Surface Growth (CUP, 1995)						

PHYS4350 Advanced class	sical mechanics (6 credits)	Academic Year	2014			
Offering Department	Physics Quota					
Course Co-ordinator	Prof S Q Shen, Physics (sshen@hku.hk)					
Teachers Involved	Prof S Q Shen, Physics					
Course Objectives	Build on the advanced undergraduate level course PHYS3350, this course further discusses concepts and mathematical techniques in classical mechanics through special topics and applications. It serves as an elective course to better prepare students for their postgraduate studies in physics or other related disciplines.					
Course Contents & Topics	Topics include: Hamiltonian principles, Lagrangian formulation of dynamics, nonlinear problems, many body systems, variational principle, generalized coordinates, simple application of Lagrangian equation.					
Course Learning Outcomes	On successful completion of this course, students should be able to:  1. Explain the difference between Newtonian mechanics and analytic.  2. Solve the mechanical problems using Lagrangian formalism.  3. Discuss the connection between classical mechanics and qualiformalism.  4. Apply the variational principle to real physical situations.	cal mechanics.	from Hamiltonian			
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in PHYS3350 Classical mechanics					
Offer in 2014 - 2015	Y 2nd sem	Examination	May			
Offer in 2015 - 2016	Υ					
Course Grade	A+ to F					

Grade Descriptors	A	course learning outcomes. Show strong	vanced level of extensive knowledge and analytical and critical abilities and logical to a wide range of complex, familiar and al skills.	thinking, with evidence of original		
	В	outcomes. Show evidence of analytical	e knowledge and skills required for attai and critical abilities and logical thinking, pply effective organizational and presenta	and ability to apply knowledge to		
	С	learning outcomes. Show evidence of so	mmand of knowledge and skills required ome analytical and critical abilities and log ply moderately effective organizational and	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	outcomes. Lack of analytical and critical	mmand of knowledge and skills required abilities, logical and coherent thinking. Sh on and presentational skills are minimally o	ow very little or no ability to apply		
Course Type	Lecture-l	pased course				
Course Teaching & Learning Activities	Activitie	es	Details	No. of Hours		
& Learning Activities	Lectures	3		36		
	Tutorials	5		12		
	Reading	g / Self study		80		
Assessment Methods and Weighting	Method	s	Details	Weighting in final course grade (%)		
	Assignments			20		
	Examination		3-hour written exam	60		
	Test			20		
Required/recommended reading and online materials	Lecture notes provided by Course Coordinator H. Goldstein, C. Poole, and J. Safko, Classical Mechanics, (Pearson Education Inc, 2004)			Inc, 2004)		

PHYS4351 Advanced quar	ntum mech	nanics (6 credits)	Academic Year	2014			
Offering Department	Physics		Quota				
Course Co-ordinator	Dr W Yac	o, Physics (wangyao@hku.hk)					
Teachers Involved	Dr W Yac	o, Physics					
Course Objectives	mathema elective	Build on the advanced undergraduate level course PHYS3351, this course further discusses concepts and mathematical techniques in quantum mechanics through special topics and applications. It serves as ar elective course to better prepare students for their postgraduate studies in physics or other related disciplines					
Course Contents & Topics	non-dege	particles. Pauli exclusion principle. Fermion and bosons. nerate and degenerate perturbation theory. Time dep tion, partial waves and Born approximation. Variational r	endent perturbation t				
Course Learning Outcomes	1. Review 2. Apply p 3. Demor	On successful completion of this course, students should be able to:  1. Review the perturbation theory and some other approximation methods on various quantum systems.  2. Apply physics principles to describe the physical properties of various quantum systems.  3. Demonstrate knowledge and discuss the underlying physical concepts associated with the selected quantum systems.					
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in P	Pass in PHYS3351 Quantum mechanics					
Offer in 2014 - 2015	Y 2nd	d sem	Examination	May			
Offer in 2015 - 2016	Υ		·				
Course Grade	A+ to F						
Grade Descriptors	Α	Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.					
	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  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	Lecture-based course					
Course Teaching & Learning Activities	Activities	Details	No. of Hours				
	Lectures		36				
	Tutorials		12				
	Reading / Self study		80				
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)				
	Assignments		20				
	Examination	3-hour written exam	60				
	Test		20				
Required/recommended reading and online materials		Lecture notes provided by Course Coordinator D. J. Griffiths: Introduction to Quantum Mechanics (Pearson Prentice Hall, 2004, 2nd edition).					
Course Website	http://www.physics.hku.hk/~phys4351	/					

	ranced electromagnetism (6 credits)			ademic Year	2014	
Offering Department	Physics		Qu	ıota		
Course Co-ordinator	Prof X D	ui, Physics <i>(xdcui@hku.hk)</i>				
Teachers Involved	Prof X D	ui, Physics				
Course Objectives	mathema elective	Build on the advanced undergraduate level course PHYS3450, this course further discusses concepts an mathematical techniques in electromagnetism through special topics and applications. It serves as an elective course to better prepare students for their postgraduate studies in physics or other related disciplines.				
Course Contents & Topics		Topics include Maxwell's Equations, Poynting theorem, wave equations, reflection and transmission of waves, wave guides, retarded potentials, gauge transformations, dipole radiation, special theory of				
Course Learning Outcomes	On succe	On successful completion of this course, students should be able to:				
Pre-requisites (and Co-requisites and Impermissible combination)	2. Apply N 3. Evalua 4. Formul	Review and discuss the fundamental physics in classical electrodynamics     Apply Maxwell's equations to analyze complicated electrostatic and magnetic phenomena     Evaluate how special relativity is incorporated in the study of electromagnetism     Formulate and solve problems in electromagnetism using appropriate mathematical techniques  Pass in PHYS3450 Electromagnetism				
Offer in 2014 - 2015	Y 1st	sem	Ev	amination	Dec	
Offer in 2015 - 2016	Υ 130	Sem		ammation	Dec	
Course Grade	A+ to F					
Grade Descriptors	A+ 10 F					
	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 kn	owledge and skills required	for attaining some		
	D	Demonstrate partial but limited command of kn outcomes. Show evidence of some coherent Show limited ability to apply knowledge to so presentational skills.	and logical thinking, but wit	h limited analytical	of the course learning and critical abilities.	
	D Fail	outcomes. Show evidence of some coherent Show limited ability to apply knowledge to so	and logical thinking, but wit olve problems. Apply limited of knowledge and skills re s, logical and coherent think	th limited analytical d or barely effective equired for attaining ing. Show very little	of the course learning I and critical abilities. The organizational and I the course learning The course learning The course learning	
Course Type	Fail	outcomes. Show evidence of some coherent Show limited ability to apply knowledge to so presentational skills.  Demonstrate little or no evidence of command outcomes. Lack of analytical and critical abilitie	and logical thinking, but wit olve problems. Apply limited of knowledge and skills re s, logical and coherent think	th limited analytical d or barely effective equired for attaining ing. Show very little	of the course learning I and critical abilities. The organizational and I the course learning The course learning The course learning	
Course Teaching	Fail	outcomes. Show evidence of some coherent Show limited ability to apply knowledge to so presentational skills.  Demonstrate little or no evidence of comman outcomes. Lack of analytical and critical abilitie knowledge to solve problems. Organization and sed course	and logical thinking, but wit olve problems. Apply limited of knowledge and skills re s, logical and coherent think	th limited analytical d or barely effective equired for attaining ing. Show very little	of the course learning I and critical abilities. The organizational and I the course learning The course learning The course learning	
Course Teaching	Fail Lecture-b	outcomes. Show evidence of some coherent Show limited ability to apply knowledge to so presentational skills.  Demonstrate little or no evidence of comman outcomes. Lack of analytical and critical abilitie knowledge to solve problems. Organization and sed course	and logical thinking, but wit olve problems. Apply limited of knowledge and skills re s, logical and coherent think presentational skills are min	th limited analytical d or barely effective equired for attaining ing. Show very little	of the course learning and critical abilities. e organizational and g the course learning e or no ability to apply neffective.  No. of Hours	
Course Teaching	Fail Lecture-b Activitie	outcomes. Show evidence of some coherent Show limited ability to apply knowledge to so presentational skills.  Demonstrate little or no evidence of comman outcomes. Lack of analytical and critical abilitie knowledge to solve problems. Organization and sed course	and logical thinking, but wit olve problems. Apply limited of knowledge and skills re s, logical and coherent think presentational skills are min	th limited analytical d or barely effective equired for attaining ing. Show very little	of the course learning and critical abilities. e organizational and g the course learning e or no ability to apply neffective.  No. of Hours	
Course Teaching	Fail  Lecture-b  Activitie  Lectures  Tutorials	outcomes. Show evidence of some coherent Show limited ability to apply knowledge to so presentational skills.  Demonstrate little or no evidence of comman outcomes. Lack of analytical and critical abilitie knowledge to solve problems. Organization and sed course	and logical thinking, but wit olve problems. Apply limited of knowledge and skills re s, logical and coherent think presentational skills are min	th limited analytical d or barely effective equired for attaining ing. Show very little	of the course learning and critical abilities. e organizational and g the course learning e or no ability to apply neffective.	
Course Teaching & Learning Activities	Fail  Lecture-b  Activitie  Lectures  Tutorials	outcomes. Show evidence of some coherent Show limited ability to apply knowledge to so presentational skills.  Demonstrate little or no evidence of command outcomes. Lack of analytical and critical abilitie knowledge to solve problems. Organization and sed course	and logical thinking, but wit olve problems. Apply limited of knowledge and skills re s, logical and coherent think presentational skills are min	h limited analytical d or barely effective equired for attaining ing. Show very little immally effective or i	of the course learning and critical abilities. e organizational and g the course learning e or no ability to apply neffective.  No. of Hours  36	
Course Type Course Teaching & Learning Activities  Assessment Methods and Weighting	Fail  Lecture-b  Activitie  Lectures  Tutorials  Reading	outcomes. Show evidence of some coherent Show limited ability to apply knowledge to so presentational skills.  Demonstrate little or no evidence of command outcomes. Lack of analytical and critical abilities knowledge to solve problems. Organization and sed course  Sed course	and logical thinking, but wit olive problems. Apply limited d of knowledge and skills re s, logical and coherent think presentational skills are min	h limited analytical d or barely effective equired for attaining ing. Show very little immally effective or i	of the course learning and critical abilities. e organizational and g the course learning e or no ability to apply neffective.  No. of Hours  36  12  80  Weighting in fina	

	Test		30
Required/recommended reading and online materials	Lecture notes provided by Course Coordinator D. J. Griffiths: Introduction to Electrodynamics, 3rd	d ed., (Prentice-Hall, 1999).	

PHYS4550 Advanced statis		anios (o creato)		Academic Year	2014
Offering Department	Physics			Quota	
Course Co-ordinator	Dr Y Tu, P	hysics (yanjuntu@hku.hk)			
Teachers Involved	Dr Y Tu, P	hysics			
Course Objectives	Build on the advanced undergraduate level course PHYS3550, this course further discusses concepts ar mathematical techniques in statistical mechanics through special topics and applications. It serves as a elective course to better prepare students for their postgraduate studies in physics or other relatedisciplines.				
Course Contents & Topics	Topics include: Statistical ensembles for isolated and open systems. Equilibrium fluctuations. Order an disorder phase transition. Mean field and Landau theory. Classical ideal gas, quantum ideal gas. Quantum fluid.				
Course Learning Outcomes	On successful completion of this course, students should be able to:				
	<ol><li>Apply th world.</li></ol>	e and explain the fundamental physical plese principles, together with logical and and solve problems with the aids of ma	d mathematical rea	asoning, to situatior	ns of the physica
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in Ph	YS3550 Statistical mechanics & thermo	dynamics		
Offer in 2014 - 2015	Y 1st s	sem		Examination	Dec
Offer in 2015 - 2016	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-ba	sed course			
Course Teaching	Activities		Details		No. of Hours
& Learning Activities	Lectures				36
	Tutorials				12
	Reading /	Self study			80
Assessment Methods and Weighting	Methods		Details		Veighting in fina course grade (%
	Assignme	nts			2
	Examinati		3-hour written exa	m	60
	Test				2
<b>5</b>					
Required/recommended reading and online materials	F. Mandl: S C. Kittel: E	tes provided by Course Coordinator Statistical Physics, 2nd edition (John Wilk lementary Statistical Physics (Robert E. s & G.L. Salinger: Thermodynamics, Ki 186)	Krieger, 1988)	Statistical Thermody	ynamics (Addiso

PHYS4650 Stellar phys	Academic Year	2014				
Offering Department	Quota					
Course Co-ordinator	Dr S C Y Ng, Physics (ncy@bohr.physics.hku.hk)	Dr S C Y Ng, Physics (ncy@bohr.physics.hku.hk)				
Teachers Involved	Dr S C Y Ng, Physics	Dr S C Y Ng, Physics				

Course Objectives	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	Topics include: Definition of stars. The H-R diagram. Stellar structure equations. Polytropic model. Elementary stellar radiation processes. Simple stellar nuclear processes. Saha equation. Stability of stars. Zero-age main sequence stars and their evolution. The solar neutrino problem. Late stage evolution of stars. Supernova explosion. If time permits, special topics selected from below will be briefly mentioned: star formation, brown dwarfs and planets, AGB stars and planetary nebulae, binary stars and their evolution, Cepheid variables and theory of stellar pulsation, and introduction to helioseismology.				
Course Learning Outcomes	1. Describ 2. Analytic of stellar s 3. Critical evolution of	On successful completion of this course, students should be able to:  1. Describe what is stars and to classify different types of stars.  2. Analytically calculate and solve problems related to the structure and evolution of stars including the use of stellar structure equations and Saha equations.  3. Critically examine the physical processes occurring in stars and how these processes affect the evolution of stars.  4. Assess selected research papers in the field of stellar astrophysics.			
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in Ph	HYS3651 The physical universe and	I PHYS3351 Quantum n	nechanics	
Offer in 2014 - 2015	Y 2nd	sem		Examination	May
Offer in 2015 - 2016	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	Fail  Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.			
Course Type	Lecture-ba	ased course			
Course Teaching	Activities	<b>S</b>	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 (%)
	Assignme	ents			10
	Examinat	ion	2-hour written exar	n	60
	Project re	eports			10
	Test	Test			20
Required/recommended reading and online materials	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) Padmanabhan, T.: Theoretical astrophysics Volume 1 (CUP, 2000)				
Course Website	http://www	.physics.hku.hk/~phys4650/			

PHYS4651 Selected topics	Academic Year	2014				
Offering Department	Physics					
Course Co-ordinator	Prof K S Cheng, Physics (hrspksc@hku.hk)					
Teachers Involved	Prof K S Cheng, Physics					
Course Objectives	To introduce students some current topics in astrophysics. It may b as background to research work in astrophysics.	e taken as a self-con	tained course or			
Course Contents & Topics	Topics include: Brief review of thermodynamical equilibrium, relativity. Physics of shock wave. Properties of Cosmic rays. Physic black holes, white dwarfs, neutron stars and quark stars. Elements of dynamical theories, observational parameters.	s of compact stellar	objects including			

Course Learning Outcomes	1. Apply p 2. Explain 3. Demon	On successful completion of this course, students should be able to:  1. Apply physics principles to describe the physical properties of various astrophysical systems.  2. Explain the observed phenomena of some selected astrophysical objects.  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 combination)		PHYS3351 Quantum mechanics o s & thermodynamics or PHYS3651 T	9	ism or PHYS	3550 Statistical	
Offer in 2014 - 2015	N		Exa	mination		
Offer in 2015 - 2016	Υ				'	
Course Grade	A+ to F					
Grade Descriptors	A	ical thinking, with	d for attaining all the evidence of original uations. 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.				
	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	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.				
Course Type	Lecture-b	ased course				
Course Teaching	Activitie	S	Details		No. of Hours	
& Learning Activities	Lectures				36	
	Tutorials				8	
	Reading	/ Self study			80	
Assessment Methods and Weighting	Methods	3	Details		leighting in final ourse grade (%)	
	Assignm	ents			10	
	Examina	tion	2-hour written exam		50	
	Presenta	ition			15	
	Test				25	
Required/recommended reading and online materials	S. L. Shap B. W. Publishing	otes provided by Course Coordinator piro and S. A. Teukolsky: Black Holes Carroll & D. A. Ostlie: An Ir g Company, 2007, 2nd edition) leng: Relativity, Gravitation and Cosr	s, White Dwarfs and Neutron stroduction to Modern Asi	trophysics (A	Addison-Wesley	

PHYS4652 Planetary scien	ce (6 credits)	Academic Year	2014			
Offering Department	Physics	Quota				
Course Co-ordinator	Dr M H Lee, Physics (mhlee @hku.hk)					
Teachers Involved	Dr M H Lee, Physics					
Course Objectives		This course provides students with a modern advanced-level understanding of the properties of our Sola System and planetary systems around other stars and of the physical, chemical, and geological processes that govern them.				
Course Contents & Topics	Terrestrial planets, giant planets, moons and minor bodies in energy transport; planetary atmospheres, surfaces, and interiors;					
Course Learning Outcomes	On successful completion of this course, students should be able  1. Describe key aspects of our Solar System and extrasolar observations and experiments.  2. Explain essential elements of the processes governing the programments.  3. Apply physical principles to construct models for some basic evolution of planetary bodies.	ar planetary systems a	es.			
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in PHYS3651 The physical universe or (PHYS3350 Classical mechanics and PHYS3550 Statistical mechanics & thermodynamics)					
Offer in 2014 - 2015	N	Examination				
Offer in 2015 - 2016	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	learning outcomes. Show evidence of	command of knowledge and skills require of some analytical and critical abilities and Apply moderately effective organizational	logical thinking, and ability to apply		
	D					
	Fail	Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.				
Course Type	Lecture-l	based course				
Course Teaching & Learning Activities	Activities		Details	No. of Hours		
& Learning Activities	Lectures			36		
	Tutorials			12		
	Reading / Self study			80		
Assessment Methods and Weighting	Method	s	Details	Weighting in final course grade (%)		
	Assignments			20		
	Essay			15		
	Examination		2-hour written exam	50		
	Test			15		
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://mo	odle.hku.hk				

PHYS4653 Cosmology (6 credits)			Academic Year	2014		
Offering Department	Physics		Quota			
Course Co-ordinator	Prof K S	Cheng, Physics (hrspksc@hku.hk)				
Teachers Involved		Prof K S Cheng, Physics Dr T Jumpei, Physics				
Course Objectives	mathema	of the course is to offer an advanced introduction to cosm tical formulation used to model the evolution and dynamics scussion of the big bang theory and structure and galaxy fo	s of the universe, and			
Course Contents & Topics	The big b	clude: The visible universe. Empirical basis for cosmologic bang models. Thermodynamics of the early universe. Prim Inflationary models. The cosmological constant problem. S	ordial nucleosynthes	sis. The very ear		
Course Learning Outcomes	On successful completion of this course, students should be able to:  1. Apply physics principles to describe the observational/experimental aspects of cosmology 2. Explain the observed phenomena of cosmology 3. Demonstrate knowledge and discuss the underlying physical concepts associated with the cosmologic evolution of the universe and with the dynamic interactive processes that take place in the universe.					
	evolution	of the universe and with the dynamic interactive processes	that take place in th	e universe.		
(and Co-requisites and		of the universe and with the dynamic interactive processes HYS3651 The physical universe or PHYS3652 Principles of	· · · · · · · · · · · · · · · · · · ·	e universe.		
(and Co-requisites and Impermissible combination)	Pass in F	, , , , , , , , , , , , , , , , , , ,	· · · · · · · · · · · · · · · · · · ·	e universe.		
(and Co-requisites and Impermissible combination) Offer in 2014 - 2015	Pass in F	PHYS3651 The physical universe or PHYS3652 Principles of	of astronomy			
(and Co-requisites and Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016	Pass in F	PHYS3651 The physical universe or PHYS3652 Principles of	of astronomy			
Pre-requisites (and Co-requisites and Impermissible combination)  Offer in 2014 - 2015  Offer in 2015 - 2016  Course Grade  Grade Descriptors	Pass in F Y 2n N	PHYS3651 The physical universe or PHYS3652 Principles of	Examination  owledge and skills requires and logical thinking, with	May  ed for attaining all the hevidence of origina		
(and Co-requisites and Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade	Pass in F  Y 2n  N  A+ to F	PHYS3651 The physical universe or PHYS3652 Principles of discrete	f astronomy  Examination  Examination  owledge and skills requires and logical thinking, wit familiar and unfamiliar si	May  ed for attaining all the h evidence of origina tuations. Apply highly ining at least most o hinking, and ability to		
(and Co-requisites and Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade	Pass in F  Y 2n  N  A+ to F	Demonstrate thorough mastery at an advanced level of extensive kn course learning outcomes. Show strong analytical and critical abilitie 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 at the course learning outcomes. Show evidence of analytical and crit	Examination  Examination  owledge and skills requires and logical thinking, wit familiar and unfamiliar si and skills required for attacal abilities and logical trictive organizational and publicities and logical trictive organizational and publicities and logical thinking thinking thinking the statement of the	May  ed for attaining all the hevidence of origina tuations. Apply highly ining at least most on hinking, and ability to presentational skills.  g most of the course g, and ability to apply		

Course Type	Fail	Show limited ability to applipresentational skills.  Demonstrate little or no evioutcomes. Lack of analytica	of some coherent and logical thinking, but with lim y knowledge to solve problems. Apply limited or dence of command of knowledge and skills require and critical abilities, logical and coherent thinking. Is. Organization and presentational skills are minimal	barely effective organizational and ed for attaining the course learning Show very little or no ability to apply	
Course Teaching	Activities		Details	No. of Hours	
& Learning Activities	Lectures		Details	36	
	Tutorials			12	
	Reading / Self study			80	
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	
	Assignm	ents		10	
	Examination		2-hour written exam	50	
	Presentation			15	
	Test			25	
Required/recommended reading and online materials	M. Lachie M. Rowar P. Coles	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) P. Coles and F. Lucchin: Cosmology: The Origin and Evolution of Cosmic Structure (John Wiley Chichester, 1995)			

	ity (6 credit	ts)		Academic Year	2014			
Offering Department	Physics		C	Quota				
Course Co-ordinator	Dr K M Le	Dr K M Lee, Physics (kmlee @lily.physics.hku.hk)						
Teachers Involved	Dr K M Le	e, Physics						
Course Objectives		uce students to the field of general revolution for astrophysical and cosmological ap	, ,	•	nd analytical tools			
Course Contents & Topics	transport field equa	The Principle of equivalence. Inertial observers in a curved space-time. Vectors and tensors. Parallel transport and covariant differentiation. The Riemann tensor. The matter tensor. The Einstein gravitational field equations. The Schwarzschild solution. Black holes. Interior equations for spherically symmetric stars. Gravitational waves.						
Course Learning Outcomes	<ol> <li>Apply t systems in</li> <li>Explair Newtonian</li> <li>Demon</li> </ol>	On successful completion of this course, students should be able to:  1. Apply the mathematical and physical ideas of the theory of general relativity for the study of various systems in astrophysics and cosmology.  2. Explain the observational effects at the scale of the Solar System that cannot be described by Newtonian gravity from a general relativistic point of view.  3. Demonstrate knowledge and discuss the dynamic interactive physical processes in astrophysics by using a general relativistic approach.						
Pre-requisites (and Co-requisites and mpermissible combination)	Pass in P	HYS2055 Introduction to relativity and	PHYS3350 Classical m	nechanics				
Offer in 2014 - 2015	Y 1st	sem	E	Examination	Dec			
Offer in 2015 - 2016	N							
	A L to E	A+ to F						
Course Grade	AT IU F							
Course Grade Grade Descriptors	A	Demonstrate thorough mastery at an advanc course learning outcomes. Show strong ana thought, and ability to apply knowledge to a effective organizational and presentational sh	lytical and critical abilities an wide range of complex, fam	nd logical thinking, with	h evidence of original			
		course learning outcomes. Show strong ana thought, and ability to apply knowledge to a	lytical and critical abilities an wide range of complex, fam ills.  ad range of knowledge and size of analytical and critical	nd logical thinking, with niliar and unfamiliar sit skills required for atta abilities and logical th	h evidence of original tuations. Apply highly ining at least most of hinking, and ability to			
	A	course learning outcomes. Show strong ana thought, and ability to apply knowledge to a effective organizational and presentational shows the course learning outcomes. Show evider the course learning outcomes. Show evider	lytical and critical abilities an wide range of complex, fam wilds.  ad range of knowledge and a ace of analytical and critical iliar situations. Apply effective and of knowledge and skills analytical and critical abilitie	nd logical thinking, with hillar and unfamiliar sites skills required for atta abilities and logical the e organizational and p is required for attaining es and logical thinking	h evidence of original tuations. Apply highly ining at least most of ninking, and ability to presentational skills. g most of the course g, and ability to apply			
	В	course learning outcomes. Show strong ana thought, and ability to apply knowledge to a effective organizational and presentational shows the course learning outcomes. Show evider apply knowledge to familiar and some unfam Demonstrate general but incomplete commlearning outcomes. Show evidence of some	lytical and critical abilities an wide range of complex, fam wide range of knowledge and since of analytical and critical diliar situations. Apply effective and of knowledge and skills analytical and critical abilitie moderately effective organizaknowledge and skills required than displaying the control of the control o	nd logical thinking, with illiar and unfamiliar sit- skills required for atta abilities and logical the e organizational and p s required for attaining es and logical thinking attional and presentation ed for attaining some c with limited analytical	h evidence of original tuations. Apply highly ining at least most of hinking, and ability to presentational skills.  g most of the course g, and ability to apply onal skills.  of the course learning and critical abilities.			
	B C	course learning outcomes. Show strong ana thought, and ability to apply knowledge to a effective organizational and presentational shad becomes a become a course learning outcomes. Show evider apply knowledge to familiar and some unfamed becomes the course general but incomplete commitering outcomes. Show evidence of some knowledge to most familiar situations. Apply the Demonstrate partial but limited command of outcomes. Show evidence of some coherer show limited ability to apply knowledge to	lytical and critical abilities an wide range of complex, fam wide range of knowledge and side of analytical and critical aliar situations. Apply effective and of knowledge and skills analytical and critical abilitie moderately effective organizations with the control of the c	nd logical thinking, with initial and unfamiliar since with initial and unfamiliar since skills required for attational and post of thinking attaining experience with limited analytical ted or barely effective required for attaining some of the work of the state of	h evidence of original tuations. Apply highly tining at least most of ninking, and ability to presentational skills.  If most of the course g, and ability to apply and skills.  If the course learning and critical abilities, e organizational and g the course learning a or no ability to apply the course learning and critical abilities.			
Grade Descriptors	A B C D	course learning outcomes. Show strong ana thought, and ability to apply knowledge to a effective organizational and presentational sl Demonstrate substantial command of a brox the course learning outcomes. Show evider apply knowledge to familiar and some unfam Demonstrate general but incomplete commelearning outcomes. Show evidence of some knowledge to most familiar situations. Apply Demonstrate partial but limited command of outcomes. Show evidence of some coherer show limited ability to apply knowledge to presentational skills.  Demonstrate little or no evidence of command outcomes. Lack of analytical and critical ability to apply the command of outcomes. Lack of analytical and critical ability to apply the command of outcomes. Lack of analytical and critical ability to apply the command of the command outcomes. Lack of analytical and critical ability to apply the command of t	lytical and critical abilities an wide range of complex, fam wide range of knowledge and side of analytical and critical aliar situations. Apply effective and of knowledge and skills analytical and critical abilitie moderately effective organizations with the control of the c	nd logical thinking, with initial and unfamiliar since with initial and unfamiliar since skills required for attational and post of thinking attaining experience with limited analytical ted or barely effective required for attaining some of the work of the state of	h evidence of original tuations. Apply highly tining at least most of hinking, and ability to presentational skills.  If most of the course g, and ability to apply and skills.  If the course learning and critical abilities, e organizational and g the course learning a or no ability to apply the course learning and critical abilities.			
	A B C D	course learning outcomes. Show strong ana thought, and ability to apply knowledge to a effective organizational and presentational shows the course learning outcomes. Show evider apply knowledge to familiar and some unfam Demonstrate general but incomplete commelearning outcomes. Show evidence of some knowledge to most familiar situations. Apply Demonstrate partial but limited command of outcomes. Show evidence of some coherer show limited ability to apply knowledge to presentational skills.  Demonstrate little or no evidence of commoutcomes. Lack of analytical and critical abil knowledge to solve problems. Organization as	lytical and critical abilities an wide range of complex, fam wide range of knowledge and side of analytical and critical aliar situations. Apply effective and of knowledge and skills analytical and critical abilitie moderately effective organizations with the control of the c	nd logical thinking, with initial and unfamiliar since with initial and unfamiliar since skills required for attational and post of thinking attaining experience with limited analytical ted or barely effective required for attaining some of the work of the state of	h evidence of original tuations. Apply highly tining at least most of hinking, and ability to presentational skills. g most of the course g, and ability to apply and skills. of the course learning and critical abilities. e organizational and g the course learning e or no ability to apply			

	Tutorials		12				
	Reading / Self study		80				
Assessment Methods and Weighting	Methods Details		Weighting in final course grade (%)				
	Assignments		20				
	Examination	2-hour written exam	60				
	Test		20				
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://www.physics.hku.hk/~phys4654/						

PHYS4655 Interstellar med	· ,			Academic Year	2014		
Offering Department	Physics				Quota		
Course Co-ordinator	Dr M H Le	Dr M H Lee, Physics (mhlee@hku.hk)					
Teachers Involved	Dr M H Le	Dr M H Lee, Physics					
Course Objectives	absorption	This course provides students with an advanced-level understanding of the processes responsible for the absorption and emission of continuum and line radiation from gas and dust in stellar atmospheres and interstellar space, and their astrophysical applications and implications.					
Course Contents & Topics		Gas, dust, atoms, molecules, radiation; physical and radiative properties of hydrogen, helium and heavier elements; hydrogen clouds, molecular clouds; HII regions, nebulae, supernovae.					
Course Learning Outcomes	On succe	essful completion	of this course, stu	dents should be able	to:		
	2. Apply pions.	3. Recognize which process or processes occur or dominate in which object or phase of the interste					
Pre-requisites (and Co-requisites and Impermissible combination)		PHYS3651 The cs & thermodyna		or (PHYS3351 Quan	tum mechanics and P	HY3550 Statistica	
Offer in 2014 - 2015	Y 2nd	d sem			Examination	May	
Offer in 2015 - 2016	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 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 and presentational skills.					
	Fail  Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.						
Course Type	Lecture-b	ased course					
Course Teaching	Activitie	es		Details		No. of Hours	
& Learning Activities	Lectures	<b>,</b>				36	
	Tutorials	•				12	
	Reading	/ Self study				80	
Assessment Methods and Weighting	Methods		Details		Weighting in fina course grade (%		
	Assignm	ents				20	
	Essay					15	
	Examina	ation		2-hour written	exam	50	
	Test					15	
Required/recommended	Lastina	otes provided b					

reading and online materials	S. Kwok: Physics and Chemistry of the Interstellar Medium (University Sciences Book, 2007)	
Course Website	http://moodle.hku.hk	

PHYS4750 Experimental ph	nysics (6 cr	edits)				Academic Year	2014
Offering Department	Physics	Physics				Quota	
Course Co-ordinator	TBC, Physi	BC, Physics ()					
Teachers Involved	TBC, Physi	BC, Physics					
Course Objectives	TBC						
Course Contents & Topics	TBC						
Course Learning Outcomes	TBC						
Pre-requisites (and Co-requisites and Impermissible combination)	ТВС						
Offer in 2014 - 2015	N					Examination	
Offer in 2015 - 2016	N						
Course Grade	A+ to F						
Grade Descriptors	Α						
	В						
	С						
	D						
	Fail						
Course Type	Lecture with	n laboratory compo	onent	course			
Course Teaching & Learning Activities	Activities			Details			No. of Hours
Assessment Methods and Weighting	Methods	Methods Deta		ils			Weighting in final course grade (%)
Required/recommended reading and online materials	TBC						

PHYS4966 Physics interns	ship (6 cred	lits) Academic Year	2014				
Offering Department	Physics	Quota					
Course Co-ordinator	Dr J C S P	un, Physics (jcspun@hku.hk)					
Teachers Involved	TBC, Phys	ics					
Course Objectives	taken norr	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 intern placement. 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	1. Apply pl	sful completion of this course, students should be able to:  nysics or astronomy knowledge students have learnt in their majors to real wo create, propose or design part of the project he/she is working on during the i					
		effective technical and inter-personal communication skills.	nternship.				
Pre-requisites (and Co-requisites and Impermissible combination)	3. Employ Pass in at Physics M		ore courses of the				
(and Co-requisites and Impermissible combination)	3. Employ Pass in a Physics M This capst	effective technical and inter-personal communication skills.  t least 24 credits of advanced level (3XXX level or above) compulsory/coajor, Mathematics/Physics Major or Astronomy Major curriculum.	ore courses of the				
(and Co-requisites and Impermissible combination) Offer in 2014 - 2015	3. Employ Pass in a Physics M This capst	effective technical and inter-personal communication skills.  t least 24 credits of advanced level (3XXX level or above) compulsory/coajor, Mathematics/Physics Major or Astronomy Major curriculum.  one course is for Astronomy, Mathematics/Physics, and Physics Majors students.	ore courses of the				
	3. Employ Pass in ar Physics M This capst Y Sun	effective technical and inter-personal communication skills.  t least 24 credits of advanced level (3XXX level or above) compulsory/coajor, Mathematics/Physics Major or Astronomy Major curriculum.  one course is for Astronomy, Mathematics/Physics, and Physics Majors students.	ore courses of the				
(and Co-requisites and Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016	3. Employ Pass in at Physics M. This capst Y Sum Y	effective technical and inter-personal communication skills.  t least 24 credits of advanced level (3XXX level or above) compulsory/coajor, Mathematics/Physics Major or Astronomy Major curriculum.  one course is for Astronomy, Mathematics/Physics, and Physics Majors students.	ore courses of the ents only.  No Exam  s out the work required tion with supervisor(s), and the ents of the ents				

Course Type	Internship					
Course Teaching & Learning Activities	Activities	Details	No. of Hours			
a 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 final course grade (%)			
	Written report	written report, employer's feedback and oral presentation	100			
Required/recommended reading and online materials	To be provided by individual project sup	ervisor				
Additional Course Information	Students are expected to have satisfactorily completed their Year 3 study. Special consideration be given to those who have completed Year 2.  Satisfactory completion of this course can be counted towards the Capstone requirement. Details of internship will be recorded on the student's transcript. This course will be assessed on "Pass, Fail and Distinction" basis. Students who are interested to enrol in this course should contact the Department to obtain the approval.  Enrolment of this course is not conducted via the online course selection system and should be made through the relevant Department/School office after approval has been obtained from the course coordinator.					

PHYS4999 Physics projec	t (12 credi	Acad	demic Year	2014			
Offering Department	Physics	Quo	ta				
Course Co-ordinator	Dr J K C	Dr J K C Leung, Physics (jkcleung@hku.hk)					
Teachers Involved	Various te	eachers in the department, Physics					
Course Objectives	for those normally themselve 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 taken 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 conte	interested in taking this course should contact their prospective sugents and the nature of their projects in the coming academic year. the prospective supervisor and the course coordinator to take this course coordinator.	They must g				
	reviewing staff men some son	retical and numerical projects: Students will receive training in rest, and make investigation which is close to research work in nature other. The student may need to perform some original calculations, ohisticated derivations, or a combination of both. For numerical proputers to find numerical or simulation results.	e, under the s to fill in mathe	supervision of ematical gaps of			
	staff men including obscured	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 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.					
Course Learning Outcomes	On successful completion of this course, students should be able to:						
	astronom 2. Reviev and resea 3. Criticiz 4. Descrit 5. (For the solutions of the content of the	v the knowledge of a physics or astronomy problem in depth throu arch journals based on what they have learnt in their majors. e existing approaches for solving the selected physics or astronomy be and explain connections between the physical principles and the heoretical or computational projects) identify the key issues of the ently either by analytical or numerical means, and compare the resu	igh literature problem. study problem a problem a problem a lits with predictor astronomical problem.	n. and solve ther stions or existing observations			
Pre-requisites (and Co-requisites and Impermissible combination)	Physics N	at least 24 credits of advanced level (3XXX level or above) com Major, Mathematics/Physics Major or Astronomy Major curriculum. Stone course is for Astronomy, Mathematics/Physics, and Physics M	. ,				
Offer in 2014 - 2015	N	Exar	mination				
Offer in 2015 - 2016	Υ						
Course Grade	A+ to F						
Grade Descriptors	A	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 conclusions. Apply effective organizational and presentational skills.				
	С	logical thinking. Use of relevant information finterpretations and to quote/reference aptly.	Demonstrate general but incomplete grasp of the subject. Evidence of some analytical and critical abilities and logical thinking. Use of relevant information from sources, showing ability to make comparisons between different interpretations and to quote/reference aptly. Mostly correct but some erroneous use of data and results to draw appropriate conclusions. Apply moderately effective organizational and presentational skills.			
	D	Demonstrate partial but limited grasp, with retention of some relevant information, 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 lack of analytical and critical abilities, logical a comparison of them. Misuse of data and res presentational skills are minimally effective or	and coherent thinking. Limited use of seconda ults and/or unable to draw appropriate conc	ary sources and no critical		
Course Type	Project-b	pased course				
Course Teaching & Learning Activities	Activitie	es	Details	No. of Hours		
& Learning Activities	Meeting with supervisor			54		
	Reading / Self study			126		
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)		
	Oral presentation		including supervisor's comments (10%)	30		
	Research report			70		
Required/recommended reading and online materials	To be pro	ovided by individual project supervisor				

PHYS6350 Graduate class	sical mech	anics (6 credits	)			Academic Year	2014		
Offering Department	Physics	Physics Quota							
Course Co-ordinator	TBC, Ph	TBC, Physics ()							
Teachers Involved	TBC, Ph	TBC, Physics							
Course Objectives	TBC	ГВС							
Course Contents & Topics	TBC	TBC							
Course Learning Outcomes	TBC								
Pre-requisites (and Co-requisites and Impermissible combination)	TBC								
Offer in 2014 - 2015	N					Examination			
Offer in 2015 - 2016	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	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	outcomes. Lack of	analytica	al and critical abilities,	logical and co	and skills required for attaining herent thinking. Show very little skills are minimally effective or in	or no ability to apply		
Course Type	Lecture-l	based course							
Course Teaching & Learning Activities	Activition	es		Details			No. of Hours		
Assessment Methods and Weighting	Method	ls	Deta	ils			eighting in fina ourse grade (%		
Required/recommended reading and online materials	TBC								

PHYS6351 Graduate	e quantum mechanics (6 credits)	Academic Year	2014

Offering Department	Physics	Physics Quota							
Course Co-ordinator	TBC, Phy	TBC, Physics ()							
Teachers Involved	TBC, Phy	sics							
Course Objectives	TBC								
Course Contents & Topics	TBC								
Course Learning Outcomes	TBC								
Pre-requisites (and Co-requisites and Impermissible combination)	TBC	TBC							
Offer in 2014 - 2015	N					Examination			
Offer in 2015 - 2016	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, reasoned logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations using effective organizational and presentation skills.							
	С	learning outcomes.	Show e	vidence of some analy	tical and critical abi		red for attaining most of the course logical thinking, and ability to apply and presentational skills.		
	D	outcomes. Show e	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning utcomes. 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 resentational skills.						
	Fail	outcomes. Lack of	analytica	al and critical abilities, l	ogical and coherent	lls required for attaining thinking. Show very little a minimally effective or income.	or no ability to apply		
Course Type	Lecture-b	ased course							
Course Teaching & Learning Activities	Activitie	s		Details			No. of Hours		
Assessment Methods and Weighting	Methods	<b>i</b>	Deta	ils			eighting in final ourse grade (%)		
Required/recommended reading and online materials	TBC	TBC							

PHYS6450 Graduate electr	Academic Year	2014						
Offering Department	Physics		Quota					
Course Co-ordinator	TBC, Phy	BC, Physics ()						
Teachers Involved	TBC, Phy	BC, Physics						
Course Objectives	TBC							
Course Contents & Topics	TBC							
Course Learning Outcomes	TBC							
Pre-requisites (and Co-requisites and Impermissible combination)	TBC							
Offer in 2014 - 2015	N		Examination					
Offer in 2015 - 2016	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	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 outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and Show limited ability to apply knowledge to solve problems. Apply limited or barely effective or presentational skills.							
	Fail	Demonstrate little or no evidence of command of knowledge and skill outcomes. Lack of analytical and critical abilities, logical and coherent the knowledge to solve problems. Organization and presentational skills are	hinking. Show very little	or no ability to apply				
Course Type	Lecture-ba	ased course						

Course Teaching & Learning Activities	Activities		Details	No. of Hours
Assessment Methods and Weighting	Methods	Deta	nils	Weighting in final course grade (%)
Required/recommended reading and online materials	TBC			

PHYS6550 Graduate stati	stical mecl	nanics (6 credits	s)			Academic Year	2014	
Offering Department	Physics		Quota					
Course Co-ordinator	TBC, Phy	TBC, Physics ()						
Teachers Involved	TBC, Phy	sics						
Course Objectives	TBC							
Course Contents & Topics	TBC							
Course Learning Outcomes	TBC							
Pre-requisites (and Co-requisites and Impermissible combination)	TBC							
Offer in 2014 - 2015	N					Examination		
Offer in 2015 - 2016	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	outcomes. Show e	vidence y to ap	of some coherent and	d logical thinki	s required for attaining some o ng, but with limited analytical oply limited or barely effective	and critical abilities	
	Fail	outcomes. Lack of	analytic	al and critical abilities, I	ogical and coh	nd skills required for attaining erent thinking. Show very little cills are minimally effective or in	or no ability to app	
Course Type	Lecture-b	pased course						
Course Teaching & Learning Activities	Activitie	es .		Details			No. of Hour	
Assessment Methods and Weighting	Method	S	Deta	ails			eighting in fin ourse grade (%	
Required/recommended reading and online materials	TBC							

PHYS6551 Solid state phys	lits) Academic Year	2014				
Offering Department	Physics	Quota				
Course Co-ordinator	TBC, Physics ()					
Teachers Involved	TBC, Phys	ics				
Course Objectives	TBC					
Course Contents & Topics	TBC					
Course Learning Outcomes	TBC					
Pre-requisites (and Co-requisites and Impermissible combination)	TBC					
Offer in 2014 - 2015	N	Examination				
Offer in 2015 - 2016	Υ					
Course Grade	A+ to F					
Grade Descriptors	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 situal effective organizational and presentational skills.					
	Demonstrate substantial command of the knowledge and skills required for attaining most of the course I					

Required/recommended reading and online materials	TBC				234.00 g.440 (70)	
Assessment Methods and Weighting	Methods		Details		Weighting in final course grade (%)	
Course Teaching & Learning Activities	Activiti	es	Details		No. of Hours	
Course Type	Lecture-	based course				
	Fail	outcomes. Lack of	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.			
	D Demonstrate partial but limited command of knowledge and skills re outcomes. Show evidence of some coherent and logical thinking, Show limited ability to apply knowledge to solve problems using presentational skills.				ith limited analytical and critical abilities.	
	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.					
	В			ritical abilities, reasoned logic g effective organizational and	al thinking, and ability to apply knowledge d presentation skills.	

PHYS6650 Stellar atmosp	heres (6 cr	edits)				Academic Year	2014	
Offering Department	Physics					Quota		
Course Co-ordinator	TBC, Phy	TBC, Physics ()						
Teachers Involved	TBC, Phy	/sics						
Course Objectives	TBC	TBC						
Course Contents & Topics	TBC							
Course Learning Outcomes	TBC							
Pre-requisites (and Co-requisites and Impermissible combination)	TBC							
Offer in 2014 - 2015	N					Examination		
Offer in 2015 - 2016	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	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.						
	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. Apply moderately effective observation skills and techniques. Mostly correct but some erroneous use of data and results to draw appropriate conclusions.						
	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 using limited or barely effective organizational and presentational skills.						
	Fail	outcomes. Lack of	analytic	al and critical abilities, I	ogical and c	e and skills required for attaining coherent thinking. Show very little skills are minimally effective or in	or no ability to apply	
Course Type	Lecture-b	ased course						
Course Teaching & Learning Activities	Activitie	es		Details			No. of Hours	
Assessment Methods and Weighting	Methods	s	Deta	ails			eighting in final ourse grade (%)	
Required/recommended reading and online materials	TBC							

PHYS6750 Nanophysics (6 credits)			Academic Year	2014		
Offering Department	ffering Department Physics					
Course Co-ordinator	TBC, Physics ()	TBC, Physics ()				
Teachers Involved	TBC, Physics					
Course Objectives	TBC					

Course Contents & Topics	TBC						
Course Learning Outcomes	TBC						
Pre-requisites (and Co-requisites and Impermissible combination)	TBC						
Offer in 2014 - 2015	N	N Examination					
Offer in 2015 - 2016	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 course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of c 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 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	pased course					
Course Teaching & Learning Activities	Activitie	es		Details			No. of Hours
Assessment Methods and Weighting	Method						eighting in final ourse grade (%)
Required/recommended reading and online materials	TBC						

<b>ENVS3006 Environmental</b>	radiation (6	credits)	Academic Year	2014				
Offering Department	Physics		Quota					
Course Co-ordinator	Dr J K C Le	Dr J K C Leung, Physics (jkcleung@hku.hk)						
Teachers Involved	Dr J K C Le	eung, Physics						
Course Objectives	techniques	rse, students will learn about various kinds of radiation to detect them, the methods to trace them and to associate the hazard in events of nuclear accidents or in	sess their hazard to the					
Course Contents & Topics	nuclear poi impact to measuring	course will cover naturally occurring radiation sources and man-made radiation sources including ear power plants; transport models for radionuclides in the environment; nuclear accidents and it act to the environment; radiation risk assessment and emergency preparedness; techniques for suring low level radioactivities; nuclear techniques in ecology; concept of radiation protection to an species and non-human species.						
Course Learning Outcomes	1. Realise s 2. Explain a 3. Detect a 4. Justify, c	sful completion of the course, students should be able sources and transport of radionuclides in the environmend and assess the impact to the environment from the use and measure low level radioactivities in environmental suptimize, and assess the risk of using radiation and nue and contrast the environmental impacts from nuclear	nent. e of nuclear energies. samples. clear technologies.	s of energy.				
Pre-requisites (and Co-requisites and Impermissible combination)		YS2265 Modern physics or CHEM2041 Principles of b course or ENVS2002 Environmental data analysis	of chemistry or ENVS20	01 Environmenta				
Offer in 2014 - 2015	Y 1st s	em	Examination	Dec				
Offer in 2015 - 2016	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. Apply highly effective lab skills and techniques. Critical use of data and results to draw appropriate and insightful conclusions.							
	В	Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills. Apply effective lab skills and techniques. Correct use of data of results to draw appropriate conclusions.						
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills. Apply moderately effective lab skills and techniques. Mostly correct but some erroneous use of data and results to draw						

		appropriate conclusions.					
	D	ning some of the course learning d analytical and critical abilities. rely effective organizational and y to use data and results to draw					
	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.					
Course Type	Lecture v	vith laboratory component course					
Course Teaching & Learning Activities	Activitie	9\$	Details	No. of Hours			
a Learning Activities	Lectures	3		36			
	Laborato	ory		2			
	Field wo	rk		8			
	Tutorials	3		8			
	Reading	/ Self study		80			
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)			
	Assignm	nents		20			
	Examina	ation	2-hour written exam	60			
	Laborato	ory reports		10			
	Presenta	ation		10			
Required/recommended reading and online materials	Merril Eisenbud and Thomas Gesell: Environmental Radioactivity: from Natural, Industrial, and I Sources (Academic Press, 1997) Robert C. Morris: The Environmental Case for Nuclear Power (Paragon House, 2000) David Bodansky: Nuclear Energy - Principles, Practices and Prospects (American Institute of Press, 1996)						
Course Website	http://mod	odle.hku.hk					

ENVS3010 Sustainable en	ergy and er	vironment (6 credits)	Academic Year	2014				
Offering Department	Physics		Quota					
Course Co-ordinator	Prof A B D	Prof A B Djurisic, Physics (dalek@hku.hk)						
Teachers Involved	Prof A B D	jurisic, Physics						
Course Objectives	technologi The technologi	In this course, the students will learn about sustainability and environmental impact of different energustechnologies, including conventional energy sources as well as renewable and/or clean energy sources. The technological challenges, potential for future development, and environmental impacts (communitational), and global) will be discussed.						
Course Contents & Topics	methods technologi	The course will cover energy production and use, environmental impact of energy use, fossil fuels an methods for making them more sustainable, clean fuels, electricity generation, renewable energy technologies (with emphasis on biomass, wind and solar energy), hydrogen, energy storage, and energy conservation.						
Course Learning Outcomes	1. Define to 2. Explain	On successful completion of the course, students should be able to:  1. Define the concept of sustainable development.  2. Explain the challenges and potential for development of various energy technologies.  3. Compare the environmental impact of conventional and new energy technologies.						
Pre-requisites	Pass in PHYS2260 Heat and waves or CHEM2041 Principles of chemistry or ENVS2001 Environment field and lab course or ENVS2002 Environmental data analysis							
	field and la	b course or ENVS2002 Environmental data analysi	s					
mpermissible combination)	field and la	b course or ENVS2002 Environmental data analysi	S Examination					
mpermissible combination) Offer in 2014 - 2015		b course or ENVS2002 Environmental data analysi	s					
mpermissible combination)  Offer in 2014 - 2015  Offer in 2015 - 2016	N	b course or ENVS2002 Environmental data analysi	s					
(and Co-requisites and Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade Grade Descriptors	N Y	Demonstrate thorough mastery at an advanced level of exter course learning outcomes. Show strong analytical and critica thought, and ability to apply knowledge to a wide range of coeffective organizational and presentational skills.	Examination  Examination  Insive knowledge and skills required abilities and logical thinking, with	d for attaining all the				
Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade	N Y A+ to F	Demonstrate thorough mastery at an advanced level of exter course learning outcomes. Show strong analytical and critica thought, and ability to apply knowledge to a wide range of co	Examination  Sive knowledge and skills required I abilities and logical thinking, with omplex, familiar and unfamiliar siturely ledge and skills required for attain and critical abilities and logical thinking.	d for attaining all the evidence of origin lations. Apply high hing at least most nking, and ability				
Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade	N Y A+ to F	Demonstrate thorough mastery at an advanced level of exter course learning outcomes. Show strong analytical and critica thought, and ability to apply knowledge to a wide range of coeffective organizational and presentational skills.  Demonstrate substantial command of a broad range of know the course learning outcomes. Show evidence of analytical	Examination  Exami	d for attaining all the evidence of originations. Apply high thing at least most making, and ability esentational skills.  most of the cours and ability to app				

	Fail	outcomes. Lack of analytical and	ce of command of knowledge and skills required d critical abilities, logical and coherent thinking. Shr ganization and presentational skills are minimally	now very little or no ability to apply			
Course Type	Lecture-b	Lecture-based course					
Course Teaching	Activitie	es	Details	No. of Hours			
& Learning Activities	Lectures			36			
	Tutorials			12			
	Reading	/ Self study		80			
Assessment Methods and Weighting	Methods	3	Details	Weighting in final course grade (%)			
	Examina	tion	2-hour written exam	50			
	Presenta	ation		50			
Required/recommended reading and online materials	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 Future (The Open University, 2003) R. M. Dell and D. A. J. Rand: Clean Energy (The Royal Society of Chemistry, 2004)						

Offering Department	Faculty			Quota		
Course Co-ordinator	,	ım, Statistics & Actuarial Science (hr.	ntlkf@hku.hk\	4		
Teachers Involved	Dr K F La Dr W M Y Dr R K W	im, Statistics & Actuarial Science (m.) im, Statistics & Actuarial Science Cheung, Faculty of Science Lui, Faculty of Science Yung, Faculty of Science	muni ©ind.im)			
Course Objectives	and impa	ctives are to give students a holistic of act on civilization and society; to ear, and to introduce to students mail	equip students with bas	sic skills of logical	and quantitative	
Course Contents & Topics	<ul><li>Demarc</li><li>Shared</li><li>Scientifi</li></ul>	e nature and methodology of science ation between science and non-scient features of the sciences c method of mathematics in the historical dev	nce			
	a. Mather - Founda - Mathem - Mathem - Guessti - Differen - Linear a	tion of mathematics atics and advancement of science - atical modelling - an introduction mation ce equations Igebra and matrices s and differential equations	an introduction			
	<ul><li>Probabi</li><li>Probabi</li><li>Statistic</li><li>Confide</li><li>Hypothe</li><li>Decision</li></ul>	b. Statistics - Probability rules - Probabilistic methods - Statistical inference - Confidence intervals estimation - Hypothesis testing - Decision making with statistics - Statistical modelling, and use and misuse of statistics				
Course Learning Outcomes	On succe	ssful completion of this course, stude	ents should be able to:			
		<ol> <li>Describe key aspects of scientific methodology.</li> <li>Describe the key elements of the foundation of mathematics and statistics.</li> <li>Identify the mathematics that underlies scientific problems.</li> <li>Apply logical and quantitative reasoning to re-formulate both real life and scientific problems in mathematical terms, and to interpret their solutions.</li> </ol>				
	<ol> <li>Identify</li> <li>Apply</li> </ol>	the mathematics that underlies scie logical and quantitative reasoning	n of mathematics and st entific problems. to re-formulate both		ntific problems in	
Pre-requisites (and Co-requisites and Impermissible combination)	3. Identify 4. Apply mathema NIL (This cou	the mathematics that underlies scie logical and quantitative reasoning tical terms, and to interpret their solutives is compulsory for all students	n of mathematics and st intific problems. to re-formulate both itions.	real life and scier	·	
(and Co-requisites and Impermissible combination)	3. Identify 4. Apply mathema NIL (This cou	the mathematics that underlies scie logical and quantitative reasoning tical terms, and to interpret their solu	n of mathematics and st intific problems. to re-formulate both itions.	real life and scier	aculty of Science.	
(and Co-requisites and Impermissible combination) Offer in 2014 - 2015	3. Identify 4. Apply mathema NIL (This cou	the mathematics that underlies scie logical and quantitative reasoning tical terms, and to interpret their solutives is compulsory for all students should take this course in their first y	n of mathematics and st intific problems. to re-formulate both itions.	real life and scien	aculty of Science.	
(and Co-requisites and Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016	3. Identify 4. Apply mathema  NIL  (This cou Students  Y 1st	the mathematics that underlies scie logical and quantitative reasoning tical terms, and to interpret their solutives is compulsory for all students should take this course in their first y	n of mathematics and st intific problems. to re-formulate both itions.	real life and scien	aculty of Science.	
(and Co-requisites and	3. Identify 4. Apply mathema NIL (This cou Students Y 1st	the mathematics that underlies scie logical and quantitative reasoning tical terms, and to interpret their solutives is compulsory for all students should take this course in their first y	n of mathematics and st intific problems. to re-formulate both itions.  taking a Science major rear.)	real life and scient offered by the Fate Examination  equired for attaining all ting, and ability to apply	Dec May  the course learning knowledge to a wide	
(and Co-requisites and Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade	3. Identify 4. Apply mathema NIL (This cou Students Y 1st Y A+ to F	the mathematics that underlies scie logical and quantitative reasoning tical terms, and to interpret their solutions is compulsory for all students should take this course in their first years and sem.  Demonstrate thorough mastery of extension outcomes. Show strong analytical and crirange of familiar and unfamiliar situation.	n of mathematics and stantific problems. to re-formulate both attions.  taking a Science major rear.)  taking a Science major rear.)  asive knowledge and skills retitical abilities and logical think ins. Carry out computations concord range of knowledge and dence of analytical and critical familiar situations. Carry out	real life and scient of the Farman of the Fa	Dec May  The course learning knowledge to a wide Apply highly effective thinking, and ability to a careful and correct	
(and Co-requisites and Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade	3. Identify 4. Apply mathema  NIL  (This cou Students  Y 1st  Y  A+ to F	Demonstrate thorough mastery of exter outcomes. Show strong analytical and or any or analytical and or any or any or any or any of a miliar and unfamiliar situation organizational and presentational skills.  Demonstrate substantial command of a the course learning outcomes. Show evi apply knowledge to familiar and some ur	n of mathematics and stantific problems. to re-formulate both attions.  taking a Science major year.)  sive knowledge and skills retitical abilities and logical think as. Carry out computations coroad range of knowledge and dence of analytical and critical attentions. Cary out an amand of knowledge and skills retitions. Cary out an amand of knowledge and skills remained to the skills remai	equired for attaining all and scient examination  Examination  Equired for attaining all and ability to apply arefully and correctly. A deciring and abilities and logical to computations mostly in inizational and presenta	Dec May  the course learning knowledge to a wide Apply highly effective thining at least most of hinking, and ability to a careful and correct tional skills.  g most of the course g, and ability to apply	
(and Co-requisites and Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade	3. Identify 4. Apply mathema NIL (This cou Students Y 1st Y A+ to F  A  B	the mathematics that underlies scie logical and quantitative reasoning tical terms, and to interpret their solutions is compulsory for all students should take this course in their first years and sem.  Demonstrate thorough mastery of extendituce of familiar and unfamiliar situation organizational and presentational skills.  Demonstrate substantial command of a title course learning outcomes. Show evidence of solutions and presentational skills.  Demonstrate substantial command of a title course learning outcomes. Show evidence of solutions to the course general but incomplete corlearning outcomes. Show evidence of solutions to the course general but incomplete corlearning outcomes. Show evidence of solutions to the course general but incomplete corlearning outcomes. Show evidence of solutions to the course general but incomplete corlearning situations. Co	n of mathematics and stintific problems. to re-formulate both itions.  taking a Science major (rear.)  sive knowledge and skills retained abilities and logical think is. Carry out computations coroad range of knowledge and critical abilities and logical think is. Carry out computations coroad range of knowledge and critical familiar situations. Carry out all errors. Apply effective organmand of knowledge and critical ability me analytical and critical ability me analytical and critical ability me analytical and skills requerent and logical thinking, but to solve problems. Commit s	Examination  Examination  Equired for attaining all sing, and ability to apply arefully and correctly. It is a shall be a	Dec May  the course learning knowledge to a wide Apply highly effective tining at least most of hinking, and ability to a careful and correct tional skills.  g most of the course g, and ability to apply moderately effective of the course learning and critical abilities.	
(and Co-requisites and Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade	3. Identify 4. Apply mathema  NIL  (This council Students  Y 1st  Y  A+ to F  A  B	the mathematics that underlies scie logical and quantitative reasoning tical terms, and to interpret their solutions is compulsory for all students should take this course in their first years and sem.  Demonstrate thorough mastery of extenditures of familiar and unfamiliar situation organizational and presentational skills.  Demonstrate substantial command of a the course learning outcomes. Show evidence of so knowledge to familiar and some urway, but commit some minor computation.  Demonstrate general but incomplete corderning outcomes. Show evidence of so knowledge to most familiar situations. Corganizational and presentational skills.  Demonstrate partial but limited command outcomes. Show evidence of some coheshow limited ability to apply knowledge.	n of mathematics and stantific problems. to re-formulate both attions.  taking a Science major (year.)  taking and logical think is. Carry out computations corroad range of knowledge and critical abil or (year.)  taking and thinking and thinking but to solve problems (year.)  of knowledge and skills requernt and logical thinking, but to solve problems (year.)  namand of knowledge and skills in mand of knowledge and skills.	real life and scier  offered by the Fa  Examination  equired for attaining all ing, and ability to apply arefully and correctly. In a still it is a subject of a still it is and logical to computations mostly in inizational and presentary it is required for attaining the subject of a still in a still in a subject of a subject of a	Dec May  The course learning knowledge to a wide Apply highly effective a reful and correct tional skills.  If the course learning and ability to a careful and correct tional skills.  If the course learning and critical abilities and critical abilities. Itational errors. Apply the course learning and critical abilities are trained as the course learning and critical abilities. Itational errors. Apply the course learning and critical abilities.	
(and Co-requisites and impermissible combination)  Offer in 2014 - 2015  Offer in 2015 - 2016  Course Grade  Grade Descriptors	3. Identify 4. Apply mathema NIL (This council Students Y 1st Y A+ to F  A  B  C	the mathematics that underlies scie logical and quantitative reasoning tical terms, and to interpret their solutions and to interpret their solutions is should take this course in their first years and sem.  Demonstrate thorough mastery of extenditure outcomes. Show strong analytical and critange of familiar and unfamiliar situation organizational and presentational skills.  Demonstrate substantial command of a business of the course learning outcomes. Show eviapply knowledge to familiar and some unway, but commit some minor computation. Demonstrate general but incomplete corderaning outcomes. Show evidence of so knowledge to most familiar situations. Corganizational and presentational skills.  Demonstrate partial but limited command outcomes. Show evidence of some coheshow limited ability to apply knowledge limited or barely effective organizational and Demonstrate little or no evidence of conductomes. Lack of analytical and critical a knowledge to solve problems. Commit	n of mathematics and stantific problems. to re-formulate both attions.  taking a Science major (year.)  taking and logical think is. Carry out computations corroad range of knowledge and critical abil or (year.)  taking and thinking and thinking but to solve problems (year.)  of knowledge and skills requernt and logical thinking, but to solve problems (year.)  namand of knowledge and skills in mand of knowledge and skills.	real life and scier  offered by the Fa  Examination  equired for attaining all ing, and ability to apply arefully and correctly. In a still it is a subject of a still it is and logical to computations mostly in inizational and presentary it is required for attaining the subject of a still in a still in a subject of a subject of a	Dec May  The course learning knowledge to a wide Apply highly effective a reful and correct tional skills.  If the course learning and ability to a careful and correct tional skills.  If the course learning and critical abilities and critical abilities. Itational errors. Apply the course learning and critical abilities are trained as the course learning and critical abilities. Itational errors. Apply the course learning and critical abilities.	
(and Co-requisites and impermissible combination)  Offer in 2014 - 2015  Offer in 2015 - 2016  Course Grade  Grade Descriptors  Course Type  Course Teaching	3. Identify 4. Apply mathema NIL (This council Students Y 1st Y A+ to F  A  B  C	the mathematics that underlies scie logical and quantitative reasoning tical terms, and to interpret their solutions and to interpret their solutions is should take this course in their first years and sem.  Demonstrate thorough mastery of extending outcomes. Show strong analytical and critange of familiar and unfamiliar situation organizational and presentational skills.  Demonstrate substantial command of a bithe course learning outcomes. Show evidence of so knowledge to familiar and some unway, but commit some minor computation.  Demonstrate general but incomplete confearning outcomes. Show evidence of so knowledge to most familiar situations. Octorganizational and presentational skills.  Demonstrate partial but limited command outcomes. Show evidence of some coheshow limited ability to apply knowledge limited or barely effective organizational and Demonstrate little or no evidence of confuctomes. Lack of analytical and critical knowledge to solve problems. Commit minimally effective or ineffective.	n of mathematics and stantific problems. to re-formulate both attions.  taking a Science major (year.)  taking and logical think is. Carry out computations corroad range of knowledge and critical abil or (year.)  taking and thinking and thinking but to solve problems (year.)  of knowledge and skills requernt and logical thinking, but to solve problems (year.)  namand of knowledge and skills in mand of knowledge and skills.	real life and scier  offered by the Fa  Examination  equired for attaining all ing, and ability to apply arefully and correctly. In a still it is a subject of a still it is and logical to computations mostly in inizational and presentary it is required for attaining the subject of a still in a still in a subject of a subject of a	Dec May  The course learning knowledge to a wide Apply highly effective a reful and correct tional skills.  If the course learning and ability to a careful and correct tional skills.  If the course learning and critical abilities and critical abilities. Itational errors. Apply the course learning and critical abilities are trained as the course learning and critical abilities. Itational errors. Apply the course learning and critical abilities are trained as the course learning and critical abilities.	
(and Co-requisites and impermissible combination)  Offer in 2014 - 2015  Offer in 2015 - 2016  Course Grade  Grade Descriptors  Course Type  Course Teaching	3. Identify 4. Apply mathema NIL (This council Students Y 1st Y A+ to F  A  B  C  D  Fail	Demonstrate thorough mastery of extensional stillar and controverse of familiar and undersided and presentational skills.  Demonstrate thorough mastery of extensional stillar and unfamiliar situation organizational and presentational skills.  Demonstrate substantial command of a the course learning outcomes. Show evidence of so knowledge to most familiar situations. Demonstrate general but incomplete cortearning outcomes. Show evidence of so knowledge to most familiar situations. Corganizational and presentational skills.  Demonstrate general but incomplete cortearning outcomes. Show evidence of so knowledge to most familiar situations. Corganizational and presentational skills.  Demonstrate partial but limited command outcomes. Show evidence of some cohe Show limited ability to apply knowledge limited or barely effective organizational and Demonstrate little or no evidence of conductomes. Lack of analytical and critical a knowledge to solve problems. Commit minimally effective or ineffective.	n of mathematics and stintific problems. to re-formulate both itions.  taking a Science major (rear.)  sive knowledge and skills retitical abilities and logical think is. Carry out computations coroad range of knowledge and content and an anity it is a still a s	real life and scier  offered by the Fa  Examination  equired for attaining all ing, and ability to apply arefully and correctly. In a still it is a subject of a still it is and logical to computations mostly in inizational and presentary it is required for attaining the subject of a still in a still in a subject of a subject of a	Dec May  The course learning knowledge to a wide Apply highly effective an ability to a careful and correct tional skills. If and ability to a poly moderately effective of the course g, and ability to apply moderately effective of the course learning and critical abilities. Itational errors. Apply g the course learning a or no ability to apply sentational skills are	
(and Co-requisites and Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade	3. Identify 4. Apply mathema NIL (This country of 1st) Y 1st Y A+ to F  A B C D Fail Lecture-b Activitie	Demonstrate thorough mastery of extensional togical and quantitative reasoning tical terms, and to interpret their solutors is should take this course in their first years and seem and to interpret their solutors in their first years and to interpret their solutors in their first years and to interpret their solutors in their first years and take this course in their first years and their firs	n of mathematics and stintific problems. to re-formulate both itions.  taking a Science major (rear.)  sive knowledge and skills retitical abilities and logical think is. Carry out computations coroad range of knowledge and content and an anity it is a still a s	real life and scier  offered by the Fa  Examination  equired for attaining all ing, and ability to apply arefully and correctly. In a still it is a subject of a still it is and logical to computations mostly in inizational and presentary it is required for attaining the subject of a still in a still in a subject of a subject of a	Dec May  The course learning knowledge to a wide Apply highly effective bining at least most of hinking, and ability to a careful and correct tional skills.  If the course learning and ability to a poly moderately effective of the course learning and critical abilities. Itational errors. Apply go the course learning or no ability to apply sentational skills are	
(and Co-requisites and Impermissible combination)  Offer in 2014 - 2015  Offer in 2015 - 2016  Course Grade  Grade Descriptors  Course Type  Course Teaching	3. Identify 4. Apply mathema NIL (This council Students Y 1st Y A+ to F  A B C D Fail  Lecture-b Activitie Lectures Tutorials	Demonstrate thorough mastery of extensional togical and quantitative reasoning tical terms, and to interpret their solutors is should take this course in their first years and seem and to interpret their solutors in their first years and to interpret their solutors in their first years and to interpret their solutors in their first years and take this course in their first years and their firs	n of mathematics and stintific problems. to re-formulate both itions.  taking a Science major (rear.)  sive knowledge and skills retitical abilities and logical think is. Carry out computations coroad range of knowledge and content and an anity it is a still a s	real life and scier  offered by the Fa  Examination  equired for attaining all ing, and ability to apply arefully and correctly. In a still it is a subject of a still it is and logical to computations mostly in inizational and presentary it is required for attaining the subject of a still in a still in a subject of a subject of a	Dec May  I the course learning knowledge to a wide Apply highly effective a careful and correct tional skills.  Ig most of the course g, and ability to apply moderately effective of the course learning and critical abilities. Apply and critical abilities. Apply sentational skills are  No. of Hours  No. of Hours	

and Weighting			course grade (%)
	Assignments		20
	Examination	2-hour examination	40
	Project reports		20
	Test		20
Required/recommended reading and online materials	TBC		

SCNC1112 Fundamentals	or modern	science (6 creaits)	Academic Year	2014		
Offering Department	Faculty		Quota			
Course Co-ordinator	Dr J C S P	un, Physics (jcspun@hku.hk)				
Teachers Involved	Prof A S C Prof A S T Dr J S C L	un (2nd sem), Physics Cheung (1st & 2nd sem), Chemistry Wong (1st sem), Biological Sciences eung (2nd sem), Faculty e (1st sem), Earth Sciences				
Course Objectives	science. T sciences, oused in va- fundament	se aims to provide students an overview of the giant his course adopts an integrated approach and encochemistry, and biology, and focuses on the general princarious disciplines to describe the diverse phenomena all laws of each discipline, the historical developments of different science disciplines will be introduced.	empasses physics, a siples and unifying co and objects in the na s and the modern for	astronomy, earth ncepts of scienc atural world. The		
Course Contents & Topics	(2) Fundar - Structure - The quar - Elementa (3) Atoms - Matters a - Chemical - Importan - Nanoscie (4) DNA/6 - Molecule - Genomic (5) Cells a (6) Organis - The origi - Ecology a (7) Earth a - Solid Ear - Earth's m	and molecules and atoms: The periodic table bonds and chemical reactions molecules: water, carbon, molecular cluster and anotechnology enetic s of life s and DNA; Genetics and inheritance and systems am and environment and evolution of life and environment and Beyond th, Earth's atmosphere and hydrosphere otion in space he Sun, and the solar system				
Course Learning Outcomes	Acquire scientific ir 2. Underst 3. Apprecinterdiscipl 4. Critically 5. Develop	sful completion of this course, students should be able to: an understanding of the historical development of mode, quiry methods, and the role of science in the advanceme and and be familiar with the fundamental scientific princip ciate the diversity of different scientific disciplines inary perspectives on scientific issues. If and creatively appraise received ideas and established to curiosity in science and an appreciation of sciences as of life-long learning.	ern science, the essont of civilization over les and concepts. and develop multi- knowledge.	time. disciplinary and		
Pre-requisites and Co-requisites and mpermissible combination)		se is compulsory for all students taking a Science maj	or offered by the Fa	culty of Science		
Offer in 2014 - 2015		hould take this course in their first year.) sem 2nd sem	Examination	Dec May		
Offer in 2015 - 2016	Υ Υ		=24.IIII4IOII	DOG WAY		
Course Grade	A+ to F					
		<u></u>				
Grade Descriptors	В	outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective lab skills and techniques. Critical use of data and results to draw appropriate and insightful conclusions Apply highly effective organizational and presentational skills.				
	data of results to draw appropriate conclusions. 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 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	outcomes. Show evidence of some c Show limited ability to apply knowledge	nd of knowledge and skills required for attain oherent and logical thinking, but with limited to solve problems. Apply partially effective la appropriate conclusions. Apply limited or bar	analytical and critical abilities.  ab skills and techniques. Limited
	Fail	outcomes. Lack of analytical and critical knowledge to solve problems. Apply m	command of knowledge and skills required for al abilities, logical and coherent thinking. Show inimally effective or ineffective lab / fieldwork appropriate conclusions. Organization and pro-	w very little or no ability to apply skills and techniques. Misuse of
Course Type	Lecture w	rith laboratory component course		
Course Teaching	Activitie	s	Details	No. of Hours
& Learning Activities	Lectures			36
	Laboratory			2
	Tutorials			12
	Reading / Self study			94
	Assessment		1 hour in-class quiz	1
Assessment Methods and Weighting	Methods	<b>3</b>	Details	Weighting in final course grade (%)
	Assignments		tutorials and homework	20
	Examination			50
	Presenta	ition	project presentation	20
	Test			10
Required/recommended reading and online materials	Reference Biology: Benjamin	es: Integrated Science by Tillery, E	h by Trefil & Hazen 7th Edition (2013 inger, & Ross 5th Edition (2011, McC oy Campbell, Mitchell, & Reeco ndahl & Zumdahl (2012 Cengage)	GrawHill)

SCNC2121 Sustainable for	od production (6 credits)	Academic Year	2014		
Offering Department	Faculty	Quota	32		
Course Co-ordinator	Dr H S El-Nezami, Biological Sciences (elnezami@hku.hk)				
Teachers Involved	Dr H S El-Nezami, Biological Sciences Dr DeLisa Lewis, UBC Faculty of Land and Food Systems				
Course Objectives	This course is designed to provide students with the opportunity to experience the inner-workings of a sustainable, campus farming operation, and to make connections between the ecosystems that nourish the thriving, urban communities surrounding the farm. Students will participate in plenary sessions with course instructors and guest lecturers from the UBC Faculty of Land and Food Systems, in guided group discussions, field trips on and off-campus, and in a variety of seasonal, hands-on farming activities.				
Course Contents & Topics	The MacMillan building, home of the UBC Faculty of Land plenary sessions, guest speaker lectures, and morning group in UBC is the site of the majority of farming activities, inc Fridays and market Saturdays. Students will have a chance spots, including the LFS orchard garden, the world-class Cll innovative campus chef, Steve Golieb, and the wiggle worn Students will also venture off-campus to two the Vancouver Market to provide a comparative view of marketing system context.  The main approach to learning with this course is student-ce meet course learning objectives, students are expected to contribute to group discussions and the group oral present journals on each of the four main course themes-soils, biodive	discussion sessions. The luding afternoon group di to explore the UBC campu. RS green building, Place on project in the Student Usarmers' Market and to Grass and the regionally grountered learning and hands to attend and participate attend, and to complete a	south campus farm scussions, harvest is sustainability ho /anier, home of ar nion Building/SUB anville Island Public nded food system -on experience. To n all sessions, to		
Course Learning Outcomes	On successful completion of this course, students should be a second complete to the course, students should be a second compared to the course of sustainable farming.  2. Observe and compare multiple models of agricultural for setting.  3. Identify multiple strategies for creating on-farm biodiversity 4. Demonstrate a basic understanding of composting fundam 5. Demonstrate the ability to perform a select set of basic packing techniques in a sustainable campus farm setting.  6. Demonstrate best practices with post-harvest handling and	science fundamentals wood production in an urban entals.	and campus farm		
Pre-requisites (and Co-requisites and Impermissible combination)	Students are expected to have passed at least 30 credits Students will also need to pass an interview in order to be en		science courses.		
Offer in 2014 - 2015	Y Summer	Examination	No Exam		
Offer in 2015 - 2016	Υ				

Course Grade	A+ to F					
Grade Descriptors	A Clear understanding of the basics from sustainable farming to marketing strategies used by sustainable farming operations. Ability to perform crop maintenance, harvest, washing, and packing in a sustainable campus farm setting. Ability to demonstrate solid team-based skills for performance of fieldwork, and distinct performance in different assessment components. Ability to synthesize the lessons learned during the course and articulate individual learning objectives for further studies in agriculture, food and human health.					
	B Clear understanding of the basics from sustainable farming to marketing strategies used by sustainable farming operations. Ability to perform crop maintenance, harvest, washing, and packing in a sustainable campus farm setting. Ability to demonstrate solid team-based skills for performance of fieldwork, and distinct performance in different assessment components.					
	С	Understanding of the basics from sustainable farming to marketing strategies used by sustainable farming operations. Ability to perform crop maintenance, harvest, washing, and packing in a sustainable campus farm setting. Satisfactory demonstration of team-based skills for performance of fieldwork, and satisfactory performance in different assessment components.				
	D	Knowing some of the basics of sustainable farming. Active participation in team-based fieldwork, and satisfactory performance in different assessment components.				
	Fail	Fail to follow the basics of sustainable farm and/or fieldwork.	ning as demonstrated by unsatisfactory perfe	ormance in assignments		
Course Type	Field camp	os .				
Course Teaching & Learning Activities	Activities	·	Details	No. of Hours		
& Learning Activities	Lectures			20		
	Field work			50		
	Presentation		Group discussion / Project	10		
	Reading /	Self study		50		
	Assessment		End of trip report	30		
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)		
	Assignments		To be announced by UBC Faculty of Land and Food Systems	40		
	Report		The end of trip report should be 7-10 pages (not including the references). Please refer to Remarks for format requirements.	60		
Required/recommended reading and online materials	UBC Facul	lty of Land and Food Systems will give	reading materials to students.			
Course Website	http://www	.scifac.hku.hk/news/bsc/ubc-summer-c	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.					
	Remarks: The end of trip report should be 7-10 pages (not including the references). Please use Times New Roman (12 points), single space and 2 cm margins from all sides. The report can cover any of the areas discussed during the course. The marking criteria are the scientific quality (free from scientific jargon, well referenced, use of tables or figures to summarize important data, a conclusion section that contains own views and ideas in relation to the topic discussed in the report, and be free from typographical errors).					

SCINGZ 122 Warnie lile Sci	ence: a North East Pacific perspective (6 credits)	Academic Year	2014	
Offering Department	Faculty	Quota	32	
Course Co-ordinator	Dr T Vengatesen, Biological Sciences (rajan@hku.hk)			
Teachers Involved	Dr T Vengatesen, Biological Sciences Prof S Kwok, Faculty of Science Prof R S S Wu, Biological Sciences			
Course Objectives	Marine Life Science is an integrated study of how the oceans marine biology through biophysical interactions. By studying the Ocean, students will learn marine habitats as habitable plan biodiversity, the complex interactions between the physical ar services the coastal oceans provide to human. This course students to experience the diversity of marine life on the other s	ne temperate cold wate let, to appreciate the cond biological componer will provide an excell	rs of the NE Pacific lynamics of marine ts, fishery, and the	
Course Contents & Topics	Lectures from both HKU and UBC teachers will introduce 'marin	na lifa nainmanlı with a fe		

	coastal hatechniques a different students, b	nere will also be several opportunitie abitats, sandy beaches and estuaries and methods of studying marine life in learning environment involving not onloringing diverse range of expertise, clean to focus on the diversity, dynamic	s in the Vancouver Island. Marine n the field will be emphasized. Stude ly HKU teachers and students but al ultures, and learning opportunities fr	e biodiversity survey nts will be exposed to so UBC teachers and om both sides of the	
Course Learning Outcomes	1. Underst	sful completion of this course, students and the basics of marine life science a the major types, causes, and effects	nd the marine habitable planet.	n overfishing global	
	warming a threats for 3. Describe 4. Discover	and ocean acidification, and invasive simulation and invasive simulation and ecosystem size the difference between coastal marine the reasons why marine biodiversity orth Pacific coastal ecosystems.	species, as well as describe the co ervices. le biodiversity and harbors in Hong K	nsequences of these ong and Canada.	
Pre-requisites (and Co-requisites and Impermissible combination)		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.			
Offer in 2014 - 2015	Y Sum	nmer	Examination	Summer	
Offer in 2015 - 2016	Υ			'	
Course Grade	A+ to F				
Grade Descriptors	A Demonstrate through knowledge in basics of marine science and clearly understand why an biodiversity in sub-tropical Hong Kong is different from the North Pacific coastal areas. Ability to expl organisms have adapted to their particular environments. Showing strong abilities, and logical thinking of original thought, to examine reasons why the diversity of marine life and their habitats are so imposociety. Independent critique on how human induced threats such as climate change, pollution and will affect marine life, its diversity and their ecosystem services.				
	В	Clear understanding of the basics of marine science. Ability to explain how marine organisms have adapted to their particular environments. Knowing the common views on the reasons why the diversity of marine life and their habitats are so important to human society. Knowing the common views on how human induced threats such as climate change, pollution and habitat change will affect marine life, its diversity and their ecosystem services.			
	C Demonstrate partial and limited command of knowledge and understanding of the basics of marine science, biodiversity and coastal ecosystem services. Develop little ability to explain how marine organisms have adapted to their particular environments. Knowing the common views on the reasons why the diversity of marine life and their habitats are so important to human society. Knowing the common views on how human induced threats such as climate change, pollution and habitat change will affect marine life, its diversity and their ecosystem services.				
	<b>D</b> Knowing some of the basics of marine science. Developing ability to explain how marine organisms have adapted to their particular environments.				
	Fail	Fail to follow the basics of marine science environments.	ce and/or how marine organisms have ad	apted to their particular	
Course Type	Field camp	os			
Course Teaching	Activities	<b>;</b>	Details	No. of Hours	
& Learning Activities	Lectures		10 sessions x 2.5 hours	25	
	Field work	(	Field observation and work: about 5 to 6 field study	36	
	Presentat	ion	Group discussion / Project: 1 group project with presentation	10	
	Reading /	Self study		70	
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	
	Assignme	ents	Group project work (30-mins presentation)	25	
	Report		2-hour written examination	50	
	Test		Field observation (group activities & reports)	25	
Required/recommended reading and online materials	Reference	reading materials will be put on Mood	le.		
Course Website	http://www	.scifac.hku.hk/news/bsc/ubc-summer-o	course		
Additional Course Information	institution ( This cours Enrolment	te: Students have to cover their own (prices to be announced). e will be offered subject to a minimum of this course is not conducted via the by the Faculty after approval has been	enrollment number and availability o	f teachers. Idents will be enrolled	

STAT1600 Statistics: ideas	AT1600 Statistics: ideas and concepts (6 credits)			demic Year	2014	
Offering Department	Statistics &	Actuarial Science	Quo	ota		
Course Co-ordinator	Prof W K L	i, Statistics & Actuarial Science (hrntlw	k@hku.hk)			
Teachers Involved	Dr Y K Chu Dr K P Wat	, Statistics & Actuarial Science ing, Statistics & Actuarial Science r, Statistics & Actuarial Science r, Statistics & Actuarial Science				
Course Objectives	Risk Mana spectrum o	The course aims at providing a broad overview of statistics for students who aspire to major in Statistics or Risk Management. It focuses on the roles of statistics as a scientific tool with applications to a wide spectrum of disciplines, and as a science of reasoning which has revolutionized modern intellectual endeavours. It lays a panoramic foundation for a formal study of statistics at the university level.				
Course Contents & Topics	<ul><li>Data pres</li><li>Probabilit</li><li>Inference</li></ul>	<ul> <li>Data collection: observational studies versus designed experiments</li> <li>Data presentation: tables; graphs; frequency distributions; correlations; trends</li> <li>Probability: randomness; probability models; distributions; measures of central tendency and dispersion</li> <li>Inference: estimation; tests of significance and hypotheses; confidence intervals; regression; prediction</li> <li>Further issues: controversies; misuse of statistics; ethics.</li> </ul>				
Course Learning Outcomes	<ol> <li>Understa</li> <li>Present</li> <li>Acquire</li> <li>Distingui</li> </ol>	On successful completion of this course, students should be able to: 1. Understand the role of statistics as a tool for scientific reasoning. 2. Present data in a useful and informative way. 3. Acquire basic concepts and perspectives of statistical modelling and inference. 4. Distinguish between good and bad statistical practices. 5. Pursue a major study in Statistics or Risk Management with a well-established conceptual foundation.				
Pre-requisites (and Co-requisites and Impermissible combination)	NIL					
Offer in 2014 - 2015	Y 1st s	em 2nd sem	Exa	mination	Dec May	
Offer in 2015 - 2016	Υ					
Course Grade	A+ to F					
Grade Descriptors	В	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.				
		the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.				
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.				
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational arpresentational skills.			and critical abilities.	
	Fail	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	sed course				
Course Teaching	Activities		Details		No. of Hours	
& Learning Activities	Lectures				36	
	Tutorials				12	
	Reading /	Self study			100	
Assessment Methods and Weighting	Methods		Details		Veighting in final course grade (%)	
	Assignments		Coursework (assignmentest(s) and project(s))	nts, class	60	
	Examination	on	One 2-hour written exam	mination	40	
Required/recommended reading and online materials	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 Microsoft Excel. Cengage Learning. Moore, D. S. and Notz, W. I. (2006). Statistics: Concepts and Controversies. Freeman: New York.					
Course Website	moodle.hku					

STAT1601 Elementary statistical methods (6 credits)		Academic Year	2014			
Offering Department	Statistics & Actuarial Science					
Course Co-ordinator	Mrs G M Jing, Statistics & Actuarial Science (gmjing @saas.hku.hk)					
Teachers Involved	Mrs G M Jing, Statistics & Actuarial Science	Mrs G M Jing, Statistics & 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					

	data are the statistical n	uantity or to test the acceptability of a nus essential to any successful investi nethods widely used by researchers. N here is no demand of sophisticated tec	gation. The course aims to presen dicrosoft Excel might be used to car	t the fundamentals of	
Course Contents & Topics	The course will introduce and study the following topics: Presentation of data, Measures of Central Tendency, Measures of Variability and Uncertainty, Basic 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	1. Select a 2. Perform 3. Understa 4. Gain fan 5. Make inf 6. Determir 7. Write ap 8. Underst	On successful completion of this course, students should be able to:  1. Select and use appropriate statistical methods to analyze data.  2. Perform statistical analysis with calculator and Microsoft Excel.  3. Understand and apply basic concepts of probability.  4. Gain familiarity with the fundamental concepts of random variables.  5. Make inferences on a population based on sample data.  6. Determine the most appropriate statistical method to use for a given statistical problem.  7. Write appropriate conclusions based on the statistical results.  8. Understand the basic principles of simple linear regression and correlation and their applications to practical problems.			
Pre-requisites (and Co-requisites and Impermissible combination)	Not for stud Not for stu Probability	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			
Offer in 2014 - 2015	Y 1st s	Y 1st sem 2nd sem Examination		Dec May	
Offer in 2015 - 2016	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.				
	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 k outcomes. Show evidence of some coheren Show limited ability to apply knowledge to presentational skills.	t and logical thinking, but with limited analy	tical and critical abilities.	
	Fail	Demonstrate little or no evidence of comma outcomes. Lack of analytical and critical abilit knowledge to solve problems. Organization ar	ies, logical and coherent thinking. Show very	little or no ability to apply	
Course Type	Lecture-ba	sed course			
Course Teaching	Activities		Details	No. of Hours	
& Learning Activities	Lectures			36	
	Tutorials			12	
	Reading /	Self study		100	
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	
	Assignme	nts	Coursework (assignments, tutorials, and a class test)	25	
	Examinati	on	One 2-hour written examination	75	
Required/recommended reading and online materials	Larson, R. Berk, K.N.	Chiu W. K.: Basic Statistics (Pearson (Asia), 2007) Larson, R. & Farber, B.: Elementary Statistics, Picturing the World (Prentice Hall, 2008, 4th ed.) Berk, K.N. & Carey, P.: Data Analysis with Microsoft EXCEL (Duxbury press, Update Office 2007) Freund, J. E. & Perles, B. M.: Statistics - A First Course (Prentice Hall, 2004, 8th ed.)			
Course Website	moodle.hku	u.hk			
Additional Course Information		CASIO fx-50FH (This model has SD-Nery suitable for this course.)	MODE, REG-MODE, nCr and Norma	al Probability Function	

STAT1602 Business st	Academic Year	2014				
Offering Department	Statistics & Actuarial Science Quota					
Course Co-ordinator	Dr R W L Wong, Statistics & Actuarial Science (rwong@hku.hk)	Dr R W L Wong, Statistics & Actuarial Science (rwong@hku.hk)				
Teachers Involved	Dr R W L Wong, Statistics & Actuarial Science	Dr R W L Wong, Statistics & Actuarial Science				
Course Objectives	The discipline of statistics is concerned with situations involving uncertainty and variability. Variability greatly affects the interpretation of data. Thus statistics forms an important descriptive and analytical tool. This elementary course, which is taught without much technical mathematics, presents many					

Course Website	moodle.hk	u.hk			
Required/recommended reading and online materials	Gerald Keller: Managerial Statistics (Cengage Learning, 2009, 8th edition) Freund, J. E. & Perles, B. M.: Modern Elementary Statistics (Prentice Hall, 2006, 12th ed.) 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.)				
	Examinati	on	One 2-hour written exa	,	75
-	Assignments		Coursework (assig tutorials, and a class to	nments,	25
Assessment Methods and Weighting	Methods		Details		Veighting in final course grade (%)
	Reading /	Self study			100
	Tutorials				12
& Learning Activities	Lectures				36
Course Teaching	Activities		Details		No. of Hours
Course Type	Lecture-ba	sed course			
	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.			
	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.			
	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.			
	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.			
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.				
Course Grade	A+ to F				
Offer in 2015 - 2016	Υ				
Offer in 2014 - 2015	Y 1st s	sem 2nd sem	E	kamination	Dec May
Pre-requisites and Co-requisites and mpermissible combination)	Elementary STAT2901 data	udents who have passed or alrea y statistical methods, STAT2601 Pr Probability and statistics: foundations se is exclusive for School of Busines	robability and statistics I, sons of actuarial science, E	STAT1603 Intro	ductory statistics
	3. Draw co 4. Underst 5. Gain fan 6. Make in 7. Determi 8. Gain fa problems. 9. Underst practical pr	nclusions from data using numerical and and apply basic concepts of pro niliarity with the fundamental concepterences on a population based on she the most appropriate statistical miliarity with the fundamental concand the basic principles of simple roblems in today's society.	summaries. bability. ts of random variables. eample data. ethod to use for a given st bepts of statistical inferen	ce as they app	ly to a variety of
Course Learning Outcomes	1. Understa	On successful completion of this course, students should be able to:  1. Understand the methods for describing sets of data.  2. Perform statistical analysis with calculator and Microsoft Excel.			
Course Contents & Topics	The course will introduce and discuss the following topics: Presentation of Data, Measures of Central Tendency, Measures of Variability and Uncertainty, Elementary Probability Rules and Basic Probability Distributions such as Binomial, Normal, Poisson, Hyper-geometric and Geometric, Random Sampling, the Normal Sampling Theorem, Point Estimation, Confidence Intervals and Sample Size Determination, Hypothesis Testing involving Inferences for Means and Proportions as well as the Chi-square tests, Simple Regression and Correlation, Elementary Time Series and Index Numbers				
	statistical statistical a	•	ented. Microsoft Excel mi	ght be used to	carry out some

STAT1603 Introductory statistics (6 credits)		Academic Year	2014		
Offering Department	Statistics & Actuarial Science	Quota			
Course Co-ordinator	Dr E K F Lam, Statistics & Actuarial Science (hrntlkf@hku.hk)				
Teachers Involved	Dr E K F Lam, Statistics & Actuarial Science				
Course Objectives	The discipline of statistics is concerned with situations involving uncertainty and variability. The interpretation of data needs special techniques when variability plays a role, as it usually does. Thus				

	a mathema	statistics forms an important descriptive and analytical tool of many scientific disciplines. Candidates with a mathematical background will find this course suitable, because the language of mathematics allows the subject of statistics to be presented with economy and clarity.				
Course Contents & Topics	Basic Pro Samples,	resentation of data, Variability and Uncertainty, Measures of Central Tendency, Measures of Dispersion, asic Probability Theory and Techniques, Random Variables and Probability Distributions, Random amples, Point Estimation, Normal Sampling Theorem, Confidence Intervals, Hypotheses Testing, Simple inear Regression and Correlation.				
Course Learning Outcomes	On succes	ssful completion of this course, student	s should be able to:			
	2. Make us 3. Know h population 4. Use line	1. Compute different measures of central tendency and dispersion. 2. Make use of the basic probability theory and techniques to solve practical problem. 3. Know how to construct confidence intervals and use hypotheses testing to carry out inference on the copulation. 4. Use linear regression and correlation methods to solve problems in science and in social and business environment.				
Pre-requisites (and Co-requisites and Impermissible combination)	(Pass in M Not for stu STAT1601	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 lot for students who have passed or already enrolled in any of these courses: ITAT1601 Elementary statistical methods, STAT1602 Business statistics, STAT2601 Probability and tatistics I, STAT2901 Probability and statistics: foundations of actuarial science				
Offer in 2014 - 2015	Y 1st	sem	Examinat	ion	Dec	
Offer in 2015 - 2016	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 commoutcomes. Lack of analytical and critical abil knowledge to solve problems. Organization a	ities, logical and coherent thinking. Show	very little	or no ability to apply	
Course Type	Lecture-ba	ased course				
Course Teaching	Activities	<b>S</b>	Details		No. of Hours	
& Learning Activities	Lectures				36	
	Tutorials				12	
	Reading /	Self study			100	
Assessment Methods and Weighting	Methods		Details		eighting in final ourse grade (%)	
	Assignme	ents	Coursework (assignments, tutorials, and a class test)		25	
	Examinat	ion	One 2-hour written examination	n	75	
Required/recommended reading and online materials	Miller, I. and Miller, M.: John E. Freund's Mathematical Statistics with Applications (Prentice Hall, New Jersey, 2004, 7th edition) Larson, R. and Farber, B.: Elementary Statistics - Picturing the World (Prentice Hall, 2006, 3rd edition) Bluman, A. G.: Elementary Statistics - A Step by Step Approach (The McGraw-Hill Companies, Inc., 2004, 5th edition) Triola, M. F.: Elementary Statistics (Addiso Wesley Longman, Inc., 1998, 7th edition)					
Course Website	moodle.hk	u.hk				
Additional Course Information	course. Other refe Wonnacot	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)				

STAT2601 Probability a	Academic Year	2014				
Offering Department	Statistics & Actuarial Science Quota					
Course Co-ordinator	Dr Y K Chung, Statistics & Actuarial Science (yukchung@hku.hk)	Dr Y K Chung, Statistics & Actuarial Science (yukchung@hku.hk)				
Teachers Involved	Dr K P Wat (Course coordinator of 1st sem), Statistics & Actuarial Science Dr Y K Chung (Course coordinator of 2nd sem), Statistics & Actuarial Science					
Course Objectives	The discipline of statistics is concerned with situations in which uncertainty and variability play an essential role and forms an important descriptive and analytical tool in many practical problems. Against a					

		nd of motivating problems this course ertainty and variability.	e develops relevant probability mode	els for the description of	
Course Contents & Topics	Independe (pmf); Ber distribution Functions Functions	Sample spaces; Operations of events; Probability and probability laws; Conditional probability; Independence; Discrete random variables; Cumulative distribution function (cdf); Probability mass function (pmf); Bernoulli, binomial, geometric, and Poisson distributions; Continuous random variables; Cumulative distribution function (cdf); Probability density function (pdf); Exponential, Gamma, and normal distributions; Functions of a random variable; Joint distributions; Marginal distributions; Independent random variables; Functions of jointly distributed random variables; Expected value; Variance and standard deviation; Covariance and correlation.			
Course Learning Outcomes	On succes	ssful completion of this course, stude	ents should be able to:		
	2. Gain so 3. Solve re	tand the basic concepts in probability ome insights to statistics and inference eal-world problem by using probability their further studies in statistics.	ce.		
Pre-requisites (and Co-requisites and Impermissible combination)	students a Pass in M 2013 or bo Pass in M and statis Not for stu Not for stu or already	Pass in MATH2014 Multivariable calculus and linear algebra, or already enrolled in this course, 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.			
Offer in 2014 - 2015	Y 1st	sem 2nd sem	Examination	on Dec May	
Offer in 2015 - 2016	Y				
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.				
		apply knowledge to familiar and some unia			
	С	Demonstrate general but incomplete com learning outcomes. Show evidence of sor		al and presentational skills.  attaining most of the course thinking, and ability to apply	
	C	Demonstrate general but incomplete com learning outcomes. Show evidence of sor knowledge to most familiar situations. Appl Demonstrate partial but limited command outcomes. Show evidence of some cohe	amiliar situations. Apply effective organizations amand of knowledge and skills required for the analytical and critical abilities and logical	al and presentational skills.  attaining most of the course thinking, and ability to apply sentational skills.  some of the course learning halytical and critical abilities.	
		Demonstrate general but incomplete com learning outcomes. Show evidence of sor knowledge to most familiar situations. Appl Demonstrate partial but limited command outcomes. Show evidence of some cohe Show limited ability to apply knowledge presentational skills.  Demonstrate little or no evidence of com outcomes. Lack of analytical and critical ai	amiliar situations. Apply effective organizations mand of knowledge and skills required for me analytical and critical abilities and logical ly moderately effective organizational and pre of knowledge and skills required for attaining trent and logical thinking, but with limited ar	al and presentational skills.  attaining most of the course thinking, and ability to apply sentational skills.  some of the course learning halytical and critical abilities. effective organizational and  attaining the course learning ery little or no ability to apply	
Course Type	D Fail	Demonstrate general but incomplete com learning outcomes. Show evidence of sor knowledge to most familiar situations. Appl Demonstrate partial but limited command outcomes. Show evidence of some cohe Show limited ability to apply knowledge presentational skills.  Demonstrate little or no evidence of com outcomes. Lack of analytical and critical ai	amiliar situations. Apply effective organizations amand of knowledge and skills required for me analytical and critical abilities and logical ly moderately effective organizational and pre of knowledge and skills required for attaining rent and logical thinking, but with limited ar to solve problems. Apply limited or barely umand of knowledge and skills required for a bilities, logical and coherent thinking. Show	al and presentational skills.  attaining most of the course thinking, and ability to apply sentational skills.  some of the course learning halytical and critical abilities. effective organizational and  attaining the course learning ery little or no ability to apply	
Course Teaching	D Fail	Demonstrate general but incomplete com learning outcomes. Show evidence of sor knowledge to most familiar situations. Appl Demonstrate partial but limited command outcomes. Show evidence of some cohe Show limited ability to apply knowledge presentational skills.  Demonstrate little or no evidence of com outcomes. Lack of analytical and critical al knowledge to solve problems. Organization assed course	amiliar situations. Apply effective organizations amand of knowledge and skills required for me analytical and critical abilities and logical ly moderately effective organizational and pre of knowledge and skills required for attaining rent and logical thinking, but with limited ar to solve problems. Apply limited or barely umand of knowledge and skills required for a bilities, logical and coherent thinking. Show	al and presentational skills.  attaining most of the course thinking, and ability to apply sentational skills.  some of the course learning halytical and critical abilities. effective organizational and  attaining the course learning ery little or no ability to apply	
Course Teaching	D Fail	Demonstrate general but incomplete com learning outcomes. Show evidence of sor knowledge to most familiar situations. Appl Demonstrate partial but limited command outcomes. Show evidence of some cohe Show limited ability to apply knowledge presentational skills.  Demonstrate little or no evidence of com outcomes. Lack of analytical and critical al knowledge to solve problems. Organization assed course	amiliar situations. Apply effective organizations amand of knowledge and skills required for me analytical and critical abilities and logical ly moderately effective organizational and pre of knowledge and skills required for attaining rent and logical thinking, but with limited are to solve problems. Apply limited or barely mand of knowledge and skills required for a bilities, logical and coherent thinking. Show on and presentational skills are minimally effective.	al and presentational skills.  attaining most of the course thinking, and ability to apply isentational skills.  some of the course learning altylical and critical abilities.  effective organizational and attaining the course learning ery little or no ability to apply tive or ineffective.  No. of Hours	
Course Teaching	D Fail Lecture-ba	Demonstrate general but incomplete com learning outcomes. Show evidence of sor knowledge to most familiar situations. Appl Demonstrate partial but limited command outcomes. Show evidence of some cohe Show limited ability to apply knowledge presentational skills.  Demonstrate little or no evidence of com outcomes. Lack of analytical and critical al knowledge to solve problems. Organization assed course	amiliar situations. Apply effective organizations amand of knowledge and skills required for me analytical and critical abilities and logical ly moderately effective organizational and pre of knowledge and skills required for attaining rent and logical thinking, but with limited are to solve problems. Apply limited or barely mand of knowledge and skills required for a bilities, logical and coherent thinking. Show on and presentational skills are minimally effective.	al and presentational skills.  attaining most of the course thinking, and ability to apply sentational skills.  some of the course learning halytical and critical abilities. effective organizational and  attaining the course learning ery little or no ability to apply tive or ineffective.  No. of Hours  36	
Course Teaching	D Fail Lecture-ba Activities Lectures Tutorials	Demonstrate general but incomplete com learning outcomes. Show evidence of sor knowledge to most familiar situations. Appl Demonstrate partial but limited command outcomes. Show evidence of some cohe Show limited ability to apply knowledge presentational skills.  Demonstrate little or no evidence of com outcomes. Lack of analytical and critical al knowledge to solve problems. Organization assed course	amiliar situations. Apply effective organizations amand of knowledge and skills required for me analytical and critical abilities and logical ly moderately effective organizational and pre of knowledge and skills required for attaining rent and logical thinking, but with limited are to solve problems. Apply limited or barely mand of knowledge and skills required for a bilities, logical and coherent thinking. Show on and presentational skills are minimally effective.	al and presentational skills.  attaining most of the course thinking, and ability to apply sentational skills.  some of the course learning halytical and critical abilities. effective organizational and  attaining the course learning ery little or no ability to apply tive or ineffective.   No. of Hours  36  12	
Course Teaching & Learning Activities  Assessment Methods	D Fail Lecture-ba Activities Lectures Tutorials	Demonstrate general but incomplete com learning outcomes. Show evidence of sor knowledge to most familiar situations. Appl Demonstrate partial but limited command outcomes. Show evidence of some cohe Show limited ability to apply knowledge presentational skills.  Demonstrate little or no evidence of com outcomes. Lack of analytical and critical al knowledge to solve problems. Organization ased course	amiliar situations. Apply effective organizations amand of knowledge and skills required for me analytical and critical abilities and logical ly moderately effective organizational and pre of knowledge and skills required for attaining rent and logical thinking, but with limited are to solve problems. Apply limited or barely mand of knowledge and skills required for a bilities, logical and coherent thinking. Show on and presentational skills are minimally effective.	al and presentational skills.  attaining most of the course thinking, and ability to apply sentational skills.  some of the course learning halytical and critical abilities. effective organizational and  attaining the course learning ery little or no ability to apply tive or ineffective.  No. of Hours  36  12  100  Weighting in final	
Course Teaching & Learning Activities  Assessment Methods	D Fail Lecture-ba Activities Lectures Tutorials Reading	Demonstrate general but incomplete com learning outcomes. Show evidence of sor knowledge to most familiar situations. Appl Demonstrate partial but limited command outcomes. Show evidence of some cohe Show limited ability to apply knowledge presentational skills.  Demonstrate little or no evidence of com outcomes. Lack of analytical and critical at knowledge to solve problems. Organization ased course	amiliar situations. Apply effective organizations mand of knowledge and skills required for me analytical and critical abilities and logical ly moderately effective organizational and pre of knowledge and skills required for attaining rent and logical thinking, but with limited are to solve problems. Apply limited or barely mand of knowledge and skills required for a bilities, logical and coherent thinking. Show on and presentational skills are minimally effective.  Details	al and presentational skills.  attaining most of the course thinking, and ability to apply sentational skills.  some of the course learning halytical and critical abilities. effective organizational and  attaining the course learning ery little or no ability to apply tive or ineffective.  No. of Hours  36  12  100  Weighting in final course grade (%)	
Course Teaching & Learning Activities  Assessment Methods	D Fail Lecture-ba Activities Lectures Tutorials Reading Methods	Demonstrate general but incomplete com learning outcomes. Show evidence of sor knowledge to most familiar situations. Appl Demonstrate partial but limited command outcomes. Show evidence of some cohe Show limited ability to apply knowledge presentational skills.  Demonstrate little or no evidence of com outcomes. Lack of analytical and critical at knowledge to solve problems. Organization ased course	amiliar situations. Apply effective organizations mand of knowledge and skills required for me analytical and critical abilities and logical ly moderately effective organizational and pre of knowledge and skills required for attaining rent and logical thinking, but with limited are to solve problems. Apply limited or barely mand of knowledge and skills required for a bilities, logical and coherent thinking. Show on and presentational skills are minimally effective petails    Details   Details	al and presentational skills.  attaining most of the course thinking, and ability to apply sentational skills.  I some of the course learning halytical and critical abilities.  effective organizational and attaining the course learning ery little or no ability to apply tive or ineffective.  No. of Hours  36  12  100  Weighting in final course grade (%)	
Course Type Course Teaching & Learning Activities  Assessment Methods and Weighting  Required/recommended reading and online materials	D  Fail  Lecture-ba  Activities Lectures Tutorials Reading  Methods  Assignme Examinat  DeGroot, Sheldon, I Miller, I. a Prentice Hogg, R.\ Prentice H	Demonstrate general but incomplete com learning outcomes. Show evidence of sor knowledge to most familiar situations. Appl Demonstrate partial but limited command outcomes. Show evidence of some cohe Show limited ability to apply knowledge presentational skills.  Demonstrate little or no evidence of com outcomes. Lack of analytical and critical at knowledge to solve problems. Organization ased course	amiliar situations. Apply effective organizations around of knowledge and skills required for the analytical and critical abilities and logical ly moderately effective organizational and pre of knowledge and skills required for attaining the remaining of knowledge and skills required for attaining the remaining of knowledge and skills required for a to solve problems. Apply limited or barely around of knowledge and skills required for a bilities, logical and coherent thinking. Show on and presentational skills are minimally effect to a presentational skills are minimally effect to the problems.  Details  Details  Details  Coursework (assignments, tutorials, and class test(s))  One 2-hour written examination or and Statistics (Boston: Addison-Weiter Saddle River: Prentice Hall, 2010 thematical Statistics with Application introduction to Mathematical Statistics	al and presentational skills.  attaining most of the course thinking, and ability to apply sentational skills.  some of the course learning halytical and critical abilities. effective organizational and attaining the course learning ery little or no ability to apply tive or ineffective.  No. of Hours  No. of Hours  100  Weighting in final course grade (%)  25  25  25  28ley, 2012, 4th ed.)  18 (Upper Saddle River: es (Upper Saddle Riv	

STAT2602 Probability and statistics II (6 credits)		Academic Year	2014			
Offering Department	Statistics & Actuarial Science Quota					
Course Co-ordinator	Dr Y K Chung, Statistics & Actuarial Science (yukchung@h	Dr Y K Chung, Statistics & Actuarial Science (yukchung@hku.hk)				
Teachers Involved	Dr K S Chong, Statistics & Actuarial Science Dr Y K Chung, Statistics & Actuarial Science					
Course Objectives	This course builds on STAT2601, introducing further the concepts and methods of statistics. Emphasis is					

	statistical r	major areas of statistical analysis: est modelling, inference and decision mak ative perceptions essential for making r	ing, students will be equipped wi	th both quan	
Course Contents & Topics	<ol> <li>Overview: random sample; sampling distributions of statistics; moment generating function; large-sample theory: laws of large numbers and Central Limit Theorem; likelihood; sufficiency; factorisation criterion;</li> <li>Estimation: estimator; bias; mean squared error; standard error; consistency; Fisher information; Cramer-Rao Lower Bound; efficiency; method of moments; maximum likelihood estimator;</li> <li>Hypothesis testing: types of hypotheses; test statistics; p-value; size; power; likelihood ratio test; Neyman-Pearson Lemma; generalized likelihood ratio test; Pearson chi-squared test; Wald tests;</li> <li>Confidence interval: confidence level; confidence limits; equal-tailed interval; construction based on hypothesis tests.</li> </ol>				
Course Learning Outcomes	On successful completion of this course, students should be able to:  1. Apprehend the objectives of statistics and its relation to probability theory.  2. Relate a real-life problem to a formal framework for statistical inference.  3. Conduct standard parametric statistical inference by means of estimation and hypothesis testing.  4. Reckon the general applicability of statistics in a broad range of subject areas.				
Pre-requisites (and Co-requisites and Impermissible combination)		AT2601 Probability and statistics I			
Offer in 2014 - 2015	Y 1st s	1st sem 2nd sem Examination Dec			May
Offer in 2015 - 2016	Y	2114 00111	ZXXIIIIXXX	5.1.	, iviay
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				
	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-ba	sed course			
Course Teaching	Activities	•	Details	N	o. of Hours
& Learning Activities	Lectures				36
	Tutorials				12
	Reading /	Self study			100
Assessment Methods and Weighting	Methods		Details		ting in final e grade (%)
	Assignme	nts	Coursework (assignments, tutorials and a class test)		25
	Examinati	on	One 2-hour written examination	1	75
Required/recommended reading and online materials	Berry, D.A. & Lindgren, B.W. (1996). Statistics: Theory and Methods. Duxbury: Belmont. Bickel, P.J. & Doksum, K.A. (2001). Mathematical Statistics: Basic Ideas and Selected Topics. Prentice Hall: Upper Saddle River, N.J. Hogg, R.V. & Craig, A.T. (1989). Introduction to Mathematical Statistics. Macmillan: New York. Miller, I. & Miller, M. (2004). John E. Freund's Mathematical Statistics with Applications. Pearson Prentice Hall: Upper Saddle River.				
Course Website	moodle.hk	u.hk			

STAT2603 Data managem	TAT2603 Data management with SAS (6 credits)					
Offering Department	Statistics & Actuarial Science Quota					
Course Co-ordinator	Dr C W Kwan, Statistics & Actuarial Science (cwkwan@hku.hk)					
Teachers Involved	Dr G C S Lui (Course coordinator of 1st sem), Statistics & Actuarial Science Dr C W Kwan (Course coordinator of 2nd sem), Statistics & Actuarial Science					
Course Objectives	This course is designed for students who want to learn a statistical software (SAS) for data management and elementary data analysis. This course focuses on using SAS to manage data set input and output, work with different data types, manipulate and transform data, perform random sampling and descriptive data analysis, and create summary reports and graphics.					
Course Contents & Topics	Data management system for statistical projects. Data validation and cleaning techniques. SAS programming topics, including the following: Data set input and output. Working with different data					

		ata manipulation. Data transformation zation, presentation and graphics. Bas			
Course Learning Outcomes	On successful completion of this course, students should be able to:  1. Access online help and document. 2. Use Data Step to create data files. 3. Summarize data by PROC MEANS, PROC FREQ, and PROC UNIVARIATE. 4. Work with numeric, character, and date variables and functions in Data Step. 5. Perform conditional processing in Data Step. 6. Perform iterative processing in Data Step - work with arrays in Data step - restructure SAS data sets by Data Step and PROC TRANSPOSE - subset and merge data sets by Data Step and PROC APPEND - present data in a readable way by PROC TABULATE - produce high-resolution graphics by PROC SGPLOT - produce HTML output by ODS - procedure SQL for structured query language.				
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in S	TAT1600 Statistics: ideas and concept	s, or already enrolled in this course		
Offer in 2014 - 2015	Y 1st	1st sem 2nd sem Examination Dec			
Offer in 2015 - 2016	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	outcomes. Lack of analytical and critical abil	and of knowledge and skills required for atta lities, logical and coherent thinking. Show ven and presentational skills are minimally effective	/ little or no ability to apply	
Course Type	Lecture-b	ased course			
Course Teaching	Activitie	es .	Details	No. of Hours	
& Learning Activities	Lectures	;		36	
	Tutorials	i		12	
	Reading	/ Self study		100	
Assessment Methods and Weighting	Methods	S	Details	Weighting in final course grade (%)	
	Assignments		Coursework (assignments, tutorials, and class test(s))	40	
	Examina	ation	One 2-hour written examination	60	
Required/recommended reading and online materials	Cody, R.P.: Learning SAS by Example: A Programmer's Guide (North Carolina: SAS Institute Inc., 2007) SAS: SAS Certification Prep Guide: Base Programming for SAS 9. Third Edition. (SAS Institute Inc., 2011) Bailer, J.: Statistical Programming in SAS. North Carolina: (SAS Institute Inc., 2010) Delwiche, L. and Slaughter, S.: The Little SAS Book: A Primer. Fourth Edition. (SAS Institute Inc, 2008) 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) moodle.hku.hk				

STAT2605 Demographic a	and socio-economic statistics (6 credits)	Academic Year	2014				
Offering Department	Statistics & Actuarial Science Quota						
Course Co-ordinator	Ms L M S Kwan, Statistics & Actuarial Science (lucykwan@hku.hk	Ms L M S Kwan, Statistics & Actuarial Science (lucykwan@hku.hk)					
Teachers Involved	Ms L M S Kwan, Statistics & Actuarial Science						
Course Objectives	The course covers the major methods for studying demograph provide quantitative information on the essential aspects of the livaims to provide students with 1) basic knowledge including the methods and statistical indicators; and 2) skills in the statistic interpretation and application to planning, policy-making and common terms of the course of the	res of citizens in a terri e underlying principles al descriptions of a t	tory. The cours				
Course Contents & Topics	Population structure, fertility, mortality, migration, life tables, popul Social statistics on health, housing, labour, and social inequality; Economic statistics on GDP and green GDP, prices;	ation projections;					

		theory and methods of official statistic would be especially drawn from Hor				
Course Learning Outcomes	On successful completion of this course, students should be able to:					
	territory. 2. Further Hong Kor 3. Predict	<ol> <li>Describe and interpret major official &amp; other publicly disseminated socio-economic statistics of a territory.</li> <li>Further appraise and analyse the socio-economic well-being of a territory with particular reference to Hong Kong and mainland China.</li> <li>Predict a future situation by assimilating and deriving from appropriate statistics.</li> <li>Critically assess statistics reporting.</li> </ol>				
Pre-requisites (and Co-requisites and Impermissible combination)	or 2 or eq Pass in o economic Probability	(Level 2 or above in HKDSE Mathematics or Level 2 or above in HKDSE Mathematics Exended 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, STAT1602 Business statistics, STAT2601 Probability and statistics I, STAT1603 Introductory statistics, STAT2901 Probability and statistics: foundations of actuarial science				
Offer in 2014 - 2015	Y 2nd	Y 2nd sem Examination May				
Offer in 2015 - 2016	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	D Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.				
	Fail  Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.					
Course Type	Lecture-b	ased course				
Course Teaching	Activitie	s	Details	No. of Hours		
& Learning Activities	Lectures			36		
	Tutorials			12		
	Reading	/ Self study		100		
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)		
	Assignm	ents	Coursework (assignments, tutorials and a test)	25		
	Examina	tion	One 2-hour written examination	75		
Required/recommended reading and online materials	Pollard A.	H., Yusuf F., & Pollard G. N.: Demog	s Department, Hong Kong SAR, latest graphic Techniques (Pergamon Press, tics - an OECD Perspective (OECD, 2	1990, 3rd edition)		
Course Website	moodle.hl	cu hk				

STAT2901 Probability and credits)	d statistics: foundations of actuarial science (6	Academic Year	2014		
Offering Department	Statistics & Actuarial Science	Quota			
Course Co-ordinator	Dr Y K Chung, Statistics & Actuarial Science (yukchung@hku.h	nk)			
Teachers Involved	Dr Y K Chung, Statistics & Actuarial Science				
Course Objectives	The purpose of this course is to develop knowledge of the fundamental tools in probability and statistics for quantitatively assessing risk. Applications of these tools to actuarial science problems will be emphasized. Students will have a thorough command of probability topics and the supporting calculations.				
Course Contents & Topics	1. General Probability Basic elements of probability in set notation Mutually exclusive events Addition and multiplication rules Independence of events Combinatorial probability Conditional probability and expectations Bayes Theorem / Law of total probability Random variables Univariate probability distributions (including binomial, neg Poisson, uniform, exponential, chi-square, beta, Pareto, logr bivariate normal distribution				

	<ul><li>Cumulati</li><li>Mode, me</li><li>Variance</li><li>Central L</li></ul>	ty functions and probability density functions ve distribution functions edian, percentiles and moments and measures of dispersion imit Theorem ig distributions and introduction of estimation			
Course Learning Outcomes	Underst     Develop	sful completion of this course, students should be able to: and the mathematical theory underlying the modern practice of statistics. b skills in probabilistic analysis for problems involving randomness. behaviores in probability and statistics to solve actuarial science problems.			
Pre-requisites (and Co-requisites and Impermissible combination)	enrolled in (for studen Not for stu	MATH1821 Mathematical methods for actuarial science I (for BSc(ActuarS this course) or (Pass in MATH1013 University mathematics II or already at soutside the BSc(ActuarSc) programme); and udents who have passed or enrolled in any of these courses: STAT1601 STAT1602 Business statistics, STAT2601 Probability and statistics I, STAT1602 Business statistics, STAT2601 Probability and statistics I, STAT2601 Probability and statistics I, STAT2601 Probability and STAT2601 Probability STAT2601 Probability Albertage STAT2601 Probability STAT2601 Probab	enrolled in this course  Elementary statistical		
Offer in 2014 - 2015	Y 2nd	sem Examination	May		
Offer in 2015 - 2016	Υ	<u>'</u>	'		
Course Grade	A+ to F				
Grade Descriptors	A	Demonstrate thorough mastery at an advanced level of extensive knowledge and skills course learning outcomes. Show strong analytical and critical abilities and logical thinkir thought, and ability to apply knowledge to a wide range of complex, familiar and unfam effective organizational and presentational skills.	ng, with 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.				
		initial and initial and initial and initial and process of game and game	entational skills.		
	D	Demonstrate partial but limited command of knowledge and skills required for attaining s outcomes. Show evidence of some coherent and logical thinking, but with limited and Show limited ability to apply knowledge to solve problems. Apply limited or barely e presentational skills.	some of the course learning alytical and critical abilities. Iffective organizational and		
	D Fail	Demonstrate partial but limited command of knowledge and skills required for attaining s outcomes. Show evidence of some coherent and logical thinking, but with limited and Show limited ability to apply knowledge to solve problems. Apply limited or barely e	some of the course learning allytical and critical abilities. Iffective organizational and taining the course learning ry little or no ability to apply		
Course Type	Fail	Demonstrate partial but limited command of knowledge and skills required for attaining soutcomes. Show evidence of some coherent and logical thinking, but with limited and Show limited ability to apply knowledge to solve problems. Apply limited or barely e presentational skills.  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	some of the course learning allytical and critical abilities. Iffective organizational and taining the course learning ry little or no ability to apply		
Course Teaching	Fail	Demonstrate partial but limited command of knowledge and skills required for attaining soutcomes. Show evidence of some coherent and logical thinking, but with limited and Show limited ability to apply knowledge to solve problems. Apply limited or barely e presentational skills.  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 effectives assed course	some of the course learning alytical and critical abilities. Iffective organizational and taining the course learning ry little or no ability to apply		
	Fail Lecture-ba	Demonstrate partial but limited command of knowledge and skills required for attaining soutcomes. Show evidence of some coherent and logical thinking, but with limited and Show limited ability to apply knowledge to solve problems. Apply limited or barely e presentational skills.  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 effectives assed course	some of the course learning alytical and critical abilities. Iffective organizational and taining the course learning ry little or no ability to apply we or ineffective.		
Course Teaching	Fail Lecture-ba	Demonstrate partial but limited command of knowledge and skills required for attaining soutcomes. Show evidence of some coherent and logical thinking, but with limited and Show limited ability to apply knowledge to solve problems. Apply limited or barely e presentational skills.  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 effectives assed course	some of the course learning alytical and critical abilities. Iffective organizational and taining the course learning ry little or no ability to apply ve or ineffective.		
Course Teaching	Fail  Lecture-ba  Activities  Lectures  Tutorials	Demonstrate partial but limited command of knowledge and skills required for attaining s outcomes. Show evidence of some coherent and logical thinking, but with limited and Show limited ability to apply knowledge to solve problems. Apply limited or barely e presentational skills.  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 we knowledge to solve problems. Organization and presentational skills are minimally effective asset course  Details  Details	some of the course learning alytical and critical abilities. Iffective organizational and taining the course learning ry little or no ability to apply we or ineffective.  No. of Hours  36		
Course Teaching	Fail  Lecture-ba  Activities  Lectures  Tutorials	Demonstrate partial but limited command of knowledge and skills required for attaining soutcomes. Show evidence of some coherent and logical thinking, but with limited and Show limited ability to apply knowledge to solve problems. Apply limited or barely expresentational skills.  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 we knowledge to solve problems. Organization and presentational skills are minimally effective assed course  Details  Verification.	some of the course learning alytical and critical abilities. Iffective organizational and taining the course learning ry little or no ability to apply we or ineffective.  No. of Hours  36 12 100		
Course Teaching & Learning Activities Assessment Methods	Fail  Lecture-ba  Activities Lectures Tutorials Reading /	Demonstrate partial but limited command of knowledge and skills required for attaining s outcomes. Show evidence of some coherent and logical thinking, but with limited and Show limited ability to apply knowledge to solve problems. Apply limited or barely e presentational skills.  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 we knowledge to solve problems. Organization and presentational skills are minimally effective asset course  Details  Tell study  Details  Coursework (assignments)	some of the course learning alytical and critical abilities. Iffective organizational and taining the course learning ry little or no ability to apply we or ineffective.  No. of Hours  36  12  100  Weighting in final course grade (%)		
& Learning Activities  Assessment Methods	Fail  Lecture-ba  Activities  Lectures  Tutorials  Reading /  Methods	Demonstrate partial but limited command of knowledge and skills required for attaining soutcomes. Show evidence of some coherent and logical thinking, but with limited and Show limited ability to apply knowledge to solve problems. Apply limited or barely expresentational skills.  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 we knowledge to solve problems. Organization and presentational skills are minimally effective ased course  Details  Testing Te	some of the course learning alytical and critical abilities. Iffective organizational and taining the course learning ry little or no ability to apply ve or ineffective.  No. of Hours  36  12  100  Weighting in final course grade (%)		
Course Teaching & Learning Activities Assessment Methods	Fail  Lecture-ba  Activities Lectures Tutorials Reading /  Methods  Assignme Examinati  I. Miller & Internation M. A. Bea Engineerin S. Ghahra M. Hassett S.M. Ross	Demonstrate partial but limited command of knowledge and skills required for attaining soutcomes. Show evidence of some coherent and logical thinking, but with limited and Show limited ability to apply knowledge to solve problems. Apply limited or barely expresentational skills.  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 we knowledge to solve problems. Organization and presentational skills are minimally effective ased course  Details  Tell study  Details  Coursework (assignments, tutorials, and a class test)	some of the course learning alytical and critical abilities. Iffective organizational and taining the course learning ry little or no ability to apply we or ineffective.  No. of Hours  No. of Hours  100  Weighting in final course grade (%)  25  75  s (Pearson Education ments, Insurance, and edition)		

STAT2902 Financial mathe	thematics (6 credits) Academic Year 2014				
Offering Department	Statistics & Actuarial Science	Quota			
Course Co-ordinator	Prof K C Yuen, Statistics & Actuarial Science (kcyuen@hku.hk)				
Teachers Involved	Prof K C Yuen, Statistics & Actuarial Science				
Course Objectives	This course introduces the fundamental concepts of financial mathematics which plays an important role in the development of basic actuarial techniques. Practical applications of these concepts are also covered.				
Course Contents & Topics	Key topics include: measurement of interest, annuities certain; discounted cash flow analysis; yield rates; amortization schedules and sinking funds; bonds and related securities; practical applications such as real estate mortgage and short sales; stochastic approaches to interest; and key terms of financial analysis such as yield curves, spot rates, forward rates, duration, convexity, and immunization.				
Course Learning Outcomes	On successful completion of this course, students should be able to:				

	2. Learn s 3. Do simp 4. Learn tl short sales 5. Quote in	tand the fundamental concepts of finar tandard actuarial notations for a variet olle discounted cashflow analysis using the operations of some commonly-ences, and so on. Interest in various modes and determin th Exam FM of the Society of Actuaries	y of annuities.  I basic annuities.  Ountered financial instruments such a  e interest rate based on a series of fir	, , ,	
Pre-requisites (and Co-requisites and Impermissible combination)	course; an	idents who have passed in STAT3615		•	
Offer in 2014 - 2015	Y 2nd	sem	Examination	May	
Offer in 2015 - 2016	Υ				
Course Grade	A+ to F				
Grade Descriptors	A	course learning outcomes. Show strong and	ced level of extensive knowledge and skills re- llytical and critical abilities and logical thinking, wide range of complex, familiar and unfamilia kills.	with 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	outcomes. Lack of analytical and critical abil	and of knowledge and skills required for attai ities, logical and coherent thinking. Show very and presentational skills are minimally effective	little or no ability to apply	
Course Type	Lecture-ba	ased course			
Course Teaching	Activities	3	Details	No. of Hours	
& Learning Activities	Lectures			36	
	Tutorials		tutorials/example classes	12	
	Reading /	/ Self study		100	
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	
	Assignme	ents	Coursework (assignments, tutorials, and class test(s))	25	
	Examinat	ion	One 3-hour written examination	75	
Required/recommended reading and online materials	Broverman	S. G.: The Theory of Interest (Irwin: Illir n, S. A.: Mathematics of Investment ut, 2004, 3rd edition)		- Mad River Books:	
Course Website	moodle.hk				

STAT3600 Linear statistic	al analysis (6 credits)	Academic Year	2014		
Offering Department	Statistics & Actuarial Science	Quota			
Course Co-ordinator	Prof S M S Lee, Statistics & Actuarial Science (smslee@hku.hk)				
Teachers Involved	Prof T W K Fung, Statistics & Actuarial Science Prof S M S Lee, Statistics & Actuarial Science				
Course Objectives	The analysis of variability is mainly concerned with locating the st techniques investigate these sources through the use of 'linear' n and practice of these models.				
Course Contents & Topics	hypothesis tests and confidence intervals for regression paramete (2) Multiple linear regression: least squares method, analysis o reduced vs full models, hypothesis tests and confidence interval polynomial regression.  (3) One-way classification models: one-way ANOVA, analysis of tr (4) Two-way classification models: interactions, two-way ANOVA treatment effects, contrasts, randomised complete block design.  (5) Universal approach to linear modelling: dummy variables, 'mu one-way and two-way (unbalanced) models, ANCOVA models, co	and practice of these models.  (1) Simple linear regression: least squares method, analysis of variance, coefficient of determination, hypothesis tests and confidence intervals for regression parameters, prediction.  (2) Multiple linear regression: least squares method, analysis of variance, coefficient of determination, reduced vs full models, hypothesis tests and confidence intervals for regression parameters, prediction, polynomial regression.  (3) One-way classification models: one-way ANOVA, analysis of treatment effects, contrasts.  (4) Two-way classification models: interactions, two-way ANOVA for balanced data structures, analysis of treatment effects, contrasts, randomised complete block design.  (5) Universal approach to linear modelling: dummy variables, 'multiple linear regression' representation of one-way and two-way (unbalanced) models, ANCOVA models, concomitant variables.  (6) Regression diagnostics: leverage, residual plot, normal probability plot, outlier, studentized residual,			
Course Learning Outcomes	On successful completion of the course, students should be able to 1. Understand linear regression model with one or multiple indeper 2. Understand ANOVA models for one and two factors.  3. Understand general linear model with categorical and continuous	ndent variables.	<del>9</del> 8.		

Pre-requisites (and Co-requisites and Impermissible combination)	Not for s	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.				
Offer in 2014 - 2015	Y 1s	t sem 2nd sem	Examination	Dec May		
Offer in 2015 - 2016	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.				
	В	Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills				
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.				
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course 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 and presentational skills.				
	Fail	Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.				
Course Type	Lecture-b	pased course				
Course Teaching	Activities		Details	No. of Hours		
& Learning Activities	Lectures	S		36		
	Tutorials	3		12		
	Reading	g / Self study		100		
Assessment Methods and Weighting	Method	s	Details	Weighting in final course grade (%)		
	Assignm	nents	Coursework (assignments, tutorials and a test)	25		
	Examina	ation	One 2-hour written examination	75		
Required/recommended reading and online materials	(McGraw Berry, D. Draper, N Krzanow	Michael H Kutner, Christopher J. Nachtsheim, John Neter, William Li: Applied Linear Statistical Models (McGraw-Hill/Irwin; 5th edition) Berry, D. A. & Lindgren, B. W.: Statistics: Theory and Methods (Duxbury Belmont, 1996) Draper, N. R. & Smith, H.: Applied Regression Analysis (Wiley, New York, 1998) Krzanowski, W. J.: An Introduction to Statistical Modelling (Arnold, London, 1998) Montgomery, D. C. & Peck, E. A.: Introduction to Linear Regression Analysis (Wiley, New York, 1992)				
Course Website	moodle.h	ıku.hk				

STAT3602 Statistical inferen	ence (6 cred	lits)		Academic Year	2014
Offering Department	Statistics &	Actuarial Science		Quota	
Course Co-ordinator	Prof S M S	Lee, Statistics & Actuarial	Science (smslee@hku.hk)		
Teachers Involved	Prof S M S	Lee, Statistics & Actuarial	Science		
Course Objectives	testing. Us inferential	This course covers the advanced theory of point estimation, interval estimation and hypothesis testing. Using a mathematically-oriented approach, the course provides a solid and rigorous treatment of inferential problems, statistical methodologies and the underlying concepts and theory. It is suitable in particular for students intending to further their studies or to develop a career in statistical research.			
Course Contents & Topics	1. Paradigms of inference: frequentist, Bayesian, Fisherian.     2. Decision theory: loss function; risk; decision rule; admissibility; minimaxity; unbiasedness; Bayes' rule.     3. Estimation theory: exponential families; likelihood; sufficiency; minimal sufficiency; ancillarity completeness; UMVU estimators; information inequality; large-sample theory of maximum likelihood estimation.     4. Hypothesis testing: uniformly most powerful test; monotone likelihood ratio; unbiasedness; UMF unbiased test: maximal invariants: most powerful invariant test: large-sample theory of likelihood ratio.				
Course Learning Outcomes	1. Form a p	eanoramic view of classica rough insight into the esse	se, students should be able to I developments in mathematic entials of statistical inference. esearch studies in statistics a	cal statistics.	
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in ST	AT2602 Probability and st	atistics II or STAT3902 Statist	ical models	
Offer in 2014 - 2015	Y 1st s	em		Examination	Dec
Offer in 2015 - 2016	Υ				
Course Grade	A+ to F				
Grade Descriptors	A	Demonstrate thorough master	y at an advanced level of extensive	knowledge and skills require	ed for attaining all the

		course learning outcomes. Show strong and thought, and ability to apply knowledge to a effective organizational and presentational sk		
	В	the course learning outcomes. Show evider	ad range of knowledge and skills required fo ace of analytical and critical abilities and log iliar situations. Apply effective organizational	ical thinking, and ability to
	С	learning outcomes. Show evidence of some	and of knowledge and skills required for att analytical and critical abilities and logical th moderately effective organizational and prese	inking, and ability to apply
	D		knowledge and skills required for attaining sont and logical thinking, but with limited anal solve problems. Apply limited or barely ef	lytical and critical abilities.
	Fail		and of knowledge and skills required for attities, logical and coherent thinking. Show verund presentational skills are minimally effective	y little or no ability to apply
Course Type	Lecture-ba	ased course		
Course Teaching	Activities	s	Details	No. of Hours
& Learning Activities	Lectures			36
	Tutorials			12
	Reading / Self study			100
Assessment Methods and Weighting	Methods	;	Details	Weighting in final course grade (%)
	Assignme	ents	Coursework (assignments, tutorials, and a class test)	25
	Examination		One 2-hour written examination	75
Required/recommended reading and online materials	Berry, D. A. & Lindgren, B. W.: Statistics: Theory and Methods (Duxbury, Belmont, 1996) Bickel, P. J. & Doksum, K. A.: Mathematical Statistics: Basic Ideas and Selected Topics, Vol. 1 (Prent Hall, Upper Saddle River, N.J., 2001) Freund, J. E.: Mathematical Statistics (Prentice Hall, Englewood Cliffs, N.J., 1992) Hogg, R. V. & Craig, A. T.: Introduction to Mathematical Statistics (Macmillan, New York, 1989) Pace, L. & Salvan, A.: Principles of Statistical Inference: from a neo-Fisherian perspective (Wo Scientific: Singapore, 1997). Young, G.A. & Smith, R.L.: Essentials of Statistical Inference (Cambridge University Press: Cambrid 2005).			opics, Vol. 1 (Prentice York, 1989) In perspective (World
Course Website	moodle.hk	ku.hk		

STAT3603 Probability mod	delling (6 cr	redits)	Academic Year	2014	
Offering Department	Statistics 8	Actuarial Science	Quota		
Course Co-ordinator	Dr K S Cho	ong, Statistics & Actuarial Science (kschong@hku.hk)			
Teachers Involved	Dr K S Cho	ong, Statistics & Actuarial Science			
Course Objectives	This is an i	introductory course in probability modelling. A range of incussed.	mportant topics in stoo	chastic processes	
Course Contents & Topics	Introduction to probability theory, conditional probability and expectation, Markov chains, random walk models, classification of states in a Markov chain, calculation of limiting probabilities and mean time spen in transient states, Poisson process, distribution of interarrival time and waiting time, conditional distribution of the arrival time, Brownian Motion, hitting time and maximum variable, geometric Brownian motion, the Black-Scholes option pricing formula, Gaussian bridge, and stationary processes. Birth-and death process, branching process and renewal process may also be covered (if time permits).				
Course Learning Outcomes	Apply th     Understa	On successful completion of the course, students should be able to:  1. Apply the conditioning method to calculate the mean and probability.  2. Understand the essentials of Markov chains, the Poisson process, and Brownian motion.  3. Understand how stochastic models can be applied to the study of real-life phenomena.			
Pre-requisites (and Co-requisites and Impermissible combination)	Not for stu	AT2601 Probability and statistics I; and udents who have passed in MATH3603 Probability the due to the have passed in STAT3903 Stochastic mountains who have passed in STAT3903 Stochastic mountains.	,,		
Offer in 2014 - 2015	Y 1st s	sem	Examination	Dec	
Offer in 2015 - 2016	Υ				
Course Grade	A+ to F				
Grade Descriptors	A	Demonstrate thorough mastery at an advanced level of extensive king course learning outcomes. Show strong analytical and critical abiliting thought, and ability to apply knowledge to a wide range of complex effective organizational and presentational skills.	es and logical thinking, with	evidence of original	
	В	Demonstrate substantial command of a broad range of knowledge the course learning outcomes. Show evidence of analytical and cri apply knowledge to familiar and some unfamiliar situations. Apply eff	tical abilities and logical th	inking, and ability to	
	С	Demonstrate general but incomplete command of knowledge and learning outcomes. Show evidence of some analytical and critical a			

		knowledge to most familiar situations. Apply m	oderately effective organizational and prese	ntational skills.	
	D	Demonstrate partial but limited command of k outcomes. Show evidence of some coherent Show limited ability to apply knowledge to spresentational skills.	and logical thinking, but with limited analy	ytical and critical abilities.	
	Fail	outcomes. Lack of analytical and critical abiliti	Demonstrate little or no evidence of command of knowledge and skills required for attaining the coutcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no a knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.		
Course Type	Lecture-	Lecture-based course			
Course Teaching & Learning Activities	Activiti	es	Details	No. of Hours	
	Lectures			36	
	Tutorials			12	
	Reading / Self study			100	
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	
	Assignments		Coursework (assignments, tutorials, and a class test)	25	
	Examination		One 2-hour written examination	75	
Required/recommended reading and online materials	S. M. Ro	ss: Introduction to Probability Models (9th	n edition)		
Course Website	moodle.	nku.hk			

STAT3604 Design and ana	alysis of ex	periments (6 credits)	Ac	ademic Year	2014	
Offering Department	Statistics	& Actuarial Science	Qu	ota		
Course Co-ordinator	Dr G Li, S	Statistics & Actuarial Science (gdli@hku	ı.hk)			
Teachers Involved	Dr G Li, S	Statistics & Actuarial Science				
Course Objectives	introduce	research often requires proper desi the basic principles of experimental de odel-based analysis of experiment.				
Course Contents & Topics	randomis	nciples and guidelines for designing exected block, crossed and nested factorial and related designs. Fixed/random effected	structure. Balanced incon			
Course Learning Outcomes	1. Develo 2. Acquir appropria 3. Select	On successful completion of the course, students should be able to:  1. Develop a conceptual understanding of experimental design.  2. Acquire the fundamental statistical tools of experimental design and the understanding to use ther appropriately.  3. Select appropriate experimental designs for different problems.  4. Select appropriate statistical model and to know how to validate the model.				
Pre-requisites (and Co-requisites and Impermissible combination)		Pass in STAT2602 Probability and statistics II or STAT3902 Statistical models or STAT3611 Computer aided data analysis				
Offer in 2014 - 2015	Y 2n	d sem	Ex	amination	May	
Offer in 2015 - 2016	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 most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.				
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.				
	D	Demonstrate partial but limited command of outcomes. Show evidence of some cohere Show limited ability to apply knowledge to presentational skills.	nt and logical thinking, but wit	h limited analytical	and critical abilities.	
	Fail	Demonstrate little or no evidence of commoutcomes. Lack of analytical and critical abil knowledge to solve problems. Organization a	ities, logical and coherent think	ing. Show very little	or no ability to apply	
Course Type	Lecture-b	ased course				
Course Teaching	Activitie	s	Details		No. of Hours	
& Learning Activities	Lectures				36	
	Tutorials				12	

	Reading / Self study		100
ssessment Methods nd Weighting	Methods	Details	Weighting in final course grade (%)
	Assignments	Coursework (assignments, tutorials, and a class test)	25
	Examination	One 2-hour written examination	75
Required/recommended reading and online materials	D. R. Cox: Planning of Experiments A. L. Edwards: Experimental Design G. A. Ferguson & Y. Takane: Statis edition) C. R. Hicks & K. V. Turner Jr.: Fun edition) P. W. M. John: Statistical Design and	ysis of Experiments (Wiley, 1997, 4th edition) (Wiley, 1958) in Psychological Research (Harper & Row, 1988 stical Analysis in Psychology and Education (Madamental Concepts in the Design of Experiment d Analysis of Experiments (Macmillan, 1971) ess: Statistical Design and Analysis of Experime	lcGraw Hill, 1989, 6th onts (Oxford, 1999, 5th
Course Website	moodle.hku.hk		

STAT3605 Quality control	and manag	ement (6 credits)		Academic Year	2014
Offering Department	Statistics 8	Actuarial Science		Quota	
Course Co-ordinator	Dr K S Cho	ong, Statistics & Actuarial Science (kscl	nong @hku.hk)		
Teachers Involved	Dr K S Cho	ong, Statistics & Actuarial Science			
Course Objectives	prosperity. the consulting sequential total quality	essful control of quality in production. This course provides an overview of quer. It presents a variety of statistic sampling plans, reliability, and life-testing control, zero defects, six-sigma, and of today's quality control and managen	uality compromise what solutions including contemporary qualicolumn.	nich involves both g control charts, ality management	the producer and acceptance and systems such as
Course Contents & Topics	inference. curves. Sin schemes.	distributions and their applicatio Process control, variables and ngle, double and sequential sa Variables sampling. Reliability //anagement of quality control, total qua	attributes control mpling plans. MIL- and life-testing.	charts. Operating STD-105D and Elementary	characteristic Dodge-Romig experimental
Course Learning Outcomes	On succes	sful completion of the course, students	should be able to:		
	2. Understa	<ol> <li>Appreciate the practicality of statistical concepts and methods in general.</li> <li>Understand how certain specific statistical methods can benefit various production situations.</li> <li>Know the traditional and modern systems of quality management.</li> </ol>			
Pre-requisites (and Co-requisites and Impermissible combination)	course) or Business	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 (STAT1600 Business statistics and any University level 2 course) or STAT2602 Probability and statistics II o (STAT1603 Introductory statistics and any University level 2 course) or STAT3902 Statistical models			
Offer in 2014 - 2015	Y 2nd	sem		Examination	May
Offer in 2015 - 2016	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	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.			
		Demonstrate little or no evidence of command of knowledge and skills required for attaining the co outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no a knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.			
	Fail	outcomes. Lack of analytical and critical abilities	es, logical and coherent thi	nking. Show very little	or no ability to apply
Course Type		outcomes. Lack of analytical and critical abilities	es, logical and coherent thi	nking. Show very little	or no ability to apply
Course Teaching		outcomes. Lack of analytical and critical abilitie knowledge to solve problems. Organization and sed course	es, logical and coherent thi	nking. Show very little	or no ability to apply effective.
Course Teaching	Lecture-ba	outcomes. Lack of analytical and critical abilitie knowledge to solve problems. Organization and sed course	es, logical and coherent thi d presentational skills are r	nking. Show very little	or no ability to apply
Course Teaching	Lecture-ba  Activities	outcomes. Lack of analytical and critical abilitie knowledge to solve problems. Organization and sed course	es, logical and coherent thi d presentational skills are r	nking. Show very little	or no ability to apply effective.
Course Type Course Teaching & Learning Activities	Lecture-ba Activities Lectures Tutorials	outcomes. Lack of analytical and critical abilitie knowledge to solve problems. Organization and sed course	es, logical and coherent thi d presentational skills are r	nking. Show very little	or no ability to apply effective.  No. of Hours

	Assignments	Coursework (assignments, tutorials, and a class test)	25		
	Examination	One 2-hour written examination	75		
Required/recommended reading and online materials	A. J. Duncan: Quality Control and Industrial Statistics (Irwin, Homewoor, 1986, 5th edition) D. C. Montgomery: Statistical Quality Control (New York: Wiley, 1996, 3rd edition) J. Banks: Principles of Quality Control (New York: Wiley, 1989) E. L. Grant & R. S. Leavenworth: Statistical Quality Control (New York: McGraw-Hill, 1988, 6th edition) I. D. Hill: An Introduction to Sampling Inspection (The Institute of Engineering Inspection Monograph, London, 1961) G. B. Wetherill: Sampling Inspection and Quality Control (London: Methuen, 1977, 2nd edition) A. V. Feigenbaum: Total Quality Control (New York: McGraw-Hill, 1983, 3rd edition)				
Course Website	moodle.hku.hk				

STAT3606 Business logist	ics (6 cred	lits)	Academic Yea	ar 2014		
Offering Department	Statistics	& 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	Modern business corporations are increasingly using logistics as a management tool, for example, in capital budgeting problems, production planning, scheduling, transportations and deciding location for a new factory. This course addresses the business applications of logistics.					
Course Contents & Topics	In this course, students will apply the analytical skills with aid of computer techniques in solving the business logistic problems. Topics include optimization techniques applied in allocation of resources, financial planning, transportation, assignment, inventory control and queuing problems.					
Course Learning Outcomes	On successful completion of the course, students should be able to:  1. Solve linear programming with Graphical approach, Simplex method and hands-on Excel Solving function.  2. Set-up and solve network flow problems using least-cost approach, MODI method and Vogel's approximation.  3. Understand decision theory and its applications.  4. Evaluate the cost and effectiveness of service systems.					
Pre-requisites (and Co-requisites and mpermissible combination)	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.					
Offer in 2014 - 2015	Y 1st	sem	Examination	Dec		
Offer in 2015 - 2016	Υ	Υ				
Course Grade	A+ to F					
Grade Descriptors	В	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.				
		the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.				
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.				
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.				
	Fail	Fail  Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.				
Course Type	Lecture-based course					
Course Teaching & Learning Activities	Activities	S	Details	No. of Hours		
	Lectures			30		
	Tutorials			1:		
	Reading / Self study			10		
Assessment Methods and Weighting	Methods	·	Details	Weighting in fina course grade (%		
	Assignments		Coursework (assignments, tutorials and a test)	25		
	Examination		One 2-hour written examination	7:		
			-			

reading and online materials	Wayne L. Winston: Operations Research, 4th edition, Thomson Learning H. Taha: An Introduction to Operations Research, 8th edition, Pearson International Edition F.S. Hillier and G, J. Lieberman: An Introduction to Operations Research Robert F.V. Anderson, Holt, Rinehart and Winston: Introduction to Linear Algebra	
Course Website	moodle.hku.hk	

STAT3607 Statistics in clicredits)	nical medic	cine and bio-medical research (6	i	Academic Year	2014
Offering Department	Statistics	& Actuarial Science		Quota	
Course Co-ordinator	Prof G Yir	n, Statistics & Actuarial Science (gyin@l	hku.hk)		
Teachers Involved	Prof G Yir	n, Statistics & Actuarial Science			
Course Objectives	methodolo arise from frequentis	I research, medical data are often on the clinical observational and donclinical trial designs. It involves phase that approaches, sample size and powe the course provides the necessary bid.	ecision-making proc e I, II, III and IV clin r calculation. No ki	ess. Also, statistic ical trial designs, b nowledge in biolog	al problems often both Bayesian and gy or medicine is
Course Contents & Topics	data analy	ents of the course include contingency ysis, Bayesian designs, dose-finding me signs, hypothesis testing, adaptive desig	ethods, sample size	,	, ,
Course Learning Outcomes	On succes	ssful completion of the course, students	should be able to:		
	<ol> <li>Design</li> <li>Conduct</li> </ol>	tand the basic concepts in medical static clinical trials and compute sample sizes at statistical inference and apply regress nedical problems by using various statis	s. ion models.		
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in S	TAT2602 Probability and statistics II or \$	STAT3902 Statistica	I models	
Offer in 2014 - 2015	Y 2nd	d sem		Examination	May
Offer in 2015 - 2016	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 commar outcomes. Lack of analytical and critical abiliti knowledge to solve problems. Organization and	ies, logical and coherent	thinking. Show very little	e or no ability to apply
Course Type	Lecture-ba	ased course			
Course Teaching	Activitie	s	Details		No. of Hours
& Learning Activities	Lectures				36
	Tutorials				12
		/ Self study			100
Assessment Methods and Weighting	Methods	,	Details		Weighting in final course grade (%)
	Assignme	ents	Coursework (as tutorials, and a class	ssignments,	25
	Examina	tion	One 2-hour written	examination	75
Required/recommended reading and online materials	& Hall/CR J. Aitchisc P. Armita P. Armita D. Altman N. E. Bre control st D. R. Cox	on, J. W. Kay & I. J. Lauder: Statistical CC, 2004) on & J. Dunsmore: Statistical Prediction ge: Statistical Methods in Medical Resea ge: Sequential Medical Trials (Oxford: B i: Practical Statistics for Medical Resear slow & N. E. Day: Statistical Methods udies (Lyon: IARC, 1980) & E. J. Snell: The Analysis of Binary Da & D. V. Hinkley: Theoretical Statistics (	Analysis (Cambridgarch (Oxford: Blackw lackwell, 1975, 2nd ch (London: Chapma in Cancer Researd	e University Press, rell, 1971) edition) an & Hall, 1991) ch Volume 1 - The an and Hall, 1989,	1976) e analysis of case
Course Website	moodle.hl	,		,	
		565			

Additional Course Information	Other references: E. K. Harris & A. Albert: Survivorship Analysis for Clinical Studies (New York: Marcel Dekker, 1991) B. Jones & M. G. Kenward: Design and Analysis of Cross-Over Trials (London: Chapman and Hall, 1990) B. J. T. Morgan: Analysis of Quantal Response Data (London: Chapman and Hall, 1992) S. J. Pocock: Clinical Trials. A Practical Approach (Chickestes: John Wiley & Sons, 1991)	
	P. McCullagh & J. A. Nelder: Generalised Linear Models (London: Chapman and Hall, 1989, 2nd edition)	

STAT3608 Statistical general	tics (6 cred	lits)		Academic Year	2014	
Offering Department	Statistics 8	& Actuarial Science		Quota		
Course Co-ordinator	Prof T W k	CFung, Statistics & Actuarial Science (	wingfung @hku.hk)			
Teachers Involved	Prof T W k	CFung, Statistics & Actuarial Science				
Course Objectives	identification	se aims to provide students with a on and genetic epidemiology in gene re applied to solve forensic DNA and g	mapping and to un			
Course Contents & Topics	Weinberg probability gene map	se will cover the following topics: lequilibrium; linkage equilibrium; ch; paternity testing and kinship analysis; ng; parametric linkage analysis; ng designs; case-control analysis; family	i-square test; likelih sis; DNA mixed stair son-parametric linkaç	ood ratio test; e n; relatedness; pop ge analysis; linkaç	xact test; match oulation structure; ge disequilibrium;	
Course Learning Outcomes	On succes	sful completion of the course, students	s should be able to:			
	<ol><li>Know th mapping.</li></ol>	and the fundamental principles in static e usefulness and possible limitations of statistical solutions to specific problem	of statistical methodol			
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in ST	AT2602 Probability and statistics II or	STAT3902 Statistical	models		
Offer in 2014 - 2015	Y 2nd	sem		Examination	May	
Offer in 2015 - 2016	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.					
	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	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 comma outcomes. Lack of analytical and critical abili knowledge to solve problems. Organization a	ties, logical and coherent t	hinking. Show very little	e or no ability to apply	
Course Type	Lecture-ba	ised 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 (%)	
	Assignme	ents	Coursework (as tutorials, and a class	signments,	25	
	Examinat	ion	One 2-hour written	examination	75	
Required/recommended reading and online materials	Ott, J.: Ana Ziegler, A. Evett, I. W	and Cummings, M. R.: Essentials of alysis of Human Genetic Linkage (The and Konig, I.R.: A Statistical Approach and Weir, B. S.: Interpreting DNA Evi K. and Hu, Y. Q.: Statistical DNA Fore	Johns Hopkins Univento Genetic Epidemic dence (Sinauer Asso	ersity Press, 1999, blogy (Wiley-VCH, ciates, Inc. Publish	2006) iers, 1998)	
	moodle.hk					

STAT3609 The statistics of	investment risk (6 credits)	Academic Year	2014
Offering Department	Statistics & Actuarial Science	Quota	

Course Co-ordinator		at, Statistics & Actuarial Science (watk	Jennu.lin)			
Teachers Involved	Dr K P Wa	at, Statistics & Actuarial Science				
Course Objectives	uncertaint provide a markets fo	stments involve some risk. The decision y. Whilst prediction of the future is contained framework for investment decipational framework for investment decipations are trates, commodities and curbins course presents the prevailing states.	difficult, there are statistical modell isions, particularly those relating to rencies. Building upon research, bo	ing techniques which stock markets and the oth in Hong Kong and		
Course Contents & Topics		of market efficiency, mean-variance portfolio performance and management,		odel, arbitrage pricing		
Course Learning Outcomes	1. Measur 2. Apply d 3. Explain 4. Explain	essful completion of the course, students re risk and return of portfolios. ifferent approaches in constructing opt and apply asset pricing models and even the concepts of market efficiency and market efficiency.	imal investment portfolios. valuate investment performance.	es to assess different		
Pre-requisites (and Co-requisites and Impermissible combination)	level 2 cou Not for st enrolled in	STAT2602 Probability and statistics II urse) or STAT3611 Computer-aided da tudents who have passed in FINA23 n this course; and cc(Actuarial Science) students	ita analysis or STAT3614 Business f	orecasting; and		
Offer in 2014 - 2015	Y 1st	sem	Examination	Dec		
Offer in 2015 - 2016	Υ					
Course Grade	A+ to F					
Grade Descriptors	A	Demonstrate thorough mastery at an advance course learning outcomes. Show strong and thought, and ability to apply knowledge to a effective organizational and presentational ske	lytical and critical abilities and logical thinking wide range of complex, familiar and unfamil	g, 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	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 comma outcomes. Lack of analytical and critical abili knowledge to solve problems. Organization a	ities, logical and coherent thinking. Show very	y little or no ability to apply		
Course Type	Lecture-ba	ased course				
Course Teaching	Activities	s	Details	No. of Hours		
& Learning Activities	Lectures			36		
	Tutorials			12		
	Reading	/ Self study		100		
Assessment Methods and Weighting	Methods	•	Details	Weighting in final course grade (%)		
	Assignme	ents	Coursework (assignments, tutorials and class test(s))	30		
	Examinat	tion	One 2-hour written examination	70		
Required/recommended reading and online materials	McGraw-Felton, E. Investmer Luenberg Defusco, I CFA Instit Fabozzi, I CAPM to Ruppert, I	Kane, A., and Marcus, A. J. (2011 Hill.) J., Gruber, M. J., Brown, S. J., and the Analysis (8th Edition). John Wiley. Ber, D. G. (2009). Investment Science (Inc. A., McLeavey, D. W., Pinto, J. E., at the Investment Series (2nd Edition). New Jersey: Wiley. Cointegration. New Jersey: Wiley. D. (2004). Statistics and Finance: An Inc. F. and Chiang, R. C. P. (1997). The	Goetzmann, W. N. (2011). Modern nternational Edition). Oxford Univers nd Runkle D. E. (2007). Quantitative ew Jersey: Wiley (2006). Financial Modelling of the troduction. New York: Springer.	Portfolio Theory and ity Press. e Investment Analysis, Equity Market: From		
			ie florig Rong Gecanties maastry (5	ra Lamony. The Glock		
		of Hong Kong.	ic Florig Rong decumes industry (o	ra Edition). The Oto		

STAT3610 Risk manage	ement and insurance (6 credits)	Academic Year	2014
Offering Department	Statistics & Actuarial Science	Quota	
Course Co-ordinator	Dr R W L Wong, Statistics & Actuarial Science (rwong@hku.hk	r)	
Teachers Involved	Dr R W L Wong, Statistics & Actuarial Science		

Activities Lectures Tutorials Reading /  Methods Assignme Examinati	Demonstrate little or no evidence of commoutcomes. Lack of analytical and critical abknowledge to solve problems. Organization ased course  Self study  E.: Principles of Risk Management arinn, J., Hoyt, R. E. and Sommer, D.	nand of knowledge and skills required for atta ilities, logical and coherent thinking. Show very and presentational skills are minimally effective    Details	No. of Hours  No. of Hours  No. of Hours  100  Weighting in final course grade (%)  25  75  xy, 10th edition)	
Lecture-ba  Activities Lectures Tutorials Reading /  Methods  Assignment	Demonstrate little or no evidence of commoutcomes. Lack of analytical and critical abknowledge to solve problems. Organization ased course  Self study	Details  Coursework (assignments, tutorials, and a class test)	No. of Hours  No. of Hours  12  100  Weighting in final course grade (%)	
Lecture-ba  Activities Lectures Tutorials Reading /  Methods	Demonstrate little or no evidence of commoutcomes. Lack of analytical and critical abknowledge to solve problems. Organization assed course  Self study	Details  Details  Coursework (assignments,	No. of Hours  No. of Hours  100  No. of Hours  No. of Hours  Weighting in final course grade (%)	
Lecture-ba  Activities Lectures Tutorials Reading /	Demonstrate little or no evidence of commoutcomes. Lack of analytical and critical abknowledge to solve problems. Organization ased course	ilities, logical and coherent thinking. Show very and presentational skills are minimally effective   Details	ining the course learning little or no ability to apply or ineffective.  No. of Hours  36  12  100  Weighting in final	
Lecture-ba  Activities  Lectures  Tutorials	Demonstrate little or no evidence of commoutcomes. Lack of analytical and critical ab knowledge to solve problems. Organization ased course	ilities, logical and coherent thinking. Show very and presentational skills are minimally effective	ining the course learning little or no ability to apply or ineffective.  No. of Hours  36	
Lecture-ba  Activities  Lectures	Demonstrate little or no evidence of commoutcomes. Lack of analytical and critical ab knowledge to solve problems. Organization ased course	ilities, logical and coherent thinking. Show very and presentational skills are minimally effective	ining the course learning little or no ability to apply or ineffective.  No. of Hours	
Lecture-ba	Demonstrate little or no evidence of commoutcomes. Lack of analytical and critical ab knowledge to solve problems. Organization ased course	ilities, logical and coherent thinking. Show very and presentational skills are minimally effective	little or no ability to apply or ineffective.	
Lecture-ba	Demonstrate little or no evidence of commoutcomes. Lack of analytical and critical ab knowledge to solve problems. Organization ased course	ilities, logical and coherent thinking. Show very and presentational skills are minimally effective	nining the course learning little or no ability to apply or ineffective.	
	Demonstrate little or no evidence of commoutcomes. Lack of analytical and critical ab knowledge to solve problems. Organization	ilities, logical and coherent thinking. Show very	nining the course learning little or no ability to apply	
Fail	Demonstrate little or no evidence of commoutcomes. Lack of analytical and critical ab	ilities, logical and coherent thinking. Show very	nining the course learning little or no ability to apply	
	presentational skills.		oonvo organizational and	
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.			
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.			
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.			
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.				
A+ to F				
Υ				
Y 2nd	sem	Examination	May	
course) or Business (STAT160: statistics: f	(STAT1601 Elementary statistical n statistics and any University level 3 Introductory statistics and any U foundations of actuarial science.	nethods and any University level 2 co 2 course) or STAT2601 Probability	ourse) or (STAT1602 and statistics I or	
principle. 2. Demoninsurance 3. Underst 4. Compar 5. Plan for	strate knowledge and understandin industry. and how risk can be managed throug e and contrast different types of cominand arrange their own personal insur	g of the underlying financial and le th insurance. mercial and personal insurance produrance needs.	gal principles of the	
	•			
- risk in ou - insurance - introducti - fundamer - life insura	r society, e and risk, ion to risk management, ntal legal principles, and analysis of ir ance, their contractual provisions,	nsurance contracts,		
insurance principles individuals	products, to students. To allow st underlying the techniques for mai . Aiming at students who have min	udents to understand the statistical naging the insurable risks faced by imal background in quantitative meth	, financial and legal y organisations and nods, it involves very	
	insurance principles individuals minimal quarter principles individuals minimal quarter principle.  Interest in our insurance introduct fundame life insuration individual on succes 1. Undersit principle.  Interest in Burnance 3. Undersit 4. Compart 5. Plan for Pass in Burnance 3. Undersit 4. Compart 5. Plan for Pass in Burnance or Business (STAT160 statistics: 1 (Not available Y 2nd Y A+ to F  A  B  C	insurance products, to students. To allow st principles underlying the techniques for mai individuals. Aiming at students who have min minimal quantitative calculations and is not avairable.  The course introduces and explains: - risk in our society, - insurance and risk, - introduction to risk management, - fundamental legal principles, and analysis of ir life insurance, their contractual provisions, - individual health insurance coverages.  On successful completion of the course, student 1. Understand the general risks faced by organ principle. 2. Demonstrate knowledge and understandin insurance industry. 3. Understand how risk can be managed throught. Compare and contrast different types of comininsurance industry. 4. Compare and contrast different types of comininsurance industry. 5. Plan for and arrange their own personal insurunces in BIOL2102 Biostatistics or (ECON128 course) or (STAT1601 Elementary statistical in Business statistics and any University level (STAT1603 Introductory statistics and any Ustatistics: foundations of actuarial science. (Not available to Actuarial Science students)  Y 2nd sem  Y  A+ to F  A Demonstrate thorough mastery at an advancourse learning outcomes. Show strong an thought, and ability to apply knowledge to effective organizational and presentational science learning outcomes. Show evidence of som knowledge to familiar and some unfar learning outcomes. Show evidence of som knowledge to most familiar situations. Apply Demonstrate partial but limited command outcomes. Show evidence of some cohern Show limited ability to apply knowledge to show limited ability to apply knowledge to soutcomes. Show evidence of some cohern Show limited ability to apply knowledge to soutcomes. Show evidence of some cohern Show limited ability to apply knowledge to soutcomes. Show evidence of some cohern Show limited ability to apply knowledge to soutcomes. Show evidence of some cohern Show limited ability to apply knowledge to soutcomes. Show evidence of some cohern Show limited ability to apply	- 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.  On successful completion of the course, students should be able to:  1. Understand the general risks faced by organisations and individuals and the generinciple. 2. Demonstrate knowledge and understanding of the underlying financial and le insurance industry. 3. Understand how risk can be managed through insurance. 4. Compare and contrast different types of commercial and personal insurance produ 5. Plan for and arrange their own personal insurance needs.  Pass in BIOL2102 Biostatistics or (ECON1280 Analysis of economic data and at course) or (STAT1601 Elementary statistical methods and any University level 2 curse) or STAT2601 Probability (STAT1603 Introductory statistics and any University level 2 course) or STAT2 statistics: foundations of actuarial science. (Not available to Actuarial Science students)  Y 2nd sem  A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills recursed in the course learning outcomes. Show strong analytical and critical abilities and logical thinking thought, and ability to apply knowledge to a wide range of knowledge and skills required for the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking apply knowledge to familiar and some unfamiliar situations. Apply effective organizational at learning outcomes. Show evidence of some analytical and critical abilities and logical thinking hourselds and critical abilities and logical thinking but with limited command of knowledge and skills required for attaining actuaring outcomes. Show evidence of some analytical and critical abilities and logical thinking but with limited command of knowledge and skills required for attaining actuaring outcomes. Show evidence of some coherent and logical thinking, but with limited analytical a	

STAT3611 Computer-a	ided data analysis (6 credits)	Academic Year	2014
Offering Department	Statistics & Actuarial Science	Quota	
Course Co-ordinator	Dr E K F Lam, Statistics & Actuarial Science (hrntlkf@hku.hk)		
Teachers Involved	Dr E K F Lam, Statistics & Actuarial Science Dr K Y Wu, Statistics & Actuarial Science Ms O T K Choi, Statistics & Actuarial Science		
Course Objectives	A wide range of statistical analyses and methods are present research and scientific studies. Measuring uncertainty, describ relationship between several variables are essential aspects of	oing patterns of variability	and the inter-

	concepts	ling of statistics. This computer-orien and methods of statistics. The cours tistical software JMP. No knowledge o	e makes extensive use of comput	ers through the user	
Course Contents & Topics		oration, formulation of testable hypoth st experience.	eses, the evaluation of evidence a	nd forecasting on the	
Course Learning Outcomes	1. Summa 2. Describ variables. 3. Carry or	sful completion of the course, students rize and describe the quantitative and determine the patterns of variability and the interpretation interpretation interpretation of the statistical inferences and make interpretation.	qualitative data using some simple s nter-relationship between several o some real life data, formulate testa	ontinuous or discrete	
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in B course) or Business University Not for str	OL2102 Biostatistics or (ECON1280 (STAT1601 Elementary statistical mestatistics and any University level 2 level 2 course); and udents who have passed in or have and statistics I, STAT2901 Probat Advanced SAS programming	Analysis of economic data and a ethods and any University level 2 c course) or (STAT1603 Introducto e already enrolled in any of these	ourse) or (STAT1602 ry statistics and any courses: STAT2601	
Offer in 2014 - 2015	N		Examinatio	n	
Offer in 2015 - 2016	N			·	
Course Grade	A+ to F				
Grade Descriptors	A	Demonstrate thorough mastery at an advanc course learning outcomes. Show strong anal thought, and ability to apply knowledge to a effective organizational and presentational sk	lytical and critical abilities and logical thinking wide range of complex, familiar and unfamil	g, with evidence of original	
	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 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 abilit knowledge to solve problems. Organization at			
Course Type	Lecture-ba	sed 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 (%)	
	Assignme	nts	Coursework (assignments, practical work, and a term test)	40	
	Examinat	on	One 2-hour written examination	60	
Required/recommended reading and online materials	edition) E. R. Babb J. E. Freur R. Hooke: D. G. Klei Methods (I	avos & D. M. Miller: An Introduction to ie: The Practice of Social Research (V d & G. A. Simon: Statistics - A First Co How to tell the liars from the Statisticia nbaum, L. L. Kupper, & K. E. Mulle Duxbury Press, 1988, 2nd edition) ne, M. L. Berenson, & D. Stephan: S dition)	Vadsworth Pub. Co., Belmont, 7th e- ourse (Prentice Hall, 7th edition) ans (Marcel Dekker) r: Applied Regression Analysis an	dition) d Other Multivariable	
Course Website	moodle.hk	u.hk			

STAT3612 Data mining (6 cm	redits)	Academic Year	2014
Offering Department	Statistics & Actuarial Science	Quota	10
Course Co-ordinator	Dr G C S Lui, Statistics & Actuarial Science (csglui@hku.hk)		

		ui, Statistics & Actuarial Science			
Course Objectives	fields such these data has led to process, a	plosion in information technology as finance, customer relations with the aim of creating new kn the innovative usage of statis new area called data mining is so of essential data mining concepts	management and medi owledge and finding ne tical methodologies and pawned. This course p	cine. The challeng ew relationships am d development of rovides a comprehe	le of understanding nong data attributes new ones. In this
Course Contents & Topics	Data pre-p analysis.	processing, association rules, cla	ssification and regressi	on trees, neural ne	etworks and cluster
Course Learning Outcomes	On succes	sful completion of the course, stu	dents should be able to:		
	exploring, 2. Underst strengths a 3. Be profit 4. Identify the nature 5. Evaluate	ent data mining process summ modifying, modeling, and assessi and and apply a wide range of and weaknesses. Eient with the leading data mining and use appropriate data mining of the data to be mined and the ge the quality of discovered knowl solved and the goals of the user.	ng data. data mining technique: softwareSAS Enterpr techniques for a data n oals of the user of the d edge, taking into accou	s, and recognize the sise Miner. In the sister of the sist	heir characteristics,  ng into account both
Pre-requisites (and Co-requisites and Impermissible combination)		TAT2602 Probability and statistic rse) or STAT3902 Statistical mod		oductory statistics	and any University
Offer in 2014 - 2015	Y 2nd	sem		Examination	No Exam
Offer in 2015 - 2016	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.				
			mamma ondanono rippiy on	oon to organization and	a procontational office
	С	Demonstrate general but incomplete of learning outcomes. Show evidence of knowledge to most familiar situations. A	command of knowledge and some analytical and critical a	skills required for attain bilities and logical thinki	ing most of the course ing, and ability to apply
	C D	learning outcomes. Show evidence of	command of knowledge and some analytical and critical a apply moderately effective organd of knowledge and skills resolute the analytical thinking,	skills required for attain bilities and logical thinki anizational and presenta quired for attaining some but with limited analytic	ing most of the course ing, and ability to apply tional skills.  e of the course learning all and critical abilities.
		learning outcomes. Show evidence of knowledge to most familiar situations. A Demonstrate partial but limited comma outcomes. Show evidence of some or Show limited ability to apply knowled	command of knowledge and some analytical and critical a upply moderately effective organd of knowledge and skills resherent and logical thinking, ge to solve problems. Apply command of knowledge and sal abilities, logical and coherer	skills required for attain bilities and logical thinki anizational and presenta quired for attaining some but with limited analytic limited or barely effect skills required for attainint thinking. Show very lit	ing most of the course ing, and ability to apply tional skills.  e of the course learning all and critical abilities, tive organizational and ting the course learning ttle or no ability to apply
Course Type	D Fail	learning outcomes. Show evidence of knowledge to most familiar situations. A Demonstrate partial but limited comma outcomes. Show evidence of some or Show limited ability to apply knowled presentational skills.  Demonstrate little or no evidence of coutcomes. Lack of analytical and critical	command of knowledge and some analytical and critical a upply moderately effective organd of knowledge and skills resherent and logical thinking, ge to solve problems. Apply command of knowledge and sal abilities, logical and coherer	skills required for attain bilities and logical thinki anizational and presenta quired for attaining some but with limited analytic limited or barely effect skills required for attainint thinking. Show very lit	ing most of the course ing, and ability to apply tional skills.  e of the course learning all and critical abilities, tive organizational and ting the course learning ttle or no ability to apply
Course Teaching	D Fail	learning outcomes. Show evidence of knowledge to most familiar situations. A Demonstrate partial but limited comma outcomes. Show evidence of some or Show limited ability to apply knowled presentational skills.  Demonstrate little or no evidence of coutcomes. Lack of analytical and critical knowledge to solve problems. Organizated course	command of knowledge and some analytical and critical a upply moderately effective organd of knowledge and skills resherent and logical thinking, ge to solve problems. Apply command of knowledge and sal abilities, logical and coherer	skills required for attain bilities and logical thinki anizational and presenta quired for attaining some but with limited analytic limited or barely effect skills required for attainint thinking. Show very lit	ing most of the course ing, and ability to apply titional skills.  e of the course learning all and critical abilities, titive organizational and ing the course learning ttle or no ability to apply r ineffective.
· · · · · · · · · · · · · · · · · · ·	D Fail	learning outcomes. Show evidence of knowledge to most familiar situations. A Demonstrate partial but limited comma outcomes. Show evidence of some or Show limited ability to apply knowled presentational skills.  Demonstrate little or no evidence of coutcomes. Lack of analytical and critical knowledge to solve problems. Organizated course	command of knowledge and a some analytical and critical a spply moderately effective organd of knowledge and skills responser and logical thinking, ge to solve problems. Apply command of knowledge and sal abilities, logical and coherention and presentational skills and presentational skills.	skills required for attain bilities and logical thinki anizational and presenta quired for attaining some but with limited analytic limited or barely effect skills required for attainint thinking. Show very lit	ing most of the course ing, and ability to apply titional skills.  e of the course learning cal and critical abilities. titive organizational and ing the course learning ttle or no ability to apply r ineffective.  No. of Hours
Course Teaching	D Fail Lecture-ba Activities	learning outcomes. Show evidence of knowledge to most familiar situations. A Demonstrate partial but limited comma outcomes. Show evidence of some or Show limited ability to apply knowled presentational skills.  Demonstrate little or no evidence of coutcomes. Lack of analytical and critical knowledge to solve problems. Organizated course	command of knowledge and a some analytical and critical a spply moderately effective organd of knowledge and skills responser and logical thinking, ge to solve problems. Apply command of knowledge and sal abilities, logical and coherention and presentational skills and presentational skills.	skills required for attain bilities and logical thinki anizational and presenta quired for attaining some but with limited analytic limited or barely effect skills required for attainint thinking. Show very lit	ing most of the course ing, and ability to apply tional skills.  e of the course learning all and critical abilities, tive organizational and ting the course learning ttle or no ability to apply
Course Teaching	D Fail Lecture-ba Activities Lectures Tutorials	learning outcomes. Show evidence of knowledge to most familiar situations. A Demonstrate partial but limited comma outcomes. Show evidence of some or Show limited ability to apply knowled presentational skills.  Demonstrate little or no evidence of coutcomes. Lack of analytical and critical knowledge to solve problems. Organizated course	command of knowledge and a some analytical and critical a spply moderately effective organd of knowledge and skills responser and logical thinking, ge to solve problems. Apply command of knowledge and sal abilities, logical and coherention and presentational skills and presentational skills.	skills required for attain bilities and logical thinki anizational and presenta quired for attaining some but with limited analytic limited or barely effect skills required for attainint thinking. Show very lit	ing most of the course ing, and ability to apply titional skills.  e of the course learning and critical abilities, titive organizational and ing the course learning the course learning the or no ability to apply r ineffective.  No. of Hours
Course Teaching	D Fail Lecture-ba Activities Lectures Tutorials	learning outcomes. Show evidence of knowledge to most familiar situations. A Demonstrate partial but limited comma outcomes. Show evidence of some or Show limited ability to apply knowled presentational skills.  Demonstrate little or no evidence of coutcomes. Lack of analytical and critical knowledge to solve problems. Organizated Course	command of knowledge and a some analytical and critical a spply moderately effective organd of knowledge and skills responser and logical thinking, ge to solve problems. Apply command of knowledge and sal abilities, logical and coherention and presentational skills and presentational skills.	skills required for attain bilities and logical thinki anizational and presenta quired for attaining some but with limited analytic limited or barely effect skills required for attainint thinking. Show very lit	ing most of the course ing, and ability to apply titional skills.  e of the course learning and and critical abilities, titive organizational and ing the course learning title or no ability to apply r ineffective.  No. of Hours  36
Course Teaching & Learning Activities  Assessment Methods	D Fail Lecture-ba Activities Lectures Tutorials Reading /	learning outcomes. Show evidence of knowledge to most familiar situations. A Demonstrate partial but limited comma outcomes. Show evidence of some or Show limited ability to apply knowled presentational skills.  Demonstrate little or no evidence of coutcomes. Lack of analytical and critics knowledge to solve problems. Organiza sed course  Sed study	command of knowledge and some analytical and critical a spply moderately effective organd of knowledge and skills responser and logical thinking, ge to solve problems. Apply command of knowledge and sal abilities, logical and coherention and presentational skills and presentational skills.	skills required for attain bilities and logical thinki anizational and presenta quired for attaining some but with limited analytic limited or barely effect skills required for attainint thinking. Show very lit	ing most of the course ing, and ability to apply titional skills.  e of the course learning and and critical abilities, titive organizational and ing the course learning ttle or no ability to apply r ineffective.  No. of Hours  36 12 100  Weighting in final
Course Teaching & Learning Activities  Assessment Methods	D Fail Lecture-ba Activities Lectures Tutorials Reading / Methods	learning outcomes. Show evidence of knowledge to most familiar situations. A Demonstrate partial but limited comma outcomes. Show evidence of some or Show limited ability to apply knowled presentational skills.  Demonstrate little or no evidence of coutcomes. Lack of analytical and critical knowledge to solve problems. Organizated course  Sed course  Self study	command of knowledge and some analytical and critical a spply moderately effective organd of knowledge and skills responser and logical thinking, ge to solve problems. Apply command of knowledge and sal abilities, logical and coherention and presentational skills and presentational skills.	skills required for attain bilities and logical thinki anizational and presenta quired for attaining some but with limited analytic limited or barely effect skills required for attainint thinking. Show very lit	ing most of the course ing, and ability to apply titional skills.  e of the course learning cal and critical abilities. titive organizational and ing the course learning title or no ability to apply r ineffective.  No. of Hours  36  12  100  Weighting in final course grade (%)
Course Teaching & Learning Activities  Assessment Methods	D Fail Lecture-ba Activities Lectures Tutorials Reading / Methods Assignme	learning outcomes. Show evidence of knowledge to most familiar situations. A Demonstrate partial but limited comma outcomes. Show evidence of some or Show limited ability to apply knowled presentational skills.  Demonstrate little or no evidence of coutcomes. Lack of analytical and critical knowledge to solve problems. Organizated course  Sed course  Self study	command of knowledge and some analytical and critical a spply moderately effective organd of knowledge and skills responser and logical thinking, ge to solve problems. Apply command of knowledge and sal abilities, logical and coherention and presentational skills and presentational skills.	skills required for attain bilities and logical thinki anizational and presenta quired for attaining some but with limited analytic limited or barely effect skills required for attainint thinking. Show very lit	ing most of the course ing, and ability to apply titional skills.  e of the course learning and and critical abilities. titive organizational and stille or no ability to apply r ineffective.  No. of Hours  No. of Hours  100  Weighting in final course grade (%)  30  30
Course Teaching & Learning Activities  Assessment Methods	D  Fail  Lecture-ba  Activities  Lectures  Tutorials  Reading /  Methods  Assignme  Project re  Test  Tan, P. N., T. Hastie, Prediction M. Kantaro A. Webb: \$ Shmueli, & Applicatior J. Han & M	learning outcomes. Show evidence of knowledge to most familiar situations. A Demonstrate partial but limited comma outcomes. Show evidence of some or Show limited ability to apply knowled presentational skills.  Demonstrate little or no evidence of coutcomes. Lack of analytical and critical knowledge to solve problems. Organization of coutcomes. Lack of analytical and critical knowledge to solve problems. Organization of the course sed course  Self study  Self study  Steinback, M. and Kumar, V.: Int. R. Tibshirani, & J. Friedeman: The (Springer, New York, 2008, 2nd educic Data Mining: Concepts, Modistristical Pattern Recognition (W. B., Patel, N.R. & Bruce, P.C.: Data in Microsoft Office Excel with X. Kamber: Data Mining: Concepts	pommand of knowledge and some analytical and critical a some analytical and critical a some analytical and critical a spply moderately effective org.  In of knowledge and skills received the problems. Apply of the solve problems of the solve problems. Apply of the solve problems of the solve problems. Apply of the solve problems of the solve problems. Apply of the solve problems of the solve problems of the solve problems. Apply of the solve problems of the solve problems of the solve problems. Apply of the solve problems of the solve problems. Apply of the solve problems of the solve problems of the solve problems of the solve problems of the solve problems of the solve problems of the solve problems of the solve problems of the s	skills required for attain bilities and logical thinking anizational and presenta quired for attaining some but with limited analytic limited or barely effect skills required for attainint thinking. Show very lit are minimally effective or are minimally effective of the control of the contr	ing most of the course ing, and ability to apply titional skills.  e of the course learning and and critical abilities. at and critical abilities. at an artical abilities.  No. of Hours  No. of Hours  36  12  100  Weighting in final course grade (%)  30  30  40  2006) ning, Inference, and ats, Techniques, and ats, Techniques, and ats, 2nd edition)
Course Teaching & Learning Activities  Assessment Methods and Weighting  Required/recommended reading	D  Fail  Lecture-ba  Activities  Lectures  Tutorials  Reading /  Methods  Assignme  Project re  Test  Tan, P. N., T. Hastie, Prediction M. Kantaro A. Webb: \$ Shmueli, & Applicatior J. Han & M	learning outcomes. Show evidence of knowledge to most familiar situations. A Demonstrate partial but limited comma outcomes. Show evidence of some or Show limited ability to apply knowled presentational skills.  Demonstrate little or no evidence of coutcomes. Lack of analytical and critical knowledge to solve problems. Organization of coutcomes. Lack of analytical and critical knowledge to solve problems. Organization of the coutcomes of the coutcomes. Seed course  Self study  Self study  Steinback, M. and Kumar, V.: Introduced the coutcomes of the coutcomes. The coutcomes of the coutcomes of the coutcomes of the coutcomes of the coutcomes of the coutcomes. The coutcomes of the	pommand of knowledge and some analytical and critical a some analytical and critical a some analytical and critical a spply moderately effective org.  In of knowledge and skills received the problems. Apply of the solve problems of the solve problems. Apply of the solve problems of the solve problems. Apply of the solve problems of the solve problems. Apply of the solve problems of the solve problems of the solve problems. Apply of the solve problems of the solve problems of the solve problems. Apply of the solve problems of the solve problems. Apply of the solve problems of the solve problems of the solve problems of the solve problems of the solve problems of the solve problems of the solve problems of the solve problems of the s	skills required for attain bilities and logical thinking anizational and presenta quired for attaining some but with limited analytic limited or barely effect skills required for attainint thinking. Show very lit are minimally effective or are minimally effective of the control of the contr	ing most of the course ing, and ability to apply titional skills.  e of the course learning and and critical abilities. Editive organizational and critical abilities. The course learning the course learning the course learning trine or no ability to apply rineffective.  No. of Hours  36  12  100  Weighting in final course grade (%)  30  30  40  2006)  ning, Inference, and ts, Techniques, and ts, Techniques, and ts, 2nd edition)

STAT3613 Marketing en	Academic Year	2014		
Offering Department Statistics & Actuarial Science Quota				
Course Co-ordinator	Dr C W Kwan, Statistics & Actuarial Science (cwkwan@hku.hk)			

Teachers Involved	Dr C W Kv	van, Statistics & Actuarial Science	3		
Course Objectives	This course is designed to provide an overview and practical application of trends, technology and methodology used in the marketing survey process including problem formulation, survey design, data collection and analysis, and report writing. Special emphasis will be put on statistical techniques particularly for analysing marketing data including market segmentation, market response models, consumer preference analysis and conjoint analysis. Students will analyse a variety of marketing case studies.				
Course Contents & Topics		Marketing decision models, Market response models, Survey research, Statistical methods for segmentation, Statistical methods for positioning, Statistical methods for new product design			
Course Learning Outcomes	On succes	ssful completion of the course, stu	dents should be able to:		
	1. Develop the hands-on skills of curve fitting and analyzing data with SAS procedures including PROC MODEL, PROC NLP, PROC CLUSTER, PROC FASTCLUS, PROC FACTOR, PROC MDS, PROC PRINQUAL, PROC TRANSREG, PROC LOGISTIC, PROC MDC, PROC DISCRIM and PROC CALIS. 2. Understand marketing decision models. 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.				
Pre-requisites (and Co-requisites and Impermissible combination)	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				
Offer in 2014 - 2015	Y 1st	sem	Examinatio	n Dec	
Offer in 2015 - 2016	Y				
Course Grade	A+ to F				
Grade Descriptors	A	dvanced level of extensive knowledge and skills g analytical and critical abilities and logical thinki e to a wide range of complex, familiar and unfaminal skills.	ng, with 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.				
	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	outcomes. Lack of analytical and critical	command of knowledge and skills required for a al abilities, logical and coherent thinking. Show ve ation and presentational skills are minimally effect	ery little or no ability to apply	
Course Type	Lecture-ba	ased course			
Course Teaching	Activities		Details	No. of Hours	
& Learning Activities	Lectures			36	
	Tutorials			12	
	Reading /	Self study		100	
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	
	Assignme	ents	Coursework (assignments, a class test and a group project)	50	
	Examination  One 2-hour written examination  50  Lattin J., Carroll J.D. and Green P.E.: Analysing multivariate data (Thomson)  Malhotra, Naresh: Marketing Research: An Applied Orientation (Pearson, 2010, 6th ed.)  Johnson R., Wichern D.: Applied Multivariate Statistical Analysis (Prentice Hall, 5th ed.)				
Required/recommended reading and online materials	Lattin J., C Malhotra, I Johnson R	Carroll J.D. and Green P.E.: Analys Naresh: Marketing Research: An A R., Wichern D.: Applied Multivariat	sing multivariate data (Thomson) Applied Orientation (Pearson, 2010, 6th	ed.)	

STAT3614 Business forec	STAT3614 Business forecasting (6 credits)				
Offering Department	Statistics & Actuarial Science Quota				
Course Co-ordinator	Dr R W L Wong, Statistics & Actuarial Science (rwong@hku.hk)				
Teachers Involved	Dr R W L Wong, Statistics & Actuarial Science				
Course Objectives					
Course Contents & Topics	Review of basic statistical concepts; autocorrelation analysis; evalumoving averages and smoothing methods; simple linear regression				

	time series	time series regression; the handling of seasonal cycles; decomposition methods.				
Course Learning Outcomes	On succes	ssful completion of the course, stud	ents should be able to:			
	<ol> <li>Understand data patterns and choose a suitable forecasting techniques.</li> <li>Understand forecasting methods: moving averages and smoothing methods, decomposition and winter's methods, simple and multiple linear regression.</li> <li>Develop hands-on skills of analyzing business data with computer software, EXCEL, and its add-ins functions.</li> </ol>					
Pre-requisites (and Co-requisites and Impermissible combination)	course) or Business University Not for stu statistics I,	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.				
Offer in 2014 - 2015	N		Examinat	ion		
Offer in 2015 - 2016	N					
Course Grade	A+ to F					
Grade Descriptors	A	course learning outcomes. Show strong	vanced level of extensive knowledge and skills analytical and critical abilities and logical think to a wide range of complex, familiar and unfa al skills.	sing, with 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	outcomes. Lack of analytical and critical	mmand of knowledge and skills required for a abilities, logical and coherent thinking. Show won and presentational skills are minimally effec	ery little or no ability to apply		
Course Type	Lecture-ba	ased course				
Course Teaching	Activities		Details			
& Learning Activities				No. of Hours		
<u>-</u>	Lectures			No. of Hours		
-	Lectures Tutorials					
-	Tutorials	/ Self study		36		
Assessment Methods and Weighting	Tutorials		Details	36 12		
Assessment Methods	Tutorials Reading /	•	Details  Coursework (assignments, tutorials, and a class test)	36 12 100 Weighting in final		
Assessment Methods	Tutorials Reading /	ents	Coursework (assignments,	36 12 100 Weighting in final course grade (%)		
Assessment Methods	Tutorials Reading / Methods Assignme Examinat J. E. Hank P. E. Gayı Economics	ents ion ie, D. W. Wichern, & A. G. Reitsch: nor & R. C. Kirkpatrick: Introductio s (McGraw-Hill, 1994)	Coursework (assignments, tutorials, and a class test)	36 12 100 Weighting in final course grade (%) 40 60 2009, 9th ed.)		
Assessment Methods and Weighting  Required/recommended reading	Tutorials Reading / Methods Assignme Examinat J. E. Hank P. E. Gayı Economics	ents ion ke, D. W. Wichern, & A. G. Reitsch: nor & R. C. Kirkpatrick: Introductio s (McGraw-Hill, 1994) Id & T. Bos: Introductory Business &	Coursework (assignments, tutorials, and a class test)  One 2-hour written examination  Business Forecasting (Prentice Hall, n to Time-series Modelling and Fore	36 12 100 Weighting in final course grade (%) 40 60 2009, 9th ed.)		

STAT3615 Practical mathe	matics for investment (6 credits)	Academic Year	2014		
Offering Department	Statistics & Actuarial Science Quota				
Course Co-ordinator	Prof K C Yuen, Statistics & Actuarial Science (kcyuen@hku.hk)				
Teachers Involved	Prof K C Yuen, Statistics & Actuarial Science				
Course Objectives	The main focus of this course is built on the concepts on financial these concepts are also considered.	mathematics. Practi	cal applications of		
Course Contents & Topics	This course covers: simple and compound interest; annuities certain; discounted cash flow analysis; amortization schedules and sinking funds; yield rates; bonds and related securities; practical applications such as real estate mortgage, short sales and term structure of interest rates.				
Course Learning Outcomes	On successful completion of the course, students should be able to:  1. Solve practical problems relating to annuities certain, simple and 2. Carry out discounted cash flow analysis.  3. Apply amortization schedules and sinking funds to the practical problems.	compound interest.	estate mortgage.		
Pre-requisites (and Co-requisites and	Pass in (STAT1601 Elementary statistical methods and any Univ Business statistics and any University level 2 course) or STA				

Impermissible combination)	(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.				
Offer in 2014 - 2015	Y 2n	nd sem	Examination	on May	
Offer in 2015 - 2016	Y				
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	the course learning outcomes. Show e	a broad range of knowledge and skills require vidence of analytical and critical abilities and nfamiliar situations. Apply effective organizatio	logical thinking, and ability to	
	С	learning outcomes. Show evidence of	ommand of knowledge and skills required for some analytical and critical abilities and logica pply moderately effective organizational and pi	al 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	outcomes. Lack of analytical and critical	ommand of knowledge and skills required for I abilities, logical and coherent thinking. Show tion and presentational skills are minimally effe	very little or no ability to apply	
Course Type	Lecture-b	based course			
Course Teaching	Activitie	es	Details	No. of Hours	
& Learning Activities	Lectures	S		36	
	Tutorials			12	
	Reading / Self study			100	
Assessment Methods and Weighting	Method	s	Details	Weighting in final course grade (%)	
	Assignments		Coursework (assignments, tutorials, and a class test)	25	
	Examina	ation	One 3-hour written examination	n 75	
Required/recommended reading and online materials	Broverma	S. G.: The Theory of Interest (Irwin an, S. A.: Mathematics of Investr icut, 2004, 3rd edition)	: Illinois, 2008, 3rd edition) nent and Credit (ACTEX Publicatio	ns - Mad River Books:	
Course Website	moodle.h	nku.hk			

STAT3616 Advanced SAS	programn	ning (6 credits)	Academic Year	2014		
Offering Department	Statistics	& Actuarial Science	Quota	10		
Course Co-ordinator	Prof K W	Ng, Statistics & Actuarial Science (kaing@hku.hk)				
Teachers Involved	Prof K W	Prof K W Ng, Statistics & Actuarial Science				
Course Objectives		rse aims to equip students, who have taken STAT2603, ming for automation of procedures and data processing.				
Course Contents & Topics	data sim	of SAS underlying parts. Macro programming. Advanulation, advanced data look-up techniques, modifying the grand memory.				
Course Learning Outcomes	1. Unders 2. Use th 3. Use th 4. Use SA	essful completion of the course, students should be able to stand the system of SAS and basic programming. e BY statement for parallel processing to aid automation. e output dataset without printing to OUTPUT windows for AS MACRO to develop customized and automated applic dvanced SAS programming statements and techniques to	piping idea in automa			
Pre-requisites (and Co-requisites and Impermissible combination)	science	O1 Probability and statistics I or STAT2901 Probability are strongly recommended to take STAT2603 Data ma				
Offer in 2014 - 2015	Y 2n	d sem	Examination	May		
Offer in 2015 - 2016	Υ					
Course Grade	A+ to F					
Grade Descriptors	A	Demonstrate thorough mastery at an advanced level of extensive course learning outcomes. Show strong analytical and critical abilit thought, and ability to apply knowledge to a wide range of comple effective organizational and presentational skills.	ties and logical thinking, w	th evidence of original		
	В	Demonstrate substantial command of a broad range of knowledge				

Course Website	moodle.hl	ku.hk		
Required/recommended reading and online materials	Carpenter		anced Programming for SAS 9, Third E te Guide to the SAS Macro Language.	
	Examina	tion	One 2-hour written exa	amination 50
	Assignments		Coursework (assign tutorials, and a class te	nments, est) 50
Assessment Methods and Weighting	Methods	3	Details	Weighting in final course grade (%)
	Reading / Self study			100
	Tutorials			12
a Learning Addivides	Lectures			36
Course Teaching & Learning Activities	Activitie	s	Details	No. of Hours
Course Type	Lecture-b	ased course		
	Fail	outcomes. Lack of analytical	idence of command of knowledge and skills re al and critical abilities, logical and coherent think is. Organization and presentational skills are mir	ring. Show very little or no ability to apply
	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 abiliti Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational apresentational skills.		
	С	learning outcomes. Show e	ncomplete command of knowledge and skills re evidence of some analytical and critical abilities situations. Apply moderately effective organization	and logical thinking, and ability to apply
			nes. Show evidence of analytical and critical ab and some unfamiliar situations. Apply effective of	

STAT3617 Sample survey	illetilous (	· · · · · · · · · · · · · · · · · · ·				
Offering Department	Statistics	& Actuarial Science	Quota			
Course Co-ordinator	Ms O T K	Choi, Statistics & Actuarial Science (ochoi@hku.hk)				
Teachers Involved	Ms O T K Choi, Statistics & Actuarial Science Prof F W H Ho, Statistics & Actuarial Science					
Course Objectives	This course will cover design and implementation of sample surveys and analysis of statistical data thur obtained. Survey design includes overall survey design, design of sampling schemes and questionnaires etc. Sampling methods include sample size determination, sampling and non-sampling errors and biases methods of estimation of parameters from survey data, imputation for missing data etc.					
Course Contents & Topics	managem simple rai sample s errors and methods	Topics may include: survey design and planning; survey quality and ethics; implementation matters like management of survey staff, respondent relationship and logistical issues; and sampling methods like simple random sampling, systematic sampling, stratified sampling, cluster sampling, multi-stage sampling sample size determination, post-stratification, ratio and regression estimation methods, non-sampling errors and biases, non-responses and missing data. Case studies of major applications of sample survey methods in the public and private sectors, with some examples on the analysis and application of the statistical data thus produced, will be discussed.				
Course Learning Outcomes	On successful completion of the course, students should be able to:  1. Demonstrate knowledge and understanding of the various steps to be taken in the planning an implementation of sample surveys.  2. Design different sample schemes and select the most efficient and suitable one for adoption for particular survey - make statistical inference on parameters based on a sample.					
	implemen 2. Desigr particular	station of sample surveys.  In different sample schemes and select the most eff	icient and suitable one sed on a sample.			
(and Co-requisites and	implemen 2. Design particular 3. Judge Pass or a University course), o and statis	station of sample surveys.  In different sample schemes and select the most eff survey - make statistical inference on parameters base.	icient and suitable one sed on a sample. s are trustworthy.  V1280 Analysis of econotical methods and any relevel 2 course), or STA	for adoption for a mic data and an University level 2 T2601 Probabilit		
(and Co-requisites and Impermissible combination)	implement 2. Design particular 3. Judge Pass or a University course), and statis Probabilit	station of sample surveys.  In different sample schemes and select the most efficiency - make statistical inference on parameters basewhether the statistics presented by other survey taker already enrolled in: BIOL2102 Biostatistics, or (ECOI) relevel 2 course), or (STAT1601 Elementary statistics or (STAT1602 Business statistics and any University stics I, or (STAT1603 Introductory statistics and any	icient and suitable one sed on a sample. s are trustworthy.  V1280 Analysis of econotical methods and any relevel 2 course), or STA	for adoption for a mic data and an University level 2 T2601 Probabilit		
(and Co-requisites and Impermissible combination) Offer in 2014 - 2015	implement 2. Design particular 3. Judge Pass or a University course), and statis Probabilit	station of sample surveys.  In different sample schemes and select the most efficiency - make statistical inference on parameters basewhether the statistics presented by other survey taker already enrolled in: BIOL2102 Biostatistics, or (ECOI / level 2 course), or (STAT1601 Elementary statistics or (STAT1602 Business statistics and any University statis I, or (STAT1603 Introductory statistics and any y and statistics: foundations of actuarial science.	icient and suitable one sed on a sample. s are trustworthy.  N1280 Analysis of econotical methods and any level 2 course), or STA University level 2 course.	for adoption for a mic data and an University level 2 T2601 Probabilit se), or STAT290		
(and Co-requisites and Impermissible combination)  Offer in 2014 - 2015  Offer in 2015 - 2016	implement 2. Design particular 3. Judge Pass or a University course), of and statis Probability 2 2nd	station of sample surveys.  In different sample schemes and select the most efficiency - make statistical inference on parameters basewhether the statistics presented by other survey taker already enrolled in: BIOL2102 Biostatistics, or (ECOI / level 2 course), or (STAT1601 Elementary statistics or (STAT1602 Business statistics and any University statis I, or (STAT1603 Introductory statistics and any y and statistics: foundations of actuarial science.	icient and suitable one sed on a sample. s are trustworthy.  N1280 Analysis of econotical methods and any level 2 course), or STA University level 2 course.	for adoption for a mic data and an University level 2 T2601 Probabilit se), or STAT290		
(and Co-requisites and Impermissible combination)  Offer in 2014 - 2015  Offer in 2015 - 2016  Course Grade	implement 2. Design particular 3. Judge 1. Pass or a University course), and statis Probability 2 2nd Y	station of sample surveys.  In different sample schemes and select the most efficiency - make statistical inference on parameters basewhether the statistics presented by other survey taker already enrolled in: BIOL2102 Biostatistics, or (ECOI / level 2 course), or (STAT1601 Elementary statistics or (STAT1602 Business statistics and any University statis I, or (STAT1603 Introductory statistics and any y and statistics: foundations of actuarial science.	icient and suitable one sed on a sample. s are trustworthy.  N1280 Analysis of econotical methods and any relevel 2 course), or STA vuniversity level 2 course.  Examination  ive knowledge and skills require abilities and logical thinking, wi	for adoption for a mic data and an University level 2.T2601 Probabilities), or STAT290  May		
(and Co-requisites and Impermissible combination)  Offer in 2014 - 2015  Offer in 2015 - 2016  Course Grade	implement 2. Design particular 3. Judge Pass or a University course), of and statis Probability 2 2nd Y  A+ to F	n different sample surveys. In different sample schemes and select the most eff survey - make statistical inference on parameters bas whether the statistics presented by other survey taker already enrolled in: BIOL2102 Biostatistics, or (ECOI / level 2 course), or (STAT1601 Elementary statistics or (STAT1602 Business statistics and any University stics I, or (STAT1603 Introductory statistics and any y and statistics: foundations of actuarial science.  It is more than the survey of the survey at an advanced level of extensions to be survey as a survey at an advanced level of extensions to be survey as a survey at an advanced level of extensions to be survey as a survey a	icient and suitable one sed on a sample. s are trustworthy.  N1280 Analysis of economic of the second and any relevel 2 course), or STA values of the second	for adoption for a mic data and an University level 2.T2601 Probabilities), or STAT290  May  May  ed for attaining all the the evidence of original truations. Apply highly taining at least most on hinking, and ability to		
Pre-requisites (and Co-requisites and Impermissible combination)  Offer in 2014 - 2015  Offer in 2015 - 2016  Course Grade  Grade Descriptors	implement 2. Design particular 3. Judge Pass or a University course), and statis Probabilit Y 2nd Y A+ to F	tation of sample surveys.  In different sample schemes and select the most eff survey - make statistical inference on parameters bas whether the statistics presented by other survey taker already enrolled in: BIOL2102 Biostatistics, or (ECOI or (STAT1602 Business statistics and any University statis or (STAT1602 Business statistics and any University stics I, or (STAT1603 Introductory statistics and any y and statistics: foundations of actuarial science.  In the statistics of section of the statistics and any y and statistics and any y and statistics: foundations of actuarial science.  In the statistics of section of the statistics and any y and statistics and any y and statistics: foundations of actuarial science.  In the statistics of the statistics and any y and statistics and any y and statistics and any y and statistics: foundations of actuarial science.  In the statistics of the statistics and any university and statistics and any y and statistics and any y and statistics and any university and any university and any university and university and university and university and university and university and university and university and university and university and university and university and university and university and university and university and university and univ	icient and suitable one sed on a sample. s are trustworthy.  N1280 Analysis of econotical methods and any r level 2 course), or STA v University level 2 course  Examination  Examination  ive knowledge and skills require abilities and logical thinking, wind critical abilities and logical and and skills required for attain received and skills required for attaining and skills and skills and skills and skills and skills and skills and skills and skills and skills and skills and sk	for adoption for a mic data and an University level 2, T2601 Probabilities), or STAT290  May  May  ed for attaining all the evidence of original trustions. Apply highly aining at least most on hinking, and ability to oresentational skills.  g most of the course g, and ability to apply and applied to a poly and applied to a poly and applied to a poly and ability to apply and ability and ability to apply and ability		

		presentational skills.			
	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. Organization and presentational skills are minimally effective or ineffective.			
Course Type	Lecture-b	Lecture-based course			
Course Teaching & Learning Activities	Activitie	es Details	No. of Hours		
& Learning Activities	Lectures	3	36		
	Tutorials	3	12		
	Reading	/ Self study	100		
Assessment Methods and Weighting	Methods	S Details	Weighting in final course grade (%)		
	Assignm	Coursework (assignments, tutorials, and a class test)	25		
	Examina	otion One 2-hour written examination	75		
Required/recommended reading and online materials	S. L. Lohr: Sampling: Design and Analysis, 2nd edition (Duxbury Press, 2010) R. L. Scheaffer, W. Mendenhall, & R. L. Ott: Elementary Survey Sampling (Duxbury Press, 2011, 7 edition) W. G. Cochran: Sampling Techniques (John Wiley & Sons Ltd., 1997) R. M. Groves, F. J. Fowler, M. P. Couper, J. M. Lepkowski, E. Singer, R. Tourangeau: Surve Methodology (John Wiley & Sons Ltd., 2009, 2nd edition) L. Kish: Survey Sampling (John Wiley & Sons, Inc., 1995) P. Salant & D. A. Dillman: How to Conduct Your Own Survey (John Wiley & Sons, Inc., 1994)				
Course Website	moodle.h	ku.hk			

· · · · · · · · · · · ·	l risk mana	gement (6 credits)	Academic Year	2014	
Offering Department	Statistics 8	& Actuarial Science	Quota		
Course Co-ordinator	Dr R W L	Wong, Statistics & Actuarial Science (rwong@hku.hk)			
eachers Involved	Dr R W L	Wong, Statistics & Actuarial Science			
Course Objectives	types of de derivatives basic idea	Nowadays all risk managers must be well versed in the use and valuation of derivatives. The two bas types of derivatives are forwards (having a linear payoff) and options (having a non-linear payoff). All oth derivatives can be decomposed to these underlying payoffs or alternatively they are variations on the basic ideas. This course aims at demonstrating the practical use of financial derivative in rismanagement. Emphases are on pricing and hedging strategies, and the concept of no-arbitrage.			
Course Contents & Topics	pricing of parity; valuand Amer interpretat	Review of futures, forwards and options and the concept of no arbitrage; hedging strategies using future pricing of forward and futures; interest rate futures and swaps; trading strategies using options; put-caparity; valuation of Europea and American options using the binomial-tree model; valuation of Europea and American options using the Black-Scholes option pricing model; the Greeks: their calculation ar interpretation; implied volatility; delta hedging and the role of market-makers; exotic options: Asian option barrier options, compound options, gap options and exchange options.			
Course Learning Outcomes	On succes	ssful completion of the course, students should be able t	o:		
	<ol> <li>Determ formula.</li> <li>Explain</li> </ol>	ure, forwards, options and swaps to formulate financial sine the payoff and the value of various derivative produthow derivative products can be used as tools to managize how to decompose complicated derivatives into a pr	cts using binomial tree e financial risk.		
Pre-requisites	Page in ST	FATOCAE Departured month amorting for increasing and			
and Co-requisites and	Not for BS Not for sto course; an Not for sto enrolled in	FAT3615 Practical mathematics for investment; and ic(Actuarial Science) students; and udents who have passed in STAT3910 Financial econoid udents who have passed in STAT3905 Introduction to this course; and idents who have passed in FINA2322 Derivatives, or ha	o financial derivatives	or have alread	
and Co-requisites and mpermissible combination)	Not for BS Not for stucourse; ar Not for stuenrolled in Not for stu	c(Actuarial Science) students; and udents who have passed in STAT3910 Financial econord udents who have passed in STAT3905 Introduction to this course; and	o financial derivatives	or have alread	
and Co-requisites and mpermissible combination)  Offer in 2014 - 2015	Not for BS Not for stucourse; ar Not for stuenrolled in Not for stu	c(Actuarial Science) students; and udents who have passed in STAT3910 Financial econold udents who have passed in STAT3905 Introduction to this course; and idents who have passed in FINA2322 Derivatives, or ha	o financial derivatives,	or have alreadhis course.	
and Co-requisites and mpermissible combination)  Offer in 2014 - 2015  Offer in 2015 - 2016	Not for BS Not for str course; ar Not for st enrolled in Not for stu	c(Actuarial Science) students; and udents who have passed in STAT3910 Financial econold udents who have passed in STAT3905 Introduction to this course; and idents who have passed in FINA2322 Derivatives, or ha	o financial derivatives,	or have alreadhis course.	
Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade Grade Descriptors	Not for BS Not for sti course; ar Not for st enrolled in Not for stu Y 1st	c(Actuarial Science) students; and udents who have passed in STAT3910 Financial econold udents who have passed in STAT3905 Introduction to this course; and idents who have passed in FINA2322 Derivatives, or ha	o financial derivatives, ve already enrolled in t  Examination  knowledge and skills requirities and logical thinking, with	or have alreadhis course.  Dec  def for attaining all the evidence of original to the evidence of the evidence of original to the evidence original to the evidence original to the evidence original to the evidence original to the evidence original to the evidence original to the evidence original to the evide	
and Co-requisites and mpermissible combination)  Offer in 2014 - 2015  Offer in 2015 - 2016  Course Grade	Not for BS Not for str course; ar Not for str enrolled in Not for str Y 1st Y A+ to F	ic(Actuarial Science) students; and udents who have passed in STAT3910 Financial econord udents who have passed in STAT3905 Introduction to this course; and idents who have passed in FINA2322 Derivatives, or has sem  Demonstrate thorough mastery at an advanced level of extensive course learning outcomes. Show strong analytical and critical abil thought, and ability to apply knowledge to a wide range of complexity.	o financial derivatives, ve already enrolled in t  Examination  knowledge and skills requirities and logical thinking, with ex, familiar and unfamiliar si e and skills required for attactritical abilities and logical the second state of the second	or have alreaded his course.  Dec  defor attaining all the evidence of originatuations. Apply highlining at least most chinking, and ability the course of t	
ond Co-requisites and mpermissible combination)  Offer in 2014 - 2015  Offer in 2015 - 2016  Course Grade	Not for BS Not for str course; ar Not for str enrolled in Not for str Y 1st Y A+ to F	cic(Actuarial Science) students; and udents who have passed in STAT3910 Financial econolid udents who have passed in STAT3905 Introduction to this course; and idents who have passed in FINA2322 Derivatives, or has sem  Demonstrate thorough mastery at an advanced level of extensive course learning outcomes. Show strong analytical and critical abilithought, and ability to apply knowledge to a wide range of completifective organizational and presentational skills.  Demonstrate substantial command of a broad range of knowledge the course learning outcomes. Show evidence of analytical and	o financial derivatives, ve already enrolled in t  Examination  knowledge and skills requirities and logical thinking, with ex, familiar and unfamiliar si e and skills required for attactritical abilities and logical ti	or have alreading all the evidence of originat tuations. Apply highlining at least most chinking, and ability to resentational skills.	

	Fail	outcomes. Lack of analytical	dence of command of knowledge and skills required for I and critical abilities, logical and coherent thinking. Show s. Organization and presentational skills are minimally effe	very little or no ability to apply	
Course Type	Lecture-based course				
Course Teaching & Learning Activities	Activitie	)S	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 (%)	
	Assignm	ients	Coursework (assignments, tutorials, and a class test)	25	
	Examina	ation	One 2-hour written examination	n 75	
Required/recommended reading and online materials	11, 13, 17 McDonald	7-18, 24. d, R. L.: Derivatives Marke	Other Derivatives (Prentice Hall, 2009, 7th edets (Addison Wesley, 2006, 2nd edition), Chapt inancial Institutions (Pearson Higher Education	ers 1-2, 4-5, 7-14, 23.	
Course Website	moodle.h	ku.hk			

STAT3620 Modern nonpa	rametric st	tatistics (6 credits)		Academic Year	2014	
Offering Department	Statistics	& Actuarial Science		Quota		
Course Co-ordinator	Dr P L H	Yu, Statistics & Actuarial Science (p	olhyu @hku.hk)			
Teachers Involved	Dr P L H	Yu, Department of Statistics and Ac	tuarial Science			
Course Objectives		rse aims to acquaint students with a nonparametric statistical methods for		c properties and us	e of classical and	
Course Contents & Topics	independ	may include: order-statistics; goo lent samples; tests for designed exp and bootstrapping methods; nonpar	periments; permutation			
Course Learning Outcomes	Identify     Perform     Gain a nonparar	On successful completion of the course, students should be able to:  1. Identify appropriate nonparametric methods for analyzing data. 2. Perform a variety of nonparametric statistical analyses. 3. Gain a working proficiency in the use of statistical software for data management and performing b nonparametric statistical analyses. 4. Effectively communicate findings and conclusions.				
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in S	STAT2602 Probability and statistics I	I			
Offer in 2014 - 2015	Y 1s	t sem		Examination	Dec	
Offer in 2015 - 2016	Y			'	'	
Course Grade	A+ to F					
	A	Demonstrate thorough mastery at an ad course learning outcomes. Show strong thought, and ability to apply knowledge effective organizational and presentation.	analytical and critical abilities to a wide range of complex, al skills.	s and logical thinking, wit familiar and unfamiliar si	th evidence of original ituations. Apply highly	
		course learning outcomes. Show strong thought, and ability to apply knowledge	analytical and critical abilities to a wide range of complex, al skills. broad range of knowledge a ridence of analytical and criti	s and logical thinking, wit familiar and unfamiliar si and skills required for atta cal abilities and logical t	th evidence of original ituations. Apply highly alining at least most of hinking, and ability to	
	A	course learning outcomes. Show strong thought, and ability to apply knowledge effective organizational and presentation.  Demonstrate substantial command of a the course learning outcomes. Show every course the strong s	analytical and critical abilities to a wide range of complex, al skills. broad range of knowledge a ridence of analytical and critifamiliar situations. Apply efferommand of knowledge and some analytical and critical abome analytical and critical abilities and	s and logical thinking, with familiar and unfamiliar sinn d skills required for attactal abilities and logical totive organizational and pkills required for attainin silities and logical thinkin and logical thinkin	th evidence of original truations. Apply high! sining at least most of hinking, and ability to presentational skills.  g most of the course g, and ability to apply g, and ability to apply g.	
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Grade Descriptors	A B C D	course learning outcomes. Show strong thought, and ability to apply knowledge effective organizational and presentation.  Demonstrate substantial command of a the course learning outcomes. Show evapply knowledge to familiar and some ur.  Demonstrate general but incomplete colearning outcomes. Show evidence of sknowledge to most familiar situations. Applemonstrate partial but limited comman outcomes. Show evidence of some colemon Show limited ability to apply knowledge presentational skills.  Demonstrate little or no evidence of colutcomes. Lack of analytical and critical	analytical and critical abilities to a wide range of complex, al skills. broad range of knowledge a ridence of analytical and critinfamiliar situations. Apply effeormand of knowledge and some analytical and critical aboply moderately effective organd of knowledge and skills requerent and logical thinking, be to solve problems. Apply	s and logical thinking, with familiar and unfamiliar sind skills required for attacal abilities and logical totive organizational and pkills required for attaining illities and logical thinkin nizational and presentation uired for attaining some but with limited analytical limited or barely effectivitils required for attaining thinking. Show very little familiar and unfamiliar thinking. Show very little familiar and unfamiliar and unfami	th evidence of original ituations. Apply highly aining at least most of hinking, and ability to presentational skills. g most of the course g, and ability to apply onal skills. of the course learning I and critical abilities re organizational and g the course learning e or no ability to apply a point of the course learning t	
Course Type	A B C D	course learning outcomes. Show strong thought, and ability to apply knowledge effective organizational and presentation.  Demonstrate substantial command of a the course learning outcomes. Show evapply knowledge to familiar and some ur.  Demonstrate general but incomplete colearning outcomes. Show evidence of sknowledge to most familiar situations. App.  Demonstrate partial but limited comman outcomes. Show evidence of some coles Show limited ability to apply knowledge presentational skills.  Demonstrate little or no evidence of colucomes. Lack of analytical and critical knowledge to solve problems. Organizationals skills.	analytical and critical abilities to a wide range of complex, al skills. broad range of knowledge a ridence of analytical and critinfamiliar situations. Apply effeormand of knowledge and some analytical and critical aboply moderately effective organd of knowledge and skills requerent and logical thinking, be to solve problems. Apply	s and logical thinking, with familiar and unfamiliar sind skills required for attacal abilities and logical totive organizational and pkills required for attaining illities and logical thinkin nizational and presentation uired for attaining some but with limited analytical limited or barely effectivitils required for attaining thinking. Show very little familiar and unfamiliar thinking. Show very little familiar and unfamiliar and unfami	th evidence of original ituations. Apply highly aining at least most of hinking, and ability to presentational skills. g most of the course g, and ability to apply onal skills. of the course learning I and critical abilities we organizational and g the course learning e or no ability to apply the course learning the course l	
Course Type	A B C D Fail	course learning outcomes. Show strong thought, and ability to apply knowledge effective organizational and presentation.  Demonstrate substantial command of a the course learning outcomes. Show evapply knowledge to familiar and some ur.  Demonstrate general but incomplete colearning outcomes. Show evidence of sknowledge to most familiar situations. Ap.  Demonstrate partial but limited comman outcomes. Show evidence of some cof Show limited ability to apply knowledge presentational skills.  Demonstrate little or no evidence of co outcomes. Lack of analytical and critical knowledge to solve problems. Organizationased course	analytical and critical abilities to a wide range of complex, al skills. broad range of knowledge a ridence of analytical and critifamiliar situations. Apply efferomand of knowledge and some analytical and critical ability moderately effective organd of knowledge and skills requerent and logical thinking, be to solve problems. Apply mand of knowledge and sl abilities, logical and coherent on and presentational skills a	s and logical thinking, with familiar and unfamiliar sind skills required for attacal abilities and logical totive organizational and pkills required for attaining illities and logical thinkin nizational and presentation uired for attaining some but with limited analytical limited or barely effectivitils required for attaining thinking. Show very little familiar and unfamiliar thinking. Show very little familiar and unfamiliar and unfami	th evidence of original ituations. Apply highly aining at least most of hinking, and ability to presentational skills.  It is g most of the course g, and ability to applonal skills.  It is of the course learning and critical abilities are organizational and g the course learning or no ability to applineffective.	
	A B C D Fail Lecture-t	course learning outcomes. Show strong thought, and ability to apply knowledge effective organizational and presentation.  Demonstrate substantial command of a the course learning outcomes. Show evapply knowledge to familiar and some ur.  Demonstrate general but incomplete colearning outcomes. Show evidence of sknowledge to most familiar situations. Ap.  Demonstrate partial but limited comman outcomes. Show evidence of some cof Show limited ability to apply knowledge presentational skills.  Demonstrate little or no evidence of co outcomes. Lack of analytical and critical knowledge to solve problems. Organizational skills.	analytical and critical abilities to a wide range of complex, al skills. broad range of knowledge a ridence of analytical and critifamiliar situations. Apply efferomand of knowledge and some analytical and critical ability moderately effective organd of knowledge and skills requerent and logical thinking, be to solve problems. Apply mand of knowledge and sl abilities, logical and coherent on and presentational skills a	s and logical thinking, with familiar and unfamiliar sind skills required for attacal abilities and logical totive organizational and pkills required for attaining illities and logical thinkin nizational and presentation uired for attaining some but with limited analytical limited or barely effectivitils required for attaining thinking. Show very little familiar and unfamiliar thinking. Show very little familiar and unfamiliar and unfami	th evidence of original traditions. Apply highly aining at least most of hinking, and ability to presentational skills.  If most of the course, and ability to apply onal skills.  If the course learning and critical abilities we organizational and critical abilities we organizational and general traditional and critical abilities we organizational and general traditional and critical abilities we organizational and general traditional and prince or no ability to apply ineffective.  No. of Hour	
Course Type	A B C D Fail Lecture-t Activitie Lectures Tutorials	course learning outcomes. Show strong thought, and ability to apply knowledge effective organizational and presentation.  Demonstrate substantial command of a the course learning outcomes. Show evapply knowledge to familiar and some ur.  Demonstrate general but incomplete colearning outcomes. Show evidence of sknowledge to most familiar situations. Ap.  Demonstrate partial but limited comman outcomes. Show evidence of some cof Show limited ability to apply knowledge presentational skills.  Demonstrate little or no evidence of co outcomes. Lack of analytical and critical knowledge to solve problems. Organizational skills.	analytical and critical abilities to a wide range of complex, al skills. broad range of knowledge a ridence of analytical and critifamiliar situations. Apply efferomand of knowledge and some analytical and critical ability moderately effective organd of knowledge and skills requerent and logical thinking, be to solve problems. Apply mand of knowledge and sl abilities, logical and coherent on and presentational skills a	s and logical thinking, with familiar and unfamiliar sind skills required for attacal abilities and logical totive organizational and pkills required for attaining illities and logical thinkin nizational and presentation uired for attaining some but with limited analytical limited or barely effectivitils required for attaining thinking. Show very little familiar and unfamiliar thinking. Show very little familiar and unfamiliar and unfami	th evidence of original truations. Apply highly aining at least most of hinking, and ability to presentational skills.  If you have the course of the course of the course learning and ability to apply onal skills.  If the course learning and critical abilities we organizational and get the course learning of the course learning or or no ability to apply the course learning of the course learning of the course learning or or no ability to apply the frective.  In the course learning of the course learning or or no ability to apply the frective.	

	Assignments	Coursework (assignments, tutorials and a class test)	25
	Examination	One 2-hour written examination	75
Required/recommended reading and online materials	Higgins, James: Introduction to Modern Not Hollander, M. and Wolfe, D.A.: Nonparame Gibbons, J.D. and Chakraborti, S.: Nonpara Kvam, P.H. and Vidakovic, B.: Nonparam (Wiley, 2007)	tric Statistical Methods, 2nd edition (Wiley, ametric Statistical Inference, 5th edition (C	, 1999) RC press, 2010)
Course Website	moodle.hku.hk		

STAT3621 Statistical data	analysis (6	credits)	Academic Ye	ar 2014		
Offering Department	Statistics 8	& Actuarial Science	Quota	10		
Course Co-ordinator	Dr G Tian,	Statistics & Actuarial Science (gltian	@hku.hk)			
Teachers Involved	Dr G Tian,	Statistics & Actuarial Science				
Course Objectives	Building on prior coursework in statistical methods and modeling, students will get a deeper understanding of the entire process of data analysis. The course aims to develop skills of model selection and hypotheses formulation so that questions of interest can be properly formulated and answered. A important element deals with model review and improvement, when one's first attempt does not adequately fit the data. Students will learn how to explore the data, to build reliable models, and to communicate the results of data analysis to a variety of audiences.					
Course Contents & Topics	and two-sa variable so higher-way regression Real data	ample case using parametric and no election and model diagnostic check y ANOVA; Covariance analysis; Cate i. sets will be presented for modelling	ation of data; Simple statistical analyse imparametric methods; Regression and king; Analysis of Variance (ANOVA): egorical and count data: binary logistic and analysis using statistical software	alyses: model fitting; 1-way, two-way and regression, Poisson		
	experience					
Course Learning Outcomes	On succes	ssful completion of the course, studen	its snould be able to:			
	2. Summa measures, 3. Identify 4. Carry o selection,	rize and describe the quantitative and the association among several continuted the appropriate and comprehensive s	tatistical analyses based on real life late testable hypotheses, make ap	appropriate statistical		
Pre-requisites (and Co-requisites and Impermissible combination)		Linear statistical analysis or STAT39 are strongly recommended to take \$	207 Linear models and forecasting STAT2603 Data management with SA	S prior to taking this		
Offer in 2014 - 2015	Y 2nd	sem	Examination	May		
Offer in 2015 - 2016	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-ba	ased course				
Course Teaching	Activities	<u> </u>	Details	No. of Hours		
& Learning Activities	Lectures			36		
	Tutorials			12		
	Reading /	Self study		100		
Assessment Methods and Weighting	Methods	·	Details	Weighting in fina course grade (%)		
	Assignme	ents	Coursework (assignments and a class test)	50		

Required/recommended reading and online materials	Ramsey, F. and Schafer, D. (2012). The Statistical Sleuth: A Course in Methods of Data Analysis, 3rd edition, Cengage Learning. Cody, R. (2011). SAS Statistics by Example. SAS Institute. Cody, R.P. & Smith, J.K. (2005). Applied Statistics and the SAS Programming Language, 5th edition, Pearson. Elliott, R.J. (2009). Learning SAS in the Computer Lab, 3rd edition, Cengage Learning. Kleinbaum, D.G., Kupper, L.L., Nizam, A. and Muller, K.E. (2007). Applied Regression Analysis and Other Multivariable Methods. 4th edition, Cengage Learning.
Course Website	moodle.hku.hk

STAT3799 Directed stu	u.00 010	atistics (o credits)		Academic Year		
Offering Department	Statistics	& Actuarial Science		Quota	30	
Course Co-ordinator	Prof S M	S Lee, Statistics & Actuarial Science (sms/	lee @hku.hk)			
Teachers Involved	Various to	eachers as the assessors of oral presentati	ions and written reports,	Statistics & Actu	arial Science	
Course Objectives	To enhar skills.	To enhance students' knowledge of a particular topic and students' self-directed learning and critical thinking skills.				
Course Contents & Topics	member. be a critic	ne student undertakes a self-managed study on a topic in statistics under the supervision of a staf ember. The topic is preferably one not sufficiently covered in the regular curriculum. The directed study ca e a critical review or a synthesis of published work on the subject, or a laboratory or field study that woul shance students' understanding of the subject. The project may not require an element of originality.				
Course Learning Outcomes	On succe	essful completion of the course, students sh	nould be able to:			
	<ol> <li>Develor</li> <li>statistical</li> <li>Write s</li> </ol>	rst-hand experience in solving a research of skills in important technical tools, includ research and data analyses. Succinct reports on the findings of a research oral presentation of the findings of a	ding the use of computer ch study.			
Pre-requisites (and Co-requisites and Impermissible combination)	STAT6XX Pass in 1 Probabilit STAT160 STAT290 Not for st This caps	at least 24 credits of advanced level XX) in the Major in Risk Management / Stat 8 credits from: STAT1601 Elementary stat by and statistics I, STAT2602 Probability and Introductory statistics, STAT2605 Introductory statistics; foundations of undents who have already enrolled in STAT stone course is for Risk Management, ar tor is required.	tistics; and itistical methods, STAT16 and statistics II, STAT26 oduction to demographi actuarial science, STAT2 4799 Statistics project in	602 Business sta 603 Data manag c and socio-ecc 2902 Financial m this academic ye	utistics, STAT260 gement with SAS conomic statistics athematics; and ear.	
Offer in 2014 - 2015	N		ı	Examination		
Offer in 2015 - 2016	Υ					
Course Grade	A+ to F					
	A+ to F	Demonstrate thorough grasp of the subject. Show of original thought. Insightful use and critical are sources and to quote/reference aptly. Critical use highly effective organizational and presentationa that is required in wider areas relevant to the topic	alysis / evaluation of information of data and results to draw appal skills. [Work of A+ should shou	on drawn from a full propriate and insight	range of high quality ful conclusions. Apply	
Course Grade Grade Descriptors		of original thought. Insightful use and critical and sources and to quote/reference aptly. Critical use highly effective organizational and presentational	alysis / evaluation of information of data and results to draw applat skills. [Work of A+ should shot.]  vidence of analytical and critical ability to make meaningful oc	on drawn from a full propriate and insight how considerable ad al abilities and logical omparisons between	range of high quality ful conclusions. Apply Iditional work beyond I thinking. Critical use In different secondary	
	A	of original thought. Insightful use and critical and sources and to quote/reference aptly. Critical use highly effective organizational and presentationa that is required in wider areas relevant to the topic Demonstrate substantial grasp of the subject. Evor frelevant information from sources, showing interpretations and to quote/reference aptly. Co	alysis / evaluation of informatic of data and results to draw app in skills. [Work of A+ should shot.]  idence of analytical and critical ability to make meaningful correct use of data of results in subject. Evidence of some is, showing ability to make comsome erroneous use of data an	on drawn from a full propriate and insight how considerable ad all abilities and logical omparisons between to draw appropriate analytical and critical apparisons between di	range of high quality ful conclusions. Apply Iditional work beyond I thinking. Critical use In different secondary In conclusions. Apply In abilities and logical Ifferent interpretations	
	В	of original thought. Insightful use and critical and sources and to quote/reference aptly. Critical use highly effective organizational and presentationa that is required in wider areas relevant to the topic Demonstrate substantial grasp of the subject. Ev of relevant information from sources, showing interpretations and to quote/reference aptly. Confective organizational and presentational skills. Demonstrate general but incomplete grasp of the thinking. Use of relevant information from source and to quote/reference aptly. Mostly correct but services are successful to the successful the successful and the successful the success	alysis Čevaluation of informatic of data and results to draw appla skills. [Work of A+ should st c.]  vidence of analytical and critica ability to make meaningful correct use of data of results are subject. Evidence of some some erroneous use of data an esentational skills.  entition of some relevant informalytical and critical abilities. Data analysis and comparison. Lim	on drawn from a full propriate and insight how considerable ad al abilities and logical omparisons between to draw appropriate analytical and critical aparisons between did results to draw appropriate to draw appropriate analytical and critical aparisons between did results to draw appropriate to draw appropriate to draw appropriate to draw appropriate to draw appropriate to the subject ability to use daily to use daily to use daily the did ability to use daily and interest and int	range of high quality ful conclusions. Apply Iditional work beyond I thinking. Critical use a different secondary e conclusions. Apply al abilities and logical ifferent interpretations propriate conclusions et. Evidence of some I reference of several	
	B C	of original thought. Insightful use and critical and sources and to quote/reference aptly. Critical use highly effective organizational and presentationa that is required in wider areas relevant to the topic Demonstrate substantial grasp of the subject. Ev of relevant information from sources, showing interpretations and to quote/reference aptly. Confective organizational and presentational skills.  Demonstrate general but incomplete grasp of the thinking. Use of relevant information from source and to quote/reference aptly. Mostly correct but supply moderately effective organizational and retective organizational and presentations and the partial but limited grasp, with recoherent and logical thinking, but with limited an sources, but mainly through summary rather than	alysis Čevaluation of informatic of data and results to draw appla skills. [Work of A+ should strong all skills. [Work of A+ should strong ability to make meaningful or orrect use of data of results are subject. Evidence of some standards ability to make composite to make composite to make composite to make composite to make composite to make composite to make composite to make composite to make composite to make composite to make composite to make composite to make composite to make composite to make composite to make composite to make composite to make to make the make to make the make th	on drawn from a full propriate and insight how considerable ad all abilities and logical omparisons between to draw appropriate analytical and critical parisons between did results to draw appropriate demonstrate use and inted ability to use daisentational skills.  of the subject. Evideondary sources and in a figure and in a figure and in a figure and in a figure ability to use daisentational skills.	range of high quality ful conclusions. Apply Idditional work beyond I thinking. Critical use a different secondary a conclusions. Apply all abilities and logical different interpretations propriate conclusions at Evidence of some I reference of several ta and results to draw ence of little or lack of no critical comparisor.	
Grade Descriptors	A  B  C  D	of original thought. Insightful use and critical and sources and to quote/reference aptly. Critical use highly effective organizational and presentational that is required in wider areas relevant to the topic Demonstrate substantial grasp of the subject. Even of relevant information from sources, showing interpretations and to quote/reference aptly. Ceffective organizational and presentational skills.  Demonstrate general but incomplete grasp of the thinking. Use of relevant information from source and to quote/reference aptly. Mostly correct but is apply moderately effective organizational and presentational and presentational stills.  Demonstrate partial but limited grasp, with rete coherent and logical thinking, but with limited ar sources, but mainly through summary rather than appropriate conclusions. Apply limited or barely elemonstrate evidence of little or no grasp of the analytical and critical abilities, logical and cohere of them. Misuse of data and results and/or unable	alysis Čevaluation of informatic of data and results to draw appla skills. [Work of A+ should strong all skills. [Work of A+ should strong ability to make meaningful or orrect use of data of results are subject. Evidence of some standards ability to make composite to make composite to make composite to make composite to make composite to make composite to make composite to make composite to make composite to make composite to make composite to make composite to make composite to make composite to make composite to make composite to make composite to make to make the make to make the make th	on drawn from a full propriate and insight how considerable ad all abilities and logical omparisons between to draw appropriate analytical and critical parisons between did results to draw appropriate demonstrate use and inted ability to use daisentational skills.  of the subject. Evideondary sources and in a figure and in a figure and in a figure and in a figure ability to use daisentational skills.	range of high quality ful conclusions. Apply Iditional work beyond I thinking. Critical use a different secondary a conclusions. Apply all abilities and logical different interpretations propriate conclusions. At Evidence of some I reference of several ta and results to draw ence of little or lack of no critical comparison.	
Grade Descriptors  Course Type  Course Teaching	A  B  C  D	of original thought. Insightful use and critical and sources and to quote/reference aptly. Critical use highly effective organizational and presentational that is required in wider areas relevant to the topic Demonstrate substantial grasp of the subject. Evor felevant information from sources, showing interpretations and to quote/reference aptly. Confective organizational and presentational skills.  Demonstrate general but incomplete grasp of the thinking. Use of relevant information from source and to quote/reference aptly. Mostly correct but supply moderately effective organizational and presentational and presentational shills.  Demonstrate partial but limited grasp, with rete coherent and logical thinking, but with limited ar sources, but mainly through summary rather than appropriate conclusions. Apply limited or barely elemonstrate evidence of little or no grasp of the analytical and critical abilities, logical and cohere of them. Misuse of data and results and/or unable are minimally effective or ineffective.	alysis Čevaluation of informatic of data and results to draw appla skills. [Work of A+ should strong all skills. [Work of A+ should strong ability to make meaningful or orrect use of data of results are subject. Evidence of some standards ability to make composite to make composite to make composite to make composite to make composite to make composite to make composite to make composite to make composite to make composite to make composite to make composite to make composite to make composite to make composite to make composite to make composite to make to make the make to make the make th	on drawn from a full propriate and insight how considerable ad all abilities and logical omparisons between to draw appropriate analytical and critical parisons between did results to draw appropriate demonstrate use and inted ability to use daisentational skills.  of the subject. Evideondary sources and in a figure and in a figure and in a figure and in a figure ability to use daisentational skills.	range of high quality ful conclusions. Apply iditional work beyond a lithinking. Critical use of different secondary econclusions. Apply all abilities and logical ifferent interpretations propriate conclusions are treference of severa ta and results to draw ence of little or lack on or critical comparisor of presentational skills	
Grade Descriptors  Course Type  Course Teaching	B C D Fail Project-b Activitie	of original thought. Insightful use and critical and sources and to quote/reference aptly. Critical use highly effective organizational and presentational that is required in wider areas relevant to the topic Demonstrate substantial grasp of the subject. Evor felevant information from sources, showing interpretations and to quote/reference aptly. Confective organizational and presentational skills.  Demonstrate general but incomplete grasp of the thinking. Use of relevant information from source and to quote/reference aptly. Mostly correct but supply moderately effective organizational and presentational and presentational shills.  Demonstrate partial but limited grasp, with rete coherent and logical thinking, but with limited ar sources, but mainly through summary rather than appropriate conclusions. Apply limited or barely elemonstrate evidence of little or no grasp of the analytical and critical abilities, logical and cohere of them. Misuse of data and results and/or unable are minimally effective or ineffective.	alysis Čevaluation of informatic of data and results to draw appla Iskills. [Work of A+ should sf c.]  ridence of analytical and critica ability to make meaningful correct use of data of results are subject. Evidence of some is, showing ability to make comsome erroneous use of data an escentational skills.  ention of some relevant informalytical and critical abilities. Data analysis and comparison. Lim effective organizational and pretknowledge and understanding thinking. Limited use of section of data appropriate conclusion.	on drawn from a full propriate and insight how considerable ad all abilities and logical omparisons between to draw appropriate analytical and critical parisons between did dresults to draw appropriate demonstrate use and all ability to use das sentational skills.  of the subject. Evide ondary sources and ons. Organization and ons. Organization and ongs. to be	range of high quality ful conclusions. Apply ful conclusions. Apply Iditional work beyond I thinking. Critical use a different secondary a conclusions. Apply all abilities and logical ifferent interpretations propriate conclusions are conclusions and results to draw the conclusions of the conclusi	
Course Type Course Teaching & Learning Activities	B C D Fail Project-b Activitie	of original thought. Insightful use and critical and sources and to quote/reference aptly. Critical use highly effective organizational and presentational that is required in wider areas relevant to the topic Demonstrate substantial grasp of the subject. Evor felevant information from sources, showing interpretations and to quote/reference aptly. Confective organizational and presentational skills.  Demonstrate general but incomplete grasp of the thinking. Use of relevant information from source and to quote/reference aptly. Mostly correct but some Apply moderately effective organizational and presentational and presentational shills.  Demonstrate partial but limited grasp, with rete coherent and logical thinking, but with limited ar sources, but mainly through summary rather than appropriate conclusions. Apply limited or barely elemonstrate evidence of little or no grasp of the analytical and critical abilities, logical and cohere of them. Misuse of data and results and/or unable are minimally effective or ineffective.  assed course	alysis Čevaluation of informatic of data and results to draw appla skills. [Work of A+ should sf c.]  ridence of analytical and critica ability to make meaningful correct use of data of results are subject. Evidence of some is, showing ability to make compose erroneous use of data an escentational skills.  In analysis and comparison. Lim affective organizational and presults knowledge and understanding in thinking. Limited use of sect e to draw appropriate conclusion.	on drawn from a full propriate and insight how considerable ad all abilities and logical omparisons between to draw appropriate analytical and critical parisons between did results to draw appropriate use and interest of the subject emonstrate use and interest of the subject emonstrate use and interest of the subject emonstrate use and interest of the subject. Evide ondary sources and it ons. Organization and organization and organiza	range of high quality ful conclusions. Apply ful conclusions. Apply Iditional work beyond I thinking. Critical use of different secondary e conclusions. Apply al abilities and logical fiferent interpretations propriate conclusions at. Evidence of some and results to draw ence of little or lack or no critical comparisor d presentational skills  No. of Hours  120  Veighting in fina	
	B C D Fail Project-b Activitie Reading	of original thought. Insightful use and critical and sources and to quote/reference aptly. Critical use highly effective organizational and presentational that is required in wider areas relevant to the topic Demonstrate substantial grasp of the subject. Evor felevant information from sources, showing interpretations and to quote/reference aptly. Confective organizational and presentational skills.  Demonstrate general but incomplete grasp of the thinking. Use of relevant information from source and to quote/reference aptly. Mostly correct but some Apply moderately effective organizational and presentational and presentational shills.  Demonstrate partial but limited grasp, with rete coherent and logical thinking, but with limited ar sources, but mainly through summary rather than appropriate conclusions. Apply limited or barely elemonstrate evidence of little or no grasp of the analytical and critical abilities, logical and cohere of them. Misuse of data and results and/or unable are minimally effective or ineffective.  assed course	alysis Čevaluation of informatic of data and results to draw appla skills. [Work of A+ should sf c.]  ridence of analytical and critica ability to make meaningful correct use of data of results the subject. Evidence of some is, showing ability to make compose erroneous use of data an escentational skills.  International skills and comparison. Limple stills and critical abilities. Data analysis and comparison. Limple service organizational and precedent the service of	on drawn from a full propriate and insight how considerable ad al abilities and logical omparisons between to draw appropriate analytical and critical parisons between did results to draw appropriate described by the construction of the subject lemonstrate use and inted ability to use dasentational skills.  Of the subject. Evide ondary sources and ions. Organization and ons. Organization and the dent & the	range of high quality ful conclusions. Apply Iditional work beyond I thinking. Critical use a different secondary a conclusions. Apply all abilities and logical different interpretations propriate conclusions. At Evidence of some I reference of several ta and results to draw ence of little or lack of no critical comparison.	

STAT3901 Life contingen Offering Department		& Actuarial Science	Quota			
Course Co-ordinator						
Teachers Involved		Cheung, Statistics & Actuarial Science Cheung, Statistics & Actuarial Science	,			
Course Objectives			o integrate life contingencies into	a full probabilistic		
oourse objectives	framework insurances developed	framework. The time-until-death random variable is the basic building block by which models for life insurances, designed to reduce the financial impact of the random event of untimely death, are developed. This course introduces the concepts of life contingencies and the basic mathematical skills for modelling life insurance products.				
Course Contents & Topics		s include: survival distributions; life to annuity models; benefit premiums; l	table functions; select and ultimate to benefit reserves.	ables; life insurance		
Course Learning Outcomes	On succes	sful completion of the course, studen	ts should be able to:			
	variables. 2. Define to variable us 3. Define parandom variables. 5. Calculations	<ol> <li>Define the continuous survival-time random variable that arises from the discrete survival-time random variable using some assumptions for fractional ages.</li> <li>Define present-value-of-benefit random variables defined on survival-time random variables.</li> <li>Define and calculate the expected values, variances and probabilities for present-value-of-ben random variables, present-value-of-loss-at-issue random variables, and present-value-of-loss random variables.</li> </ol>				
Pre-requisites (and Co-requisites and (mpermissible combination)	(Pass in S in this cou	TAT2902 Financial mathematics and rse)) or	and STAT3615 Practical mathematics (Pass in STAT3902 Statistical model and STAT2902 Financial mathematics	s, or already enrolled		
Offer in 2014 - 2015	Y 1st	sem	Examination	Dec		
Offer in 2015 - 2016	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	Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.				
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.				
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.				
	Fail	outcomes. Lack of analytical and critical ab	nand of knowledge and skills required for atta ilities, logical and coherent thinking. Show very and presentational skills are minimally effective	little or no ability to apply		
Course Type	Lecture-ba	sed course				
Course Teaching	Activities		Details	No. of Hours		
& Learning Activities	Lectures			36		
	Tutorials			12		
	Reading /	Self study		100		
Assessment Methods and Weighting	Methods		Details	Weighting in fina course grade (%)		
	Assignme	ents	Coursework (assignments, tutorials, and a class test)	25		
	Examinat	ion	One 3-hour written examination	75		
Required/recommended	Examination  One 3-hour written examination  75  Bowers. N.L., Gerber, H.U., Hickman, J.C., Jones, D.A. & Nesbitt, C.J.: Actuarial Mathematics (1997, 2nd edition), Itasca, Illinois: The Society of Actuaries  Dickson, C.M.D., Hardy, M.R., and Waters, H.R.: Actuarial Mathematics for Life Contingent Risks					
reading and online materials	Dickson,		H.R.: Actuarial Mathematics for Li	e Contingent Risks		

STAT3902 Statistical models (6 credits)			Academic Year	2014	
Offering Department	t Statistics & Actuarial 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	further stud hypothesis will be equ	This course is on the basis of 'STAT2901 Probability and Statistics: Foundation of Actuarial Science'. It will further study the concepts and methods of statistics. The course will lay emphasis on the estimation and hypothesis testing, the two major areas of statistical inference. Through the study of this course, students will be equipped with both quantitative skills and qualitative perceptions essential for making rigorous statistical analysis of data.  Distribution and density of function of random variables: Order statistics, central limit theorem. Maximum				
Course Contents & Topics	Distribution and density of function of random variables; Order statistics, central limit theorem, Maximum likelihood estimator (MLE), moment estimator, Bayesian estimator, properties of estimators, limiting properties of MLE; Confidence interval estimations for normal mean, the difference of two normal means normal variance, the ratio of two normal variances, and large-sample confidence intervals; Power function Neyman-Pearson Lemma, likelihood ratio test, and goodness of fit test.					
Course Learning Outcomes	1. Understa point estim 2. Derive m 3. Locate p 4. Find te	sful completion of the course, students and the importance of sufficient statist ation, confidence interval estimation, an aximum likelihood estimators of paramitrotal quantity to construct confidence sting statistic to test hypotheses as with small sample sizes and non-nor	tic(s) in data reduction testing hypothesis to calculate maintervals of parametes sociated with one-s	s. aximum likelihood ers. sample and/or tv	estimates.	
Pre-requisites (and Co-requisites and Impermissible combination)		AT2901 Probability and statistics: foun ctuarial Science) students only.	dations of actuarial s	cience; and		
Offer in 2014 - 2015	Y 1st s	sem		Examination	Dec	
Offer in 2015 - 2016	Υ				ı	
Course Grade	A+ to F					
Grade Descriptors	A	Demonstrate thorough mastery at an advance course learning outcomes. Show strong analythought, and ability to apply knowledge to a effective organizational and presentational ski	tical and critical abilities a wide range of complex, fa	and logical thinking, w	ith evidence of original	
	В	Demonstrate substantial command of a broat the course learning outcomes. Show evident apply knowledge to familiar and some unfamil	ce of analytical and critica	l abilities and logical	thinking, and ability to	
	С	Demonstrate general but incomplete comma learning outcomes. Show evidence of some knowledge to most familiar situations. Apply m	analytical and critical abili-	ties and logical thinkir	ng, 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 and presentational skills.				
	Fail	Demonstrate little or no evidence of comma outcomes. Lack of analytical and critical abilit	nd of knowledge and skill	s required for attaining		
		knowledge to solve problems. Organization ar	ies, logical and coherent tl	hinking. Show very litt	le or no ability to apply	
Course Type	Lecture-ba	knowledge to solve problems. Organization ar	ies, logical and coherent tl	hinking. Show very litt	le or no ability to apply	
Course Teaching	Lecture-base	knowledge to solve problems. Organization ar	ies, logical and coherent tl	hinking. Show very litt	le or no ability to apply	
Course Teaching		knowledge to solve problems. Organization ar	ies, logical and coherent the defending presentational skills are	hinking. Show very litt	le or no ability to apply ineffective.	
Course Teaching	Activities	knowledge to solve problems. Organization ar	ies, logical and coherent the defending presentational skills are	hinking. Show very litt	e or no ability to apply ineffective.	
Course Teaching	Activities Lectures	knowledge to solve problems. Organization and sed course	ies, logical and coherent the defending presentational skills are	hinking. Show very litt	No. of Hours	
Course Type Course Teaching & Learning Activities  Assessment Methods and Weighting	Activities Lectures Tutorials	knowledge to solve problems. Organization and sed course	ies, logical and coherent the defending presentational skills are	ninking. Show very litt minimally effective or	No. of Hours  36	
Course Teaching & Learning Activities	Activities Lectures Tutorials Reading /	knowledge to solve problems. Organization and sed course  Self study	ies, logical and coherent the different presentational skills are  Details  Details	ninking. Show very litt minimally effective or	No. of Hours  No. of Hours  100  Weighting in final	
Course Teaching & Learning Activities  Assessment Methods	Activities Lectures Tutorials Reading / Methods	knowledge to solve problems. Organization are sed course  Self study	ies, logical and coherent the different presentational skills are  Details  Details  Coursework (as:	signments, s test)	No. of Hours  No. of Hours  36  12  100  Weighting in final course grade (%)	
Course Teaching & Learning Activities  Assessment Methods	Activities Lectures Tutorials Reading / Methods Assignmen Examinatin Miller I. & Internationa Hogg R. V 2005, 6th e Arnold S. F Larsen R.	knowledge to solve problems. Organization are sed course  Self study  Miller M.: John E. Freund's Mather al, 2004, 7th edition) ., McKean J. W. & Craig A. T.: Introd	Details  Details  Coursework (astutorials, and a class One 3-hour written matical Statistics with uction to Mathematical, 1990)	signments, s test) examination h Applications (Peal Statistics (Peal	No. of Hours  No. of Hours  36 12 100  Weighting in final course grade (%) 25 75  Pearson Education rson Prentice Hall,	

STAT3903 Stochastic mod	Academic Year	2014		
Offering Department	Statistics & Actuarial Science	tics & Actuarial Science Quota		
Course Co-ordinator	Dr K S Chong, Statistics & Actuarial Science (kschong@hku.hk)			
Teachers Involved	Dr K S Chong, Statistics & Actuarial Science			
Course Objectives	This is an introductory course in probability modelling. A range of im will be discussed.	portant topics in sto	chastic processes	
Course Contents & Topics	Introduction to probability theory, Conditional probability and experimodels, classification of states in a Markov chain, calculation of limit in transient states, Poisson process, distribution of interarrival distribution of the arrival time, Brownian Motion, hitting time and n	ing probabilities and time and waiting t	mean time spen ime, conditional	

		e Black-Scholes option pricing formul cess, branching process and renewal p			
Course Learning Outcomes	On succes	ssful completion of the course, students	s should be able to:		
	<ol> <li>Apply the conditioning method to calculate the mean and probability.</li> <li>Understand the essentials of Markov chains, the Poisson process, and Brownian motion.</li> <li>Understand how stochastic models can be applied to the study of real-life phenomena.</li> </ol>				
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in S  Not for st  course; ar	actuarial Science) students only; and TAT2901 Probability and statistics: four udents who have passed in MATH30 ad udents who have passed in STAT360 udents who have passed in STAT360	603 Probability theory, or have alre	,	
Offer in 2014 - 2015	Y 2nd	I sem	Examination	May	
Offer in 2015 - 2016	Υ				
Course Grade	A+ to F				
Grade Descriptors	A	course learning outcomes. Show strong anal	ted level of extensive knowledge and skills re ytical and critical abilities and logical thinking wide range of complex, familiar and unfamili ills.	, with evidence of original	
	В	the course learning outcomes. Show eviden	d range of knowledge and skills required for ce of analytical and critical abilities and logic liar situations. Apply effective organizational a	cal thinking, and ability to	
	С	learning outcomes. Show evidence of some	and of knowledge and skills required for atta analytical and critical abilities and logical thi noderately effective organizational and preser	nking, 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  Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.				
Course Type	Lecture-ba	ased course			
Course Teaching	Activities	S	Details	No. of Hours	
& Learning Activities	Lectures			36	
	Tutorials			12	
	Reading	/ Self study		100	
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	
	Assignme	ents	Coursework (assignments, tutorials, and a class test)	25	
	Examinat	tion	One 3-hour written examination	75	
Required/recommended reading and online materials	S. M. Ros	s: Introduction to Probability Models (98	th edition)		
Course Website	moodle.hk				

STAT3904 Corporate finar	nce for actuarial science (6 credits)	Academic Year	2014
Offering Department	Statistics & Actuarial Science	Quota	
Course Co-ordinator	Dr J K Woo, Statistics & Actuarial Science (jkwoo@hku.hk)		
Teachers Involved	Dr J K Woo, Statistics & Actuarial Science		
Course Objectives	This course is designed for actuarial science students to receive VE Actuaries. The objective of this course is to introduce students to th finance. The course will provide students with a systematic framewor and financing decisions for corporations.	e fundamental princi	iples of corporate
Course Contents & Topics	The first part of the course will give an introduction to corporate fina topics covered in STAT2902 and STAT3615. These include: financy value and net present value, financial instruments and dividends de theory, binomial model and Black-Scholes option pricing formula. To no some important topics of corporate finance including: capital sleverage and firm value, market efficiency, risk and return, investrivariance analysis, CAPM, long term financing, measures and preformance using various measures.	cial markets and con erivatives market, no the main part of the ructure and dividence ment decision using	mpanies; present l-arbitrage pricing course will focus d policy, financia Markowitz mean
Course Learning Outcomes	On successful completion of the course, students should be able to:  1. Understand the factors to be considered by a company when dividend policy, and also the impact of financial leverage and long/s structure.  2. Calculate the value of bonds and stocks.		
	F04		

		financial performance using variotand the mean-variance portfolio			
Pre-requisites (and Co-requisites and Impermissible combination)	[(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.				
Offer in 2014 - 2015	Y 2nd	sem		Examination	May
Offer in 2015 - 2016	Y	Υ			
Course Grade	A+ to F	A+ to F			
Grade Descriptors	A	Demonstrate thorough mastery at an course learning outcomes. Show strouthought, and ability to apply knowledgeffective organizational and presentati	ng analytical and critical abilities age to a wide range of complex, fa	and logical thinking,	with evidence of original
	В	Demonstrate substantial command of the course learning outcomes. Show apply knowledge to familiar and some	evidence of analytical and critical	al abilities and logica	I thinking, and ability to
	С	Demonstrate general but incomplete learning outcomes. Show evidence of knowledge to most familiar situations.	f some analytical and critical abili	ties and logical think	ing, 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	Demonstrate little or no evidence of outcomes. Lack of analytical and critic knowledge to solve problems. Organiz	cal abilities, logical and coherent t	hinking. Show very li	ttle or no ability to apply
Course Type	Lecture-ba	ased course			
Course Teaching	Activities	S	Details		No. of Hours
& Learning Activities	Lectures				36
	Tutorials				12
	Reading / Self study				100
Assessment Methods and Weighting	Methods	• • • • • • • • • • • • • • • • • • •	Details		Weighting in final course grade (%)
	Assignments		Coursework (as tutorials, and a class	signments, ss test)	25
	Examinat	tion	One 3-hour written	examination	75
Required/recommended reading and online materials	Ross, S. A	A., Myers S. C. and Allen, F.: Pr A., Westerfield, R. W. and Jaffe, J er, D. G.: Investment Science (19	.: Corporate Finance (2005		ition)
Course Website	moodle.hl	ku.hk			

STAT3905 Introduction to	financial d	erivatives (6 credits)	Academic Year	2014		
Offering Department	Statistics 8	Actuarial Science	Quota			
Course Co-ordinator	Dr E C K C	Cheung, Statistics & Actuarial Science (eckc@hku.hk)				
Teachers Involved	Dr E C K C	Dr E C K Cheung, Statistics & Actuarial Science				
Course Objectives		course aims at providing an understanding of the fundamental concepts of financial derivatives ases 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; spreads and collars; hedging; financial forwards and futures; commodity swaps; interest rate swaps; put-call parity.				
Course Learning Outcomes	1. Define a 2. Evaluat swaps.	esful completion of the course, students should be able to: and recognize the definitions of terms commonly used in de the payoff and profit of basic derivative contracts, inchew derivative securities can be used as tools to manage	luding forwards, futu	ires, options, a		
Pre-requisites (and Co-requisites and Impermissible combination)	For BSc(A Not for st enrolled in	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 alr enrolled in this course; and Not for students who have passed in FINA2322 Derivatives, or have already enrolled in this course.				
Offer in 2014 - 2015	Y 1st	sem	Examination	Dec		
Offer in 2015 - 2016	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.					
	В					

		apply knowledge to familiar and some unfa	miliar situations. Apply effective organizational a	and presentational skills.	
	С	learning outcomes. Show evidence of som	mand of knowledge and skills required for atta ne analytical and critical abilities and logical thi y moderately effective organizational and prese	nking, 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	Demonstrate little or no evidence of command of knowledge and skills required for attaining the coul outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ab 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	
& Learning Activities	Lectures			36	
	Tutorials			12	
	Reading / Self study			100	
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	
	Assignments		Coursework (assignments, tutorials, and a class test)	25	
	Examination		One 2-hour written examination	75	
Required/recommended reading and online materials	McDonald, R. L.: Derivatives Markets (Addison Wesley, 2006, 2nd edition), Chapters 1-5, 8.			1-5, 8.	
Course Website	moodle.l	hku.hk			

STAT3906 Risk theory I (6	credits)		Aca	ademic Year	2014	
Offering Department	Statistics	& Actuarial Science	Que	ota		
Course Co-ordinator	Dr K C C	neung, Statistics & Actuarial Science (kcc	g@hku.hk)			
Teachers Involved	Dr K C C	neung, Statistics & Actuarial Science				
Course Objectives		Risk theory is one of the main topics in actuarial science. Risk theory is the applications of statistica models and stochastic processes to insurance problems such as the premium calculation, ruin probability etc.				
Course Contents & Topics		Severity models; frequency models; collective risk models; coverage modifications; ruin theory; risk measures; simulation.				
Course Learning Outcomes	Under expectati     Estima amounts     Calcula	On successful completion of the course, students should be able to:  1. Understand the individual risk model and the collective risk model, evaluate the distribution and expectation of the total claim amounts.  2. Estimate the premium of a policyholder and the total claim amounts using the information of the claim amounts made in previous years.  3. Calculate some commonly used risk measures and explain their use and limitation.  4. Apply simulation methods within the context of actuarial models.				
Pre-requisites and Co-requisites and mpermissible combination)		Pass in STAT3903 Stochastic models, or already enrolled in this course; or Pass in STAT3603 Probability modelling or MATH3603 Probability theory				
Offer in 2014 - 2015	Y 2n	d sem	Exa	amination	May	
D.C	Υ					
Offer in 2015 - 2016	I					
	A+ to F					
Course Grade		Demonstrate thorough mastery at an advanced course learning outcomes. Show strong analyth thought, and ability to apply knowledge to a wiffective organizational and presentational skills	cal and critical abilities and lo	ogical thinking, wit	h evidence of origina	
Course Grade	A+ to F	course learning outcomes. Show strong analyti thought, and ability to apply knowledge to a wi	cal and critical abilities and lot de range of complex, familial complex of the complex of the complex of knowledge and skill of analytical and critical abil	ogical thinking, wit r and unfamiliar si ls required for atta lities and logical tl	h evidence of original tuations. Apply highly ining at least most of hinking, and ability to	
Course Grade	A+ to F	course learning outcomes. Show strong analyti thought, and ability to apply knowledge to a wifefective organizational and presentational skills.  Demonstrate substantial command of a broad the course learning outcomes. Show evidence	cal and critical abilities and k de range of complex, familial range of knowledge and skill of analytical and critical abil r situations. Apply effective or d of knowledge and skills re- lalytical and critical abilities a	ogical thinking, wit r and unfamiliar si ls required for atta lities and logical tl rganizational and p quired for attaining and logical thinking	h evidence of original tuations. Apply highly ining at least most of hinking, and ability to presentational skills. g most of the course g, and ability to apply	
Offer in 2015 - 2016  Course Grade  Grade Descriptors	A+ to F  A  B	course learning outcomes. Show strong analyti thought, and ability to apply knowledge to a will effective organizational and presentational skills. Demonstrate substantial command of a broad the course learning outcomes. Show evidence apply knowledge to familiar and some unfamilia Demonstrate general but incomplete commanulearning outcomes. Show evidence of some are	cal and critical abilities and to de range of complex, familiar in a care of knowledge and skill of analytical and critical abilities resituations. Apply effective or dof knowledge and skills realytical and critical abilities and critical abilities and critical arealytical and critical arealytical and critical abilities and critical arealytical and critical arealytical and critical arealytical and critical abilities and critical arealytical and critical arealytical and critical arealytical and logical thinking, but with	ogical thinking, wit r and unfamiliar si is required for atta lities and logical the rganizational and p quired for attaining and logical thinking nal and presentation or attaining some in limited analytical	h evidence of original tuations. Apply highly sining at least most of hinking, and ability to oresentational skills. g most of the course g, and ability to apply onal skills. of the course learning and critical abilities.	
Course Grade	A+ to F  A  B	course learning outcomes. Show strong analyti thought, and ability to apply knowledge to a wifefective organizational and presentational skills.  Demonstrate substantial command of a broad the course learning outcomes. Show evidence apply knowledge to familiar and some unfamilian.  Demonstrate general but incomplete commanilearning outcomes. Show evidence of some at knowledge to most familiar situations. Apply moducomes. Show evidence of some coherent Show limited ability to apply knowledge to sc	cal and critical abilities and I de range of complex, familian in a complex and skill of analytical and critical ability at a complex and skill and critical ability and critical abilities and critical and critical abilities and critical and critical abilities and critical and critical abilities and critical and critical abilities and critical and logical thinking, but with live problems. Apply limited and logical thinking, but with live problems. Apply limited and logical and coherent thinking, logical and coherent thinking.	ogical thinking, wit r and unfamiliar si is required for atta lities and logical ti rganizational and p quired for attaining and logical thinking and logical thinking and logical thinking and presentation or attaining some a limited analytical or barely effectiv quired for attaining ng. Show very little	h evidence of original tuations. Apply highly tuning at least most of hinking, and ability to presentational skills. g most of the course g, and ability to apply onal skills. of the course learning and critical abilities. e organizational and g the course learning or no ability to apply e or no ability to apply	
Course Grade	A+ to F  A  B  C  D	course learning outcomes. Show strong analyti thought, and ability to apply knowledge to a wieffective organizational and presentational skills.  Demonstrate substantial command of a broad the course learning outcomes. Show evidence apply knowledge to familiar and some unfamilia.  Demonstrate general but incomplete command learning outcomes. Show evidence of some at knowledge to most familiar situations. Apply most outcomes. Show evidence of some coherent Show limited ability to apply knowledge to so presentational skills.  Demonstrate little or no evidence of command outcomes. Lack of analytical and critical abilitie	cal and critical abilities and I de range of complex, familian in a complex and skill of analytical and critical ability at a complex and skill and critical ability and critical abilities and critical and critical abilities and critical and critical abilities and critical and critical abilities and critical and critical abilities and critical and logical thinking, but with live problems. Apply limited and logical thinking, but with live problems. Apply limited and logical and coherent thinking, logical and coherent thinking.	ogical thinking, wit r and unfamiliar si is required for atta lities and logical ti rganizational and p quired for attaining and logical thinking and logical thinking and logical thinking and presentation or attaining some a limited analytical or barely effectiv quired for attaining ng. Show very little	h evidence of original tuations. Apply highly tuning at least most of hinking, and ability to presentational skills. g most of the course g, and ability to apply onal skills. of the course learning and critical abilities. e organizational and g the course learning or no ability to apply e or no ability to apply	

	Lectures		36
	Tutorials		12
	Reading / Self study		100
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)
	Assignments	Coursework (assignments, tutorials, and a class test)	25
	Examination	One 3-hour written examination	75
Required/recommended reading and online materials	Klugman S. A., Panjer H. H., & V Inc., 2012, 4th edition)	Villmot G. E.: Loss Models: From Data to Decisions	s (John Wiley & Sons,
Course Website	moodle.hku.hk		

STAT3907 Linear models	and forecas	sting (6 credits)		Academic Year	2014	
Offering Department	Statistics 8	& Actuarial Science		Quota		
Course Co-ordinator	Prof Y Lar	Prof Y Lam, Statistics & Actuarial Science (ylam@saas.hku.hk)				
Teachers Involved	Prof Y Lar	Prof Y Lam, Statistics & Actuarial Science				
Course Objectives		se deals with applied statistical methods is through using linear models and time		and investigates v	arious forecasting	
Course Contents & Topics	including	Regression and multiple linear regression; predicting; generalised linear model; time series models including autoregressive, moving average, autoregressive-moving average and integrated models forecasting.				
Course Learning Outcomes	On succes	ssful completion of the course, students	should be able to:			
	<ul><li>2. Do ANC</li><li>3. Fit a get</li><li>4. Identify</li><li>5. Perform</li></ul>	<ol> <li>Fit a simple or multiple linear regression model to real data.</li> <li>Do ANOVA analysis.</li> <li>Fit a generalized linear model to the real data.</li> <li>Identify and fit a suitable AR, MA or ARMA model to real data.</li> <li>Perform residual analysis.</li> <li>Do forecasting with these fitted models.</li> </ol>				
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in ST For BSc(A Not for stu course; an Not for stu course; an	udents who have passed in STAT460' nd udents who have passed in ECON2280	enrolled in this course Linear statistical anal 1 Time-series analys	ysis, or have alreadis, or have alread	dy enrolled in this	
Offer in 2014 - 2015	Y 2nd	sem		Examination	May	
Offer in 2015 - 2016	Υ		1			
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 the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.				
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.				
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.				
	Fail	Fail  Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.				
Course Type	Lecture-ba	ased course				
Course Teaching	Activities	S	Details		No. of Hours	
& Learning Activities	Lectures				36	
			-			
	Tutorials				12	
	Tutorials	/ Self study			12	
	Tutorials	•	Details			

	Examination	tutorials, and a class test)  One 3-hour written examination	75			
Required/recommended reading and online materials	edition) Abraham & J. Ledolter: Statistical Methods	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,				
Course Website	moodle.hku.hk					

STAT3908 Credibility the	ory and loss	distributions (6 credits)		Academic Year	2014	
Offering Department	Statistics 8	Actuarial Science		Quota		
Course Co-ordinator	Dr K C Ch	eung, Statistics & Actuarial Science (kc	cg@hku.hk)			
Teachers Involved	Dr K C Ch	Dr K C Cheung, Statistics & Actuarial Science				
Course Objectives	calculation a particula	Credibility is an example of a statistical estimate. The idea of credibility is very useful in premium calculation. Insurance loss varies according to the business nature, what distribution should be used to a particular loss is both of theoretical interest and practical importance. This course covers importan actuarial and statistical methods.				
Course Contents & Topics	estimations loss distrib	Limited fluctuation approach; Buhlman's approach; Bayesian approach; empirical Bayes paramete estimations; construction and selection of parametric models; properties and estimation of failure time an loss distributions, determination of the acceptability of a fitted model; comparison of fitted models simulation of both discrete and continuous random variables.				
Course Learning Outcomes	On successful completion of the course, students should be able to:					
	<ol> <li>Perform</li> <li>Apply B model.</li> <li>Apply co</li> <li>Apply er</li> <li>Constru</li> </ol>	<ol> <li>Apply limited fluctuation (classical) credibility including criteria for both full and partial credibility.</li> <li>Perform Bayesian analysis using both discrete and continuous models.</li> <li>Apply Buhlmann and Buhlmann-Straub models and understand the relationship of these to the Bayesi model.</li> <li>Apply conjugate priors in Bayesian analysis and in particular the Poisson-gamma model.</li> <li>Apply empirical Bayesian methods in the nonparametric and semiparametric cases.</li> <li>Construct and select empirical models.</li> <li>Determine the acceptability of a fitted model and/or compare models.</li> </ol>				
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in ST	Pass in STAT2602 Probability and statistics II or STAT3902 Statistical models or STAT3906 Risk theory				
Offer in 2014 - 2015	Y 1st	sem		Examination	Dec	
Offer in 2015 - 2016	Υ					
Course Grade	A+ to F					
Grade Descriptors	В	Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.  Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.				
	С	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 abid Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational presentational skills.			I and critical abilities.	
	Fail	Demonstrate little or no evidence of comman outcomes. Lack of analytical and critical abilitie knowledge to solve problems. Organization and	es, logical and coherent the	ninking. Show very little	or no ability to apply	
Course Type	Lecture-ba	sed course				
Course Teaching	Activities		Details		No. of Hours	
& Learning Activities	Lectures				36	
	Tutorials				12	
	Reading / Self study				100	
	Reading /	Self study			100	
	Reading /	Self study	Details		Weighting in final	
		,		signments,	Weighting in final course grade (%)	
Assessment Methods and Weighting	Methods	nts	Coursework (ass	signments, s test)	Weighting in final course grade (%)	
	Methods  Assignme  Examinati	nts on S. A., Panjer H. H., & Willmot G. E.: Los	Coursework (ass tutorials, and a clas One 3-hour written	signments, s test)	Weighting in final course grade (%) 25	

STAT3909 Advanced life				Ouete		
Offering Department		& Actuarial Science	_	Quota		
Course Co-ordinator		Prof H L Yang, Statistics & Actuarial Science (hlyang@hku.hk)				
Teachers Involved		Prof H L Yang, Statistics & Actuarial Science				
Course Objectives	for Life C	The objective of the course is to prepare students for the Non-traditional Life Insurance parts of the Models for Life Contingencies (MLC) course of the Society of Actuaries. Emphasis will be placed on applications o more advanced theories of life contingencies.				
Course Contents & Topics	Loss-at-is	This course is a continuation of the materials covered in STAT3901. We shall discuss the following to Loss-at-issue random variable, Benefit premium, Future loss random variable, Benefit reserves, Cash projection, Present value of cash flows, Expenses and asset shares.				
Course Learning Outcomes	On succe	essful completion of the course, sto	udents should be able to:			
	insurance 2. model 3. model flows. 4. calcula 5. incorpo	d concepts presented for traditions. cash flows for basic Non-traditions cash flows of basic Non-traditions ate benefit policy values for basic Norate expenses in gross premiumes and annuities.	al life insurances and calcul nal life insurance and calcu Non-traditional life insurance	ate contract level late the present	values. values of the cash	
Pre-requisites (and Co-requisites and Impermissible combination)		STAT3901 Life contingencies, or a Actuarial Science) students only.	ready enrolled in this cours	e; and		
Offer in 2014 - 2015	Y 2nd	d sem		Examination	May	
Offer in 2015 - 2016	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 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-b	pased course				
Course Teaching	Activitie	es	Details		No. of Hours	
& Learning Activities	Lectures	S			36	
	Tutorials	3			12	
	Reading	/ Self study			100	
Assessment Methods and Weighting	Methods	s	Details		Weighting in final course grade (%)	
	Assignm	nents	Coursework (ass tutorials, and a clas	signments, s test)	25	
			One 2 hour written	examination	75	
	Examination  One 3-hour written examination  Bowers, N. L. et al.: Actuarial Mathematics (Society of Actuaries, 1997, 2nd ed)  Dickson, C.M.D., Hardy, M.R. and Waters, H.R.: Actuarial Mathematics for Life Contingent Risk					
Required/recommended reading and online materials	Bowers, I	N. L. et al.: Actuarial Mathematics	(Society of Actuaries, 1997	, 2nd ed)		

STAT3910 Financial ec	Academic Year	2014				
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 Dr J Song, Statistics & Actuarial Science					
Course Objectives	This course is a basic course on the derivative market. The course covers discrete-time models, volatility estimation, and Black-Scholes formula and its variations. The course also includes some basic risk management ideas and methods. This course and STAT3911 will cover all the concepts, principles and					

	technique	s needed for SoA Exam MFE.				
Course Contents & Topics	discrete-ti	Option market; European and American options; conditional expectation and discrete-time martingale, discrete-time option-pricing theory; binomial model and its Greeks; true probabilities vs. risk-neutral probabilities; estimating volatility; the Black-Scholes formula; implied volatility; Greeks again; market making and hedging; exotic options.				
Course Learning Outcomes	On succes	ssful completion of the course, students	s should be able to:			
	<ol> <li>Unders</li> <li>Unders</li> <li>unders</li> <li>Unders</li> <li>implied vo</li> <li>Unders</li> </ol>	te option price using binomial tree. tand the risk neutral probability. tand basic probability theory, include pall expectation and discrete time marting trand the Black-Scholes formula and platility. tand the hedging strategies and portfol tand exotic options.	gale. its assumptions, the G	reek letters, opti	on elasticity, and	
Pre-requisites (and Co-requisites and Impermissible combination)	Not for st 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 already enrolled in this course; and Not for students who have passed in FINA2322 Derivatives, or have already enrolled in this course.				
Offer in 2014 - 2015	Y 1st	sem	E	xamination	Dec	
Offer in 2015 - 2016	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.					
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.				
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.				
	Fail	Fail  Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.				
Course Type	Lecture-ba	ased course				
Course Teaching	Activities	S	Details		No. of Hours	
& Learning Activities	Lectures				36	
	Tutorials				12	
	Reading	/ Self study			100	
Assessment Methods and Weighting	Methods	;	Details		Veighting in final course grade (%)	
	Assignme	ents	Coursework (assitutorials, and a class	gnments, test)	25	
	Examinat	tion	One 3-hour written ex	xamination	75	
Required/recommended reading and online materials	Lecture no	McDonald: Derivatives Markets (2nd e otes on conditional expectations and m Options, Futures and other Derivative	artingale			
Course Website	moodle.hk	ku.hk				

STAT3911 Financial econo	TAT3911 Financial economics II (6 credits)				
Offering Department	Statistics & Actuarial Science Quota				
Course Co-ordinator	Prof H L Yang, Statistics & Actuarial Science (hlyang@hku.hk)				
Teachers Involved	Prof H L Yang, Statistics & Actuarial Science				
Course Objectives	This course is an advanced course on the option pricing theory. The course covers Black-Scholes equation and stochastic calculus, and interest models. This course and STAT3910 will cover all the concepts, principles and techniques needed for SoA Exam MFE.				
Course Contents & Topics	Brownian motion; introduction to stochastic calculus; arithmetic and geometric Brownian motion; Ito formula; Sharpe ratio and risk premium; Black-Scholes equation; risk-neutral stock-price process and option pricing; option's elasticity and volatility; Vasicek, Cox-Ingersoll-Ross, and Black-Derman-Toy models; delta-hedging for bonds and the Sharpe-ratio equality constraint; Black's model; options on zero coupon bonds; interest-rate caps and caplets.				
Course Learning Outcomes	On successful completion of the course, students should be able to:  1. Understand Brownian motion and its properties. 2. Understand the Ito calculus and Ito formula.				
	587				

and Co-requisites and mpermissible combination)  Offer in 2014 - 2015  Offer in 2015 - 2016  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 high effective organizational and presentational skills.  B Demonstrate substantial command of a broad range of knowledge and skills required for attaining all the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and complete command of analytical and critical abilities and logical thinking. Apply promote a complete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and correct partial but limited command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of come analytical and critical abilities and logical thinking and ability to apply knowledge to familiar and critical abilities and logical thinking and ability to apply knowledge to a skills required for attaining most of the course learning outcomes. Show evidence of command of knowledge and skills required for attaining and the course learning outcomes. Show evidence of command of knowledge and skills required for attaining and to a course learning outcomes. Show evidence of command of knowledge and skills required for attaining the course learning outcomes. Show evidence of command of knowledge and skills required for attaining and to a course learning outcomes. Show evidence of command of knowledge and skills required for attaining and to a course in second and critical abilities and logical thinking.		4. Underst	<ol> <li>Understand the Black-Scholes model and option pricing theory.</li> <li>Understand the delta hedging and some basic risk management methods.</li> <li>Understand some basic interest rate models.</li> </ol>				
A+ to F  A-	Pre-requisites (and Co-requisites and Impermissible combination)		Pass in MATH3603 Probability theory or STAT3603 Probability modelling or STAT3903 Stochastic models or STAT3910 Financial economics I				
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 high effective organizational and presentational skills.  B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most 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 for most familiar situations. Apply immediately effective organizational and presentational skills.  D Demonstrate partial but limited command of knowledge and skills required for attaining most of the course show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational 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 some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities, logical and coherent thinking, but were placed to course in the course of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills.  Packet Learning Activities  Activities  Details No. of Ho	Offer in 2014 - 2015	Y 2nd	sem	Examination	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 complex, familiar and unfamiliar situations. Apply high effective organizational and presentational skills.  B Demonstrate substantial command of a browd range of knowledge and skills required for attaining at least most the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to infamiliar 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 and orbinary little or not 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. Show evidence of some coherent and logical and coherent thinking. Show very little or not ability to apply knowledge to solve problems. Organization and presentational skills.  Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining some of the course grade (show limited abilities, logical and coherent thinking. Show very little or not ability to apply knowledge to solve problems. Organization and presentational and coherent thinking. Show very little or not ability to apply knowle	Offer in 2015 - 2016	Υ	Υ				
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 a broad range of knowledge and skills required for attaining at least most 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 on the course learning outcomes. Show evidence of some analytical and critical abilities of show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show ilmited ability to appl 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. Lack of analytical and critical abilities. 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, blow very little or no ability to appl knowledge to solve problems. Organization and presentational skills.  Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining some of the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking, but with evidence of some analytical and critical abilities. Apply limited command of knowledge and skills required for	Course Grade	A+ to F					
the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability tapply knowledge to trailliar 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 modely 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 abilities Show limited abilities Show limited abilities Show limited abilities Show limited abilities on presentational skills.  Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining some of the course learnin outcomes. Show evidence of command of knowledge and skills required for attaining the course learnin outcomes. Show within a presentational skills are minimally effective organizational and presentational skills are minimally effective organizational and presentational skills are minimally effective organizational and presentational skills are minimally effective organizational and presentational skills are minimally effective organizational and skills required for attaining some of the course general deviations.  Eccurse Type  Lecture-based course  Activities  Details  No. of Hour Activities  Activities  Petails  No. of Hour Activities  Activities  Petails  Coursework (assignments, tutorials, and a class test)  Assignments  Examination  One 3-hour written examination  7  Required/recommended eading and ordical abilities and ordical abilities and ordical abilities and critical abilities and critical abilities and critical abilities and critical abilities.  Course Wri	Grade Descriptors	A	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 unfamil	g, with evidence of original		
learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to appl knowledge to most familiar situations. Apply most familiar situations. Apply most familiar situations. Apply most familiar situations abilities and presentational skills.    D		В	the course learning outcomes. Show evider	nce of analytical and critical abilities and log	ical thinking, and ability to		
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-based course  Activities  Activities  Details  No. of Hour lectures  Tutorials  Reading / Self study  Methods  Details  Weighting in fin. course grade (9)  Assignments  Examination  Coursework (assignments, tutorials, and a class test)  Examination  One 3-hour written examination  Required/recommended eading and online materials  Robert L. McDonald: Derivatives Markets (2nd edition), Chapters 20, 21 and 24.  John Hull: Options, Futures and Other Derivatives (2008, 7th edition)  Alison Etheridge: A Course in Financial Calculus (2002)  Steven Shreve: Stochastic Calculus for Finance II Continuous-Time Models (2008)		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.				
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  Activities    Activities   Details   No. of Hour		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.				
Course Teaching & Learning Activities    Activities		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.				
Lectures  Tutorials Reading / Self study  Methods  Assessment Methods and Weighting  Methods  Assignments  Examination  Required/recommended eading and online materials  Reduired/reversity and online materials  Lectures  Tutorials  Reading / Self study  Details  Weighting in fine course grade (% Coursework (assignments, tutorials, and a class test)  Examination  One 3-hour written examination  7  Required/recommended eading and online materials  Returned  Recourse (% Course work (assignments, tutorials, and a class test)  Examination  One 3-hour written examination  7  Republic (% Course work (assignments, tutorials, and a class test)  Examination  Required/recommended eading and online materials  Republic (% Course work (assignments, tutorials, and a class test)  Examination  Required/recommended eading and online materials  Republic (% Course work (assignments, tutorials, and a class test)  Examination  Required/recommended eading and online materials  Republic (% Course work (assignments, tutorials, and a class test)  Examination  Required/recommended eading and online materials	Course Type	Lecture-ba	ased course				
Lectures Tutorials Reading / Self study  Methods  Methods  Assessment Methods and Weighting  Methods  Details  Coursework (assignments, tutorials, and a class test)  Examination  Required/recommended eading and online materials  Reversity of the distribution of the	Course Teaching	Activities	3	Details	No. of Hours		
Reading / Self study  Methods  Details  Coursework (assignments, tutorials, and a class test)  Examination  Required/recommended eading and online materials  Reading / Self study  Details  Coursework (assignments, tutorials, and a class test)  Examination  One 3-hour written examination  7  Robert L. McDonald: Derivatives Markets (2nd edition), Chapters 20, 21 and 24. John Hull: Options, Futures and Other Derivatives (2008, 7th edition)  Alison Etheridge: A Course in Financial Calculus (2002)  Steven Shreve: Stochastic Calculus for Finance II Continuous-Time Models (2008)	& Learning Activities	Lectures			36		
Assessment Methods and Weighting  Methods  Details  Coursework (assignments, tutorials, and a class test)  Examination  Required/recommended eading and online materials  Return Methods  Details  Coursework (assignments, tutorials, and a class test)  One 3-hour written examination  7  Required/recommended eading and online materials  Return Methods  One 3-hour written examination  7  Required/recommended eading and online materials  Repuired/recommended eading and online materials  Return Methods  One 3-hour written examination  7  Required/recommended eading and online materials  Repuired/recommended eading and online materials		Tutorials			12		
Assignments  Examination  Required/recommended eading and online materials  Methods  Coursework (assignments, tutorials, and a class test)  Examination  One 3-hour written examination  7  Robert L. McDonald: Derivatives Markets (2nd edition), Chapters 20, 21 and 24. John Hull: Options, Futures and Other Derivatives (2008, 7th edition)  Alison Etheridge: A Course in Financial Calculus (2002)  Steven Shreve: Stochastic Calculus for Finance II Continuous-Time Models (2008)		Reading /	/ Self study		100		
Assignments tutorials, and a class test)  Examination One 3-hour written examination  Required/recommended eading and online materials  Robert L. McDonald: Derivatives Markets (2nd edition), Chapters 20, 21 and 24.  John Hull: Options, Futures and Other Derivatives (2008, 7th edition)  Alison Etheridge: A Course in Financial Calculus (2002)  Steven Shreve: Stochastic Calculus for Finance II Continuous-Time Models (2008)	Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)		
Required/recommended eading and online materials  Robert L. McDonald: Derivatives Markets (2nd edition), Chapters 20, 21 and 24.  John Hull: Options, Futures and Other Derivatives (2008, 7th edition)  Alison Etheridge: A Course in Financial Calculus (2002)  Steven Shreve: Stochastic Calculus for Finance II Continuous-Time Models (2008)		Assignme	ents	(	25		
John Hull: Options, Futures and Other Derivatives (2008, 7th edition)  Alison Etheridge: A Course in Financial Calculus (2002)  Steven Shreve: Stochastic Calculus for Finance II Continuous-Time Models (2008)		Examinat	iion	One 3-hour written examination	75		
Course Website moodle hku hk	Required/recommended reading and online materials	John Hull: Alison Eth	Options, Futures and Other Derivative eridge: A Course in Financial Calculus	es (2008, 7th edition) s (2002)			
, inodicinicanic	Course Website	moodle.hk	xu.hk	. ,			

STAT3951 Advanced conti	ngencies (6 credits)	Academic Year	2014		
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	This course serves as a continuation of STAT3909 and exten and actuarial techniques used in the field of life and non-life course is a part of the requirement for the exemption from thand Institute of Actuaries, U.K.]	insurance. [Students are	reminded that this		
Course Contents & Topics	Topic covers further analysis of the multiple state model; un options; applications of actuarial techniques to a wide ra insurance products and valuation of these products.				
Course Learning Outcomes	<ol> <li>Value the cashflow contingent upon more than one risk.</li> <li>Understand how to use multiple decrement tables to evamore than one decrement.</li> <li>Understand the equity linked insurance products, and the insurance products.</li> <li>Understand the Esscher transform and its application to opt 5. Value equity-linked death benefits.</li> </ol>	aluate expected cashflow method and idea of valuir			
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in STAT3909 Advanced life contingencies; and For BSc(Actuarial Science) students only.				
Offer in 2014 - 2015	Y 1st sem	Examination	Dec		
Offer in 2015 - 2016	Υ				

Grade Descriptors	A	Demonstrate thorough mastery at an advanced course learning outcomes. Show strong analyti thought, and ability to apply knowledge to a wi effective organizational and presentational skills	ical and critical abilities and logical thinking ide range of complex, familiar and unfamili	, with 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					
	D	Demonstrate partial but limited command of kno outcomes. Show evidence of some coherent a Show limited ability to apply knowledge to so presentational skills.	and logical thinking, but with limited analy	tical and critical abilities.		
	Fail	Demonstrate little or no evidence of command outcomes. Lack of analytical and critical abilities knowledge to solve problems. Organization and	s, logical and coherent thinking. Show very	little or no ability to apply		
Course Type	Lecture-b	ased course				
Course Teaching & Learning Activities	Activitie	s	Details	No. of Hours		
& Learning Activities	Lectures			36		
	Tutorials			12		
	Reading / Self study			100		
Assessment Methods and Weighting	Methods	3	Details	Weighting in final course grade (%)		
	Assignm		Coursework (assignments, tutorials, and a class test)	25		
	Examination		One 3-hour written examination	75		
Required/recommended reading and online materials	Dickson, CT5 Con	N. L. et al.: Actuarial Mathematics (Society D. et al.: Actuarial Mathematics for Life Co ingencies Core Technical Core Reading ote on equity linked insurance products.	ontingent Risks (Cambridge, 2010)	)		
Course Website	moodle.h	ku.hk				

STAT3952 Investment and	asset mai	nagement (6 credits)	Academic Year	2014
Offering Department	Statistics	& Actuarial Science	Quota	
Course Co-ordinator	TBC, Stat	tistics & Actuarial Science ()		
Teachers Involved	TBC, Stat	tistics & Actuarial Science		
Course Objectives	commonly	n objective of this course is to introduce students to so y used in the management of an investment portfolio. En oblems faced by insurance industry such as investment stra- nent.	nphasis will be place	d on methods t
Course Contents & Topics	actuarial	rse provides an overview on the problems faced by ac concepts to investment practice. This course will cov- nent Process, Asset Allocation, Managing Fixed Inc ment.	er the following top	ics: Investmen
	2. Identify 3. Describ 4. Describ 5. Explain 6. Describ 7. Identify 8. Define 9. Apply 10. Selec	n how an investment policy and an investment strategy can the obligations of a fiduciary in managing investment portion on the object an investment strategy for an individual, one the particular issues influencing investment strategies for principles of risk-based capital management, one asset allocation strategies that can be used to construct the and describe financial and non-financial risks faced by an risk metrics to quantify major types of risk exposure. ALM principles to the establishment of investment policy and to rebuild a benchmark for a given portfolio or portfolio manaribe and assess performance measurement methodologies	olios.  r institutional investor: an asset portfolio. entity. d strategy. agement style.	
Pre-requisites (and Co-requisites and Impermissible combination)	For BSc(A	TAT3901 Life contingencies; and Actuarial Science) students only; and tudents who have passed in FINA2320 Investments and n this course.	d portfolio analysis,	or have alread
Offer in 2014 - 2015	N		Examination	
Offer in 2015 - 2016	N			
Course Grade	A+ to F			
Grade Descriptors	A	Demonstrate thorough mastery at an advanced level of extensive knicourse 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.	s and logical thinking, with	evidence of origina
	В			

		apply knowledge to familiar and some unfamil	liar situations. Apply effective organizational a	and presentational skills.		
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.				
	D	Demonstrate partial but limited command of k outcomes. Show evidence of some coheren Show limited ability to apply knowledge to presentational skills.	t and logical thinking, but with limited analy	rtical and critical abilities.		
	Fail	Demonstrate little or no evidence of comma outcomes. Lack of analytical and critical abilit knowledge to solve problems. Organization at	ies, logical and coherent thinking. Show very	little or no ability to apply		
Course Type	Lecture-b	ased course				
Course Teaching & Learning Activities	Activitie	S	Details	No. of Hours		
a Learning Activities	Lectures			36		
	Tutorials			12		
	Reading / Self study			100		
Assessment Methods and Weighting	Methods	<b>S</b>	Details	Weighting in final course grade (%)		
	Assignm	ents	Assignments, tutorials/example classes, group discussions, project and presentation	50		
	Examina	tion	One 2-hour written examination	50		
Required/recommended reading and online materials	Z. Bodie, Crouhy, G F. J. Fabo	Babbel & F. J. Fabozzi: Investment Management for Insurers (Frank J. Fabozzi & Assoc., 1999) Bodie, A. Kane, & A. Marcus: Investments (McGraw-Hill, 2005, 7th edition) ouhy, Galai, & Mark: Risk Management (2001) J. Fabozzi: Handbook of Fixed Income Securities (McGraw-Hill, 2005, 7th edition) terman: Modern Investment Management: An Equilibrium Approach (2003)				
Course Website	moodle.hl	ku.hk				
Additional Course Information	A Dynami	erences: J. L. Maginn, D.L. Tuttle, J.E. l ic Process (Wiley, 2007, 3rd edition) sset / Liability Management of Financial	, ,	Investment Portfolios,		

STAT3953 Fundamentals o	of actuarial practice (6 credits)	Academic Year	2014	
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 & Actuarial Science			
Course Objectives	This course teaches students about the business environment and situations using the actuarial control cycle as a framework.	d exposes them to p	oractical real-worl	
Course Contents & Topics	This course provides an overview on selected materials relating Professional Actuary, External Forces, Risk in Actuarial Probler Solutions. Emphasis will be placed on applications to various fin individual life insurance, group insurance, social security plans, reproperty & casualty insurance.	ms, Design and Pr ancial security prog	ricing of Actuaria grammes including	
Course Learning Outcomes	On successful completion of the course, students should be able to:  1. Provide introductory description of financial security systems, common actuarial techniques ar practical experiences.  2. Describe actuarial practices, principles, approaches, methods, commonalities, problems and solutions  3. Explain actuarial practices across the traditional areas of practice.  4. Explain actuarial practices as applied directly on behalf of financial security system providers or as consultant to those providers.  5. Apply actuarial skills in nontraditional and emerging areas of practice.  6. Provide context for the specific mathematical and technical skills developed in the basic actuaric courses.			
	<ol> <li>Explain actuarial practices across the traditional areas of practice.</li> <li>Explain actuarial practices as applied directly on behalf of finan consultant to those providers.</li> <li>Apply actuarial skills in nontraditional and emerging areas of practice.</li> <li>Provide context for the specific mathematical and technical sills.</li> </ol>	cial security system tice. kills developed in the	providers or as	
(and Co-requisites and	<ol> <li>Explain actuarial practices across the traditional areas of practice.</li> <li>Explain actuarial practices as applied directly on behalf of finan consultant to those providers.</li> <li>Apply actuarial skills in nontraditional and emerging areas of practice. Provide context for the specific mathematical and technical si courses.</li> </ol>	cial security system tice. kills developed in the	providers or as	
and Co-requisites and mpermissible combination)	<ol> <li>Explain actuarial practices across the traditional areas of practice.</li> <li>Explain actuarial practices as applied directly on behalf of finan consultant to those providers.</li> <li>Apply actuarial skills in nontraditional and emerging areas of pract.</li> <li>Provide context for the specific mathematical and technical sicourses.</li> <li>Prepare for the professional role as an Associate of the Society of Pass in STAT3909 Advanced life contingencies; and</li> </ol>	cial security system tice. kills developed in the	providers or as	
and Co-requisites and mpermissible combination) Offer in 2014 - 2015	<ol> <li>Explain actuarial practices across the traditional areas of practice.</li> <li>Explain actuarial practices as applied directly on behalf of finan consultant to those providers.</li> <li>Apply actuarial skills in nontraditional and emerging areas of practice.</li> <li>Provide context for the specific mathematical and technical sicourses.</li> <li>Prepare for the professional role as an Associate of the Society of Pass in STAT3909 Advanced life contingencies; and For BSc(Actuarial Science) students only.</li> </ol>	cial security system tice. kills developed in the f Actuaries.	providers or as a	
(and Co-requisites and impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016	3. Explain actuarial practices across the traditional areas of practice. 4. Explain actuarial practices as applied directly on behalf of finan consultant to those providers. 5. Apply actuarial skills in nontraditional and emerging areas of pract 6. Provide context for the specific mathematical and technical si courses. 7. Prepare for the professional role as an Associate of the Society of Pass in STAT3909 Advanced life contingencies; and For BSc(Actuarial Science) students only.  Y. 1st sem.	cial security system tice. kills developed in the f Actuaries.	providers or as	
(and Co-requisites and Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade	3. Explain actuarial practices across the traditional areas of practice. 4. Explain actuarial practices as applied directly on behalf of finan consultant to those providers. 5. Apply actuarial skills in nontraditional and emerging areas of practice. Provide context for the specific mathematical and technical sicourses. 7. Prepare for the professional role as an Associate of the Society of Pass in STAT3909 Advanced life contingencies; and For BSc(Actuarial Science) students only.  Y 1st sem  Y	cial security system tice. kills developed in the factuaries.  Examination  owledge and skills requires and logical thinking, with the cial security security security.	he basic actuaria  No Exam  red for attaining all the the evidence of original	
Pre-requisites (and Co-requisites and Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade Grade Descriptors	S. Explain actuarial practices across the traditional areas of practice.     Explain actuarial practices as applied directly on behalf of finan consultant to those providers.     Apply actuarial skills in nontraditional and emerging areas of practice. Provide context for the specific mathematical and technical stourses.     Prepare for the professional role as an Associate of the Society of Pass in STAT3909 Advanced life contingencies; and For BSc(Actuarial Science) students only.  Y 1st sem  Y  A+ to F  Demonstrate thorough mastery at an advanced level of extensive kn course learning outcomes. Show strong analytical and critical abilitie thought, and ability to apply knowledge to a wide range of complex.	cial security system tice. kills developed in the factuaries.  Examination  Examination  cowledge and skills requires and logical thinking, wifamiliar and unfamiliar seand skills required for attained abilities and logical thinking and skills required for attaining and skills required for attaining and skills required for attaining and logical stills and logical stills.	he basic actuaria  No Exam  red for attaining all the the evidence of origina ituations. Apply highly aining at least most of thinking, and ability to	

		knowledge to most familiar situations. App	ply moderately effective organizational a	and presentational skills.	
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learnir 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 con outcomes. Lack of analytical and critical a knowledge to solve problems. Organization	Show very little or no ability to apply		
Course Type	Lecture-	-based course			
Course Teaching & Learning Activities	Activiti	ies	Details	No. of Hours	
& Learning Activities	Lecture	es		36	
	Project work			12	
	Reading / Self study			100	
Assessment Methods and Weighting	Method	ds	Details	Weighting in final course grade (%)	
	Presen	tation	oral presentation	25	
	Project	reports	written report	50	
	Test		in-class quizzes	25	
Required/recommended reading and online materials	Bellis, C Control Brown, I Insurance	Klugman, S.: Understanding Actuarial Practice (Society of Actuaries, 2012) Bellis, C., Klugman, S., Shepherd, J., and Lyon, R.: Understanding Actuarial Management: The Actuarial 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 Casualty Insurance (ACTEX Publications, Inc., 2007, 3rd ed.) Segal, S.: Corporate Value of Enterprise Risk Management: The Next Step in Business Management (Wiley, 2011)			
			on management the treat on	p in Basiness Management	

STAT3954 Current topic	o iii aotaa	iai colonico (o croanco)	Academic Year	2014
Offering Department	Statistics &	Actuarial Science	Quota	
Course Co-ordinator	Prof W K L	i, Statistics & Actuarial Science (hrntlwk@hku.hk)		
Teachers Involved		.am, Mr Fred Choi & Mr Henry Cheung, Statistics & Actua Vong, Statistics & Actuarial Science	arial Science	
Course Objectives	the basic c	e aims at providing practical elements for actuarial studer apability to understand, research in and handle the laws students in their coming future career.		
Course Contents & Topics	For Practic Insurance, Reporting Pricing and For Actuar echoing of stimulating would dom	e covers a full range of topics related to both areas inclu- egal Thinking.  al Actuarial Practice: It covers the major practical topics it covers the full picture of actuarial control cycle inclu- and Experience Analysis. For General Insurance, it cov- I Valuation.  ies' Legal Thinking: This is the 7th year of the course a  nanges in the market for basic legal and general insurance legal materials with heavy involvement of actua- inate the course, alongside with basic legal research ski- ce from guests from the General Insurance Industry wou	s in both Life and Casualty iding Product Pricing, Valuers the backbone areas in and the full start of a new surance skills for actuarierial and other general insulls and fundamental legal	r areas. For Lift uation, Financia cluding Product course structures. Intellectually urance expertischinking. Sharin
Course Learning Outcomes	1. Have a Insurance. 2. Possess 3. Possess 4. Possess 5. Possess 6. Conduct	sful completion of the course, students should be able to: basic understanding regarding Actuarial Control Cycle for some experience regarding fundamental actuarial practic basic understanding of the legal system in Hong Kong, fundamental knowledge in certain core legal aspects suffundamental knowledge of the law of insurance, elementary legal researches when facing with legal proband the basic elements of a routine judgment, the matrix of the law of the law of the legal proband the basic elements of a routine judgment, the matrix of the law of	rom A to Z for Life Insurar ce through practical projecth as the law of contract arolems.	t. nd the law of to
Pre-requisites (and Co-requisites and (mpermissible combination)	Pass in ST	FAT3901 Life contingencies, or already enrolled in this co AT3909 Advanced life contingencies, or already enrolled ctuarial Science) students only.		
Offer in 2014 - 2015	N		Examination	
Offer in 2015 - 2016	N		·	
Course Grade	A+ to F			
Grade Descriptors	A	Demonstrate thorough mastery at an advanced level of extensive course learning outcomes. Show strong analytical and critical abil thought, and ability to apply knowledge to a wide range of comp effective organizational and presentational skills.	lities and logical thinking, with e	vidence of origina

	В	course learning outcom	es. Show evidence of a	ange of knowledge and skills required for att nalytical and critical abilities and logical thin ons. Apply effective organizational and presen	nking, and ability to apply
	С	outcomes. Show eviden	ce of some analytical ar	f knowledge and skills required for attaining r d critical abilities and logical thinking, and ab re organizational and presentational skills.	
	D	outcomes. Show eviden	ice of some coherent an	owledge and skills required for attaining sor d logical thinking, but with limited analytical ems. Apply limited or barely effective organiz	and critical abilities. Show
	Fail	outcomes. Lack of anal	ytical and critical abilitie	d of knowledge and skills required for atta s, logical and coherent thinking. Show very resentational skills are minimally effective or i	little or no ability to apply
Course Type	Lecture-	ased course			
Course Teaching	Activiti	S		Details	No. of Hours
& Learning Activities	Lecture				36
	Tutorial				12
	Reading	/ Self study			100
Assessment Methods and Weighting	Method			Details	Weighting in final course grade (%)
	Assignr	ents		Coursework (assignments, practical project & class test(s))	100
Course Website	moodle.l	ku.hk			

STAT3955 Survival analys	sis (6 credi	ts)	Academic Year	2014		
Offering Department	Statistics	& Actuarial Science	Quota			
Course Co-ordinator	Dr E K F	Lam, Statistics & Actuarial Science (hrntlkf@hku.hk)				
Teachers Involved	Dr E K F	Lam, Statistics & Actuarial Science				
Course Objectives	This course is concerned with how models which predict the survival pattern of humans or other entit are established. This exercise is sometimes referred to as survival-model construction.					
Course Contents & Topics	covered if function; parametric estimator and comp	The nature and properties of parametric and nonparametric survival models will be studied. Topics to covered include: the introduction of some important basic quantities like the hazard function and survival function; some commonly used parametric survival models; concepts of censoring and/or truncati parametric estimation of the survival distribution by maximum likelihood estimation method; nonparametestimation of the survival functions from possibly censored samples by means of the Kaplan-Me estimator, the Nelson-Aalen estimator; and the kernel density estimator or the Ramlau-Hansen estimand comparisons of k independent survival functions by means of the generalized log-rank test; parameteric proportional hazards regression model; and multivariate survival functions by means of the generalized log-rank test; parameteric proportional hazards regression model; and multivariate survival functions by means of the generalized log-rank test; parameteric proportional hazards regression model; and multivariate survival functions by means of the generalized log-rank test; parameteric proportional hazards regression model; and multivariate survival functions the functions of the generalized log-rank test; parameteric proportional hazards regression model; and multivariate survival functions the functions of the generalized log-rank test; parameteric proportional hazards regression model; and multivariate survival functions the functions of the generalized log-rank test.				
Course Learning Outcomes	On successful completion of the course, students should be able to:  1. Acquire a clear understanding of the nature of failure time data or survival data, a generalization of concept of death and life.  2. Perform estimation for some commonly used survival models under different types of censori mechanisms.  3. Analyze survival data using the Cox's semiparametric proportional hazards model.  4. Extend the Cox's model to a multivariate setup to accommodate multivariate survival data.					
	3. Analyz			ata.		
(and Co-requisites and	3. Analyz 4. Extend Pass in S		multivariate survival da	ata.		
and Co-requisites and mpermissible combination)	3. Analyz 4. Extend Pass in S Pass in S	I the Cox's model to a multivariate setup to accommodate STAT3902 Statistical models, or already enrolled in this co	multivariate survival da	May		
(and Co-requisites and Impermissible combination) Offer in 2014 - 2015	3. Analyz 4. Extend Pass in S Pass in S	I the Cox's model to a multivariate setup to accommodate STAT3902 Statistical models, or already enrolled in this cosTAT3600 Linear statistical analysis or STAT3901 Life cor	multivariate survival da urse; or ntingencies			
(and Co-requisites and Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016	3. Analyz 4. Extend Pass in S Pass in S	I the Cox's model to a multivariate setup to accommodate STAT3902 Statistical models, or already enrolled in this cosTAT3600 Linear statistical analysis or STAT3901 Life cor	multivariate survival da urse; or ntingencies			
(and Co-requisites and Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade	3. Analyz 4. Extend Pass in S Pass in S Y 2nd Y	I the Cox's model to a multivariate setup to accommodate STAT3902 Statistical models, or already enrolled in this cosTAT3600 Linear statistical analysis or STAT3901 Life cor	multivariate survival daurse; or ntingencies  Examination  knowledge and skills require lies and logical thinking, with	May  d for attaining all the nevidence of original		
(and Co-requisites and Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade	3. Analyz 4. Extend Pass in S Pass in S Y 2nd Y A+ to F	I the Cox's model to a multivariate setup to accommodate STAT3902 Statistical models, or already enrolled in this costAT3600 Linear statistical analysis or STAT3901 Life cord sem  Demonstrate thorough mastery at an advanced level of extensive known course learning outcomes. Show strong analytical and critical abilit thought, and ability to apply knowledge to a wide range of complexity.	multivariate survival daurse; or tiingencies  Examination  knowledge and skills require ies and logical thinking, with x, familiar and unfamiliar sit and skills required for attai ritical abilities and logical th	May  d for attaining all the nevidence of original uations. Apply highly ning at least most of inking, and ability to		
(and Co-requisites and Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade	3. Analyz 4. Extend Pass in S Pass in S Y A+ to F	I the Cox's model to a multivariate setup to accommodate STAT3902 Statistical models, or already enrolled in this costAT3600 Linear statistical analysis or STAT3901 Life conditions of the set of the	multivariate survival da urse; or ntingencies  Examination  Examinatio	May  Independent of the providence of original unations. Apply highly the providence of original unations. Apply highly the province of the course of the co		
Pre-requisites (and Co-requisites and Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade Grade Descriptors	3. Analyz 4. Extend Pass in S Pass in S Y 2nd Y A+ to F  A B	I the Cox's model to a multivariate setup to accommodate STAT3902 Statistical models, or already enrolled in this cost TAT3600 Linear statistical analysis or STAT3901 Life cord discrete setup.  Demonstrate thorough mastery at an advanced level of extensive k course learning outcomes. Show strong analytical and critical ability thought, and ability to apply knowledge to a wide range of complete effective organizational and presentational skills.  Demonstrate substantial command of a broad range of knowledge the course learning outcomes. Show evidence of analytical and critical planting in the course learning outcomes. Show evidence of some analytical and critical planting outcomes. Show evidence of some analytical and critical planting outcomes. Show evidence of some analytical and critical planting outcomes. Show evidence of some analytical and critical planting outcomes. Show evidence of some analytical and critical planting outcomes. Show evidence of some analytical and critical planting outcomes. Show evidence of some analytical and critical planting outcomes. Show evidence of some analytical and critical planting outcomes. Show evidence of some analytical and critical planting outcomes. Show evidence of some analytical and critical planting outcomes. Show evidence of some analytical and critical planting outcomes.	multivariate survival da urse; or tiingencies  Examination  Knowledge and skills require ies and logical thinking, with x, familiar and unfamiliar sit rand skills required for attainitical abilities and logical thiftective organizational and presentatio equired for attaining applicational and presentatio equired for attaining some of but with limited analytical	May  In door attaining all the nevidence of original uations. Apply highly ning at least most of inking, and ability to resentational skills.  If most of the course, and ability to apply nal skills.  If the course learning and critical abilities.		
(and Co-requisites and Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade	3. Analyz 4. Extend Pass in S Pass in S Y A+ to F A B C	The Cox's model to a multivariate setup to accommodate STAT3902 Statistical models, or already enrolled in this costa tatistical analysis or STAT3901 Life cord as models. The cord of the course learning outcomes. Show strong analytical and critical abilities thought, and ability to apply knowledge to a wide range of complete fective organizational and presentational skills.  Demonstrate substantial command of a broad range of knowledge the course learning outcomes. Show evidence of analytical and critical apply knowledge to familiar and some unfamiliar situations. Apply elearning outcomes. Show evidence of some analytical and critical knowledge to most familiar situations. Apply moderately effective organizations. Show evidence of some coherent and logical thinking. Show limited ability to apply knowledge to solve problems. Apply moderately effective organizations.	multivariate survival da urse; or tiingencies  Examination  Examinatio	May  In the newidence of original uations. Apply highly uning at least most of inking, and ability to resentational skills.  I most of the course, and ability to apply nal skills.  If the course learning and critical abilities, a organizational and the course learning or no ability to apply or no ability to apply or no ability to apply or no ability to apply or no ability to apply the new area.		

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 (%)
	Assignments	Coursework (assignments, tutorials, and a class test)	25
	Examination	One 3-hour written examination	75
Required/recommended reading and online materials	Hosmer, D. W. and Lemeshow, S.: Ap (Wiley, 1999)	Survival Data (Chapman and Hall, 1984) plied Survival Analysis: Regression Modeling Survival Analysis: Techniques for Censored ed.)	
Course Website	moodle.hku.hk		

STAT3956 Pension funds	and pension	on mathematics (6 credits)		Academic Year	2014	
Offering Department	Statistics	& Actuarial Science		Quota		
Course Co-ordinator	Prof G Ma	a, Statistics & Actuarial Science (gr	na328@hku.hk)			
Teachers Involved	Prof G Ma	a, Statistics & Actuarial Science				
Course Objectives	This course covers the basics of pension plan design and pension fund management, as well as fundamentals of pension plan valuations using different actuarial cost methods. The students will introduced to the application of actuarial valuation techniques to the funding and accounting of pens plans.					
Course Contents & Topics	pension of	The following topics will be covered: Fundamentals of private pension plans; pricing and valuation pension obligations; actuarial cost methods and their effects on cost patterns; selection of actuar assumptions; principles of asset and liability management.				
Course Learning Outcomes	1. Calcula 2. Calcula 3. Perforn 4. Select 5. Interpre	On successful completion of the course, students should be able to:  1. Calculate the pension benefits in accordance with the provisions of a pension plan. 2. Calculate the normal cost and actuarial liabilities using different actuarial cost methods. 3. Perform gain and loss analyses for pension valuations. 4. Select appropriate assumptions and methods for funding or accounting purposes. 5. Interpret the valuation results presented in actuarial valuation reports. 6. Understand the principles of asset and liability modeling as related to pension plans.				
Pre-requisites (and Co-requisites and mpermissible combination)	Pass in S	TAT3909 Advanced life contingend	ies			
Offer in 2014 - 2015	Y 1st	sem		Examination	Dec	
Offer in 2015 - 2016	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 commar outcomes. Show evidence of some co Show limited ability to apply knowledg presentational skills.	herent and logical thinking, bu	ut with limited analytica	l and critical abilities	
	Fail  Demonstrate little or no evidence of command of knowledge and skills required for attaining toutcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little convolvedge to solve problems. Organization and presentational skills are minimally effective or ine				e or no ability to apply	
Course Type	Lecture-b	ased course				
Course Teaching	Activitie	es	Details		No. of Hour	
& Learning Activities	Lectures				3	
	Tutorials				1	
		/ Self study			10	
Assessment Methods and Weighting	Methods	•	Details		Weighting in fina	
	Assignm	ents	Coursework (as tutorials, and a cla	ssignments,	2	

	Examination	One 3-hour written examination	75
Required/recommended reading and online materials	Arthur W. Anderson: Pension Mathematics for Ac McGill, D.M., Brown, K.N., Haley, J.J., Schieb Edition) William H. Aitken: Problem-Solving Approach to F Morneau Sobeco: Handbook of Canadian Pension Actuarial Standard of Practice No. 27, Selecti Obligations Actuarial Standard of Practice No. 35, Selection of Measuring Pension Obligations Actuarial Standard of Practice No. 44, Selectic Valuations David Farber, ASA, EA, MSPA, William Farrimor Actuarial Cost Methods-A Review, 3rd Edition, 19	er, S.J.: Fundamentals of Private Pension Funding and Valuation, (2nd n & Benefit Plans (2008, 14th Editio on of Economic Assumptions for of Demographic and Other Nonecon on and Use of Asset Valuation Mad, FSPA, Duane Mayer, MSPA, G 199, ACTEX Publications	d edition). n) Measuring Pension omic Assumptions for Methods for Pension
Course Website	moodle.hku.hk		

STAT4601 Time-series ar	, 0.0 (0 0	round,		Academic Year	2014	
Offering Department	Statistics	& Actuarial Science		Quota		
Course Co-ordinator	Dr G Li, S	Statistics & Actuarial Science (gd	li @hku.hk)			
Teachers Involved	Dr G Li, S	Statistics & Actuarial Science				
Course Objectives	naturally observati this. This processe	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		ity and the autocorrelation function; estimation and diagnostic				
Course Learning Outcomes	On succe	essful completion of the course, s	tudents should be able to:			
	2. Under: MA (mov 3. Transf 4. Identify 5. Fit a necessar 6. Perfori	<ol> <li>Recognize a stationary vs non-stationary time series.</li> <li>Understand some basic properties of commonly used time series models such as AR (autoregressive MA (moving average) and ARMA models.</li> <li>Transform non-stationary time series into stationary ones.</li> <li>Identify different time series models based on autocorrelation functions.</li> <li>Fit a suitable AR, MA or ARMA model to real data using SAS (after transforming to stationarity necessary).</li> <li>Perform goodness of fit tests for such models.</li> <li>Do forecasting with these fitted time series models.</li> </ol>				
Pre-requisites and Co-requisites and mpermissible combination)	Not for s course; a Not for s	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.				
Offer in 2014 - 2015	Y 1s	t sem		Examination	Dec	
Offer in 2015 - 2016	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	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 outcomes. Lack of analytical and cri knowledge to solve problems. Organ	tical abilities, logical and coherent	thinking. Show very little	or no ability to apply	
Course Type	Lecture-b	pased course				
Course Teaching	Activitie	9S	Details		No. of Hours	
& Learning Activities	Lectures				36	
	Tutorials				12	
		Reading / Self study				
	rteading	7 Och Study			100	

and Weighting			course grade (%)
	Assignments	Coursework (assignments, tutorials, and a class test)	40
	Examination	One 2-hour written examination	60
Required/recommended reading and online materials	Bovas Ábraham & Johannes Ledo edition) W. W .S. Wei: Time Series Analy edition) W. K. Li: Diagnostic Checks in Time	es Analysis with Applications in R (Springer, 2008, Iter: Statistical Methods for Forecasting (John Wilds: Sis: Univariate and Multivariate Methods (Addisone Series (Chapman & Hall/CRC, 2004) es: A Dynamical System Approach (Oxford University)	ey & Sons, 2005, 2nd n-Wesley, 2006, 2nd
Course Website	moodle.hku.hk		

STAT4602 Multivariate da	ta analysis	(o creaits)	Acade	emic Year	2014	
Offering Department	Statistics	& Actuarial Science	Quota	1	6	
Course Co-ordinator	Prof T W I	K Fung, Statistics & Actuarial Science (wingf	fung @hku.hk)			
Teachers Involved	Prof T W I	K Fung, Statistics & Actuarial Science				
Course Objectives	where each are often course de	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	sample. T	with multivariate data. Multivariate norr Fests of covariance matrix. Correlations: S n. Principal components analysis. Facto Multivariate analysis of variance. Discrin	Simple, partial, multiple r analysis. Problems	and canon for mean	ical. Multivariate s of several	
Course Learning Outcomes	On succes	ssful completion of the course, students shou	uld be able to:			
	PROC CA 2. Compa multivariat 3. Investi canonical 4. Explore analysis a	<ol> <li>Analyze multivariate data with main SAS procedures, such as PROC IML, PROC REG, PROC COR PROC CANCORR, PROC PRINCOMP, PROC FACTOR, PROC DISCRIM, PROC CANDISC and etc.</li> <li>Compare the mean structure of multiple measurements for one or more than one population(s) multivariate MANOVA and profile analysis.</li> <li>Investigate the linear associations among one/two group(s) of variables by multiple, partial arcanonical correlation and multivariate regression.</li> <li>Explore the latent linear structure of a data set with multiple measurements by principal componer analysis and factor analysis.</li> <li>Classify observations of a population with one or more than one measurements by discrimina analysis.</li> </ol>				
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in S	Pass in STAT3600 Linear statistical analysis or STAT3907 Linear models and forecasting				
Offer in 2014 - 2015	Y 2nd	Isem	Exam	ination	May	
Offer in 2015 - 2016	Υ					
Course Grade	A+ to F					
Grade Descriptors	Α	Demonstrate thorough mastery at an advanced leve course learning outcomes. Show strong analytical athought, and ability to apply knowledge to a wide reffective organizational and presentational skills.	and critical abilities and logic	al thinking, with	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.					
	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	ased course				
	Activities	s Det	tails		No. of Hours	
					36	
	Lectures					
					12	
Course Teaching & Learning Activities	Tutorials	/ Self study			12 100	

	Assignments	tutorials, and a class test)	50
	Examination	One 3-hour written examination	50
Required/recommended reading and online materials	Johnson, R. A. & Wichern, D. W.: Applied Mu Mardia K. V., Kent J. T., and Bibby J. M.: Mul Seber G. A. F.: Multivariate Observations (Jo Morrison D. F.: Multivariate Statistical Method Hair J. F., Anderson R. E., Tatham R. L., & 6th edition) Srivastava M. S.: Methods of Multivariate Sta SAS Manuals on-line: Use the HELP button.	tivariate Analysis (Academic Press, 1979) hn Wiley & Sons, 1984) ls (McGraw-Hill, 1990, 3rd ed.) Black W. C.: Multivariate Data Analysis (Prei	,
Course Website	moodle.hku.hk		

STAT4603 Current topics	in risk man	agement (6 credits)	A	cademic Year	2014	
Offering Department	Statistics 8	& Actuarial Science	Q	uota		
Course Co-ordinator	TBC, Stati	stics & Actuarial Science ()				
Teachers Involved						
Course Objectives	managem	e is to broaden the students knowledgent. These topics will build on the the ch year depend on staff availability.				
Course Contents & Topics		isk; BASEL III and beyond; Operati s in risk management.	onal risk; Model risk; C	Cutting edge ris	k analytics and	
Course Learning Outcomes	On succes	ssful completion of the course, students	s should be able to:			
	<ol><li>Underst</li></ol>	sights into current advances in risk man and current risk management pitfalls a ffective use of models and techniques	and development.	ds of risk.		
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in S	ass in STAT4601 Time-series analysis				
Offer in 2014 - 2015	N	Examination				
Offer in 2015 - 2016	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.					
	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 comma outcomes. Lack of analytical and critical abili knowledge to solve problems. Organization a	ties, logical and coherent thinki	ng. Show very little	or no ability to apply	
Course Type	Lecture-ba	ased course				
Course Teaching	Activities	3	Details		No. of Hours	
& Learning Activities	Lectures				36	
	Tutorials				12	
	Reading / Self study				100	
Assessment Methods and Weighting	Methods		Details		eighting in fina ourse grade (%	
	Assignme	ents	Coursework (assign tutorials and class test)	nments, (s))	60	
	Examinat	ion	One 3-hour written exa	mination	40	
Required/recommended reading and online materials	Dowd, K: Measuring Market Risk. 2nd Edition (Wiley, 2005). (Chapters 14, 16) Fiedler, R.: Liquidity Modelling. (Risk Books, 2011) Franzetti, C.: Operational Risk Modeling and Management. (Chapman & Hall/CRC Finance Series, 2010) Basel Committee on Banking Supervision:Basel III: International Framework for liquidity risk measuremer standards and monitoring (BIS, 2010) Basel Committee on Banking Supervision:Basel III: A global regulatory framework for more resilient bank					
		ng systems (BIS, 2010)	/ t g.oba. rogulatory			

Offering Department Course Co-ordinator	Statistics &	P. Astustial Caionas	0			
		& Actuarial Science	Quota			
	Mr P K Y I	Pang, Statistics & Actuarial Science (the_	pang@yahoo.com)			
Teachers Involved	Mr P K Y I	Pang, Statistics & Actuarial Science				
Course Objectives	finance in forming a	To provide comprehensive knowledge and in-depth understanding of risk management in the banking and finance industry to students. The focus is on management with basic measurement fundamentals only forming a part of the course. Accordingly, minimal background in quantitative methods will be required and involved. However, basic financial product (eg: bonds, swaps, options) knowledge will be required.				
Course Contents & Topics	- the impo - risk natu - design a - the impo - the comp - measure - Basel ac - key dev issues, - the impo	<ul> <li>- the importance of business continuity,</li> <li>- design and implementation of a business continuity plan.</li> </ul>				
Course Learning Outcomes	industry):  1. Unders principle a 2. Design 3. Demons 4. Explain	On successful completion of the course, students should be able to (in the context of banking and finance industry):  1. Understand the importance, nature and classification of various risks, and the risk management principle and cycle.  2. Design and establish a risk management framework.  3. Demonstrate knowledge and understanding of the measurements of credit, market and operational risks.  4. Explain and describe Basel accords and its capital treatments for credit, market and operational risks.  5. Appreciate the importance of, design and implement a business continuity plan.				
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in S Derivative	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).				
Offer in 2014 - 2015	Y 2nd	sem	Examinatio	n May		
Offer in 2015 - 2016	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.					
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.				
	Fail  Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.					
Course Type	Lecture-ba	ased course				
Course Teaching	Activities	s [	Details	No. of Hours		
& Learning Activities	Lectures			36		
	Tutorials			12		
	Reading	Self study		100		
Assessment Methods and Weighting	Methods	1	Details	Weighting in fina course grade (%		
	Assignme	ante	Coursework (assignments, utorials, and a class test)	40		
	Examinat	ion C	One 2-hour written examination	60		
Required/recommended reading and online materials	Jorion, P.: Hull, J. C.:	., Galai, D. and Mark, R.: The Essentials Financial Risk Manager Handbook + Tes Risk Management and Financial Institution Risk Management and Capital Adequacy	st Bank: FRM part I/Part II (Wile ons (Pearson Higher Education	y, 2010, 6th edition)		
Course Website	moodle.hk	u.hk				

STAT4607 Credit risk ana		<del>-</del>			2014	
Offering Department		& Actuarial Science		Quota		
Course Co-ordinator		at, Statistics & Actuarial Science (wa	atkp@hku.hk)			
Teachers Involved		at, Statistics & Actuarial Science				
Course Objectives	swap, or or resulting find quantitative understand	For a commercial bank, credit risk has always been the most significant. It is the risk of default on debt swap, or other counterparty instruments. Credit risk may also result from a change in the value of an asse resulting from a change in the counterparty's creditworthiness. This course will introduce students to quantitative models for measuring and managing credit risk. It also aims to provide students with an understanding of the credit risk methodology used in the financial industry and the regulatory framework in which the credit risk models operate.				
Course Contents & Topics	and intern	es of default, recovery rates and log nal rating models; Credit portfolio mapproach; Credit derivatives.				
Course Learning Outcomes	On succes	ssful completion of the course, stude	ents should be able to:			
	<ol> <li>Estimate</li> <li>Understant</li> <li>Understant</li> <li>Understant</li> <li>Estimate</li> </ol>	Understand the Basel requirements for credit risk.     Estimate credit scores using the logit model.     Understand and estimate default probabilities using various approaches such as Moody's, the KN the mortality method.     Understand the concept of credit value-at-risk and the CreditMetrics approach.     Estimate default correlations.     Assess rating systems.				
Pre-requisites (and Co-requisites and Impermissible combination)	managem	Pass or already enrolled in STAT3910 Financial economics I or STAT3618 Derivatives and management or STAT3905 Introduction to financial derivatives or (FINA2322 Derivatives and University level 3 course)				
Offer in 2014 - 2015	Y 2nd	sem		Examination	May	
Offer in 2015 - 2016	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 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  Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.					
Course Type	Lecture-ba	ased course				
Course Teaching	Activities	S	Details		No. of Hours	
& Learning Activities	Lectures				36	
	Tutorials				12	
	Reading /	/ Self study			100	
Assessment Methods and Weighting	Methods	·	Details		Weighting in fina course grade (%)	
	Assignme	ents	Coursework (as tutorials, and class	signments, test(s))	40	
	Examinat	tion	One 2-hour written	examination	60	
	Resti, A. and Sironi, A. (2007). Risk Management and Shareholders' Value in Banking: From F Measurement Models to Capital Allocation Policies. Wiley.  Saunders, A. and Allen, L. (2010). Credit Risk Measurement In and Out of the Financial Crisis: Napproaches to Value at Risk and Other Paradigms (3rd Edition). Wiley.  Loffler, G. and Posch, P. N. (2010). Credit Risk Modeling using Excel and VBA (2nd Edition). Wiley.  Jorion, P. (2011). Financial Risk Manager Handbook (6th Edition). Wiley.  Crouhy, M., Galai, D., and Mark, R. (2001). Risk Management. McGraw-Hill.  Hull, J. C. (2012). Risk Management and Financial Institutions (3rd Edition). Wiley.  Hull, J. C. (2012). Options, Futures, and Other Derivatives (8th Edition). Prentice Hall.  Gujarati, D. N. and Porter, D. C. (2009). Basic Econometrics (5th Edition). McGraw-Hill.  Bohn, J. R. and Stein, R. M. (2009). Active Credit Portfolio Management in Practice. Wiley.			nking: From Risk		
Required/recommended reading and online materials	Measurem Saunders, Approache Loffler, G. Jorion, P. Crouhy, M Hull, J. C. Hull, J. C. Gujarati, E Bohn, J. R	nent Models to Capital Allocation Pol., A. and Allen, L. (2010). Credit Res to Value at Risk and Other Parad and Posch, P. N. (2010). Credit Ris (2011). Financial Risk Manager Han I., Galai, D., and Mark, R. (2001). Risk Management and Fina (2012). Options, Futures, and Other D. N. and Porter, D. C. (2009). Basic	licies. Wiley. Lisk Measurement In an ligms (3rd Edition). Wiley is Modeling using Excel adbook (6th Edition). Wiley is Management. McGraincial Institutions (3rd Edit or Derivatives (8th Edition) is Econometrics (5th Editiedit Portfolio Manageme	od Out of the Final and VBA (2nd Ediney). w-Hill. ition). Wiley. ). Prentice Hall. on). McGraw-Hill.	tion). Wiley.	

STAT4608 Market risk analy	sis (6 credits)	Academic Year	2014

Offering Department	Statistics 8	& Actuarial Science		Quota		
Course Co-ordinator	Dr Z Zhan	g, Statistics & Actuarial Science (zhan	gz08@hku.hk)			
Teachers Involved	Dr Z Zhan	g, Statistics & Actuarial Science				
Course Objectives	new meth	inancial risk management has experienced a revolution in the last decade thanks to the introduction of ew methods for measuring risk, particularly Value-at-Risk (VaR). This course introduces modern risk lanagement techniques covering the measurement of market risk using VaR models and financial time eries models, and stress testing.				
Course Contents & Topics	simulation	sures; Value-at-Risk (VaR) models ); Risk factor mapping; Advanced VaR xture); Principal Component Analysis a	models (GARCH-ty	pe models, extrem	e-value theory and	
Course Learning Outcomes	1. Underst 2. Comput 3. Model v 4. Underst	On successful completion of the course, students should be able to:  1. Understand VaR and expected shortfall as risk measures. 2. Compute VaR and expected shortfall. 3. Model volatility using GARCH-type models. 4. Understand extreme-value theory. 5. Understand backtesting and stress testing.				
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in S	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 Partistics of investment risk)]				
Offer in 2014 - 2015	Y 2nd	sem		Examination	May	
Offer in 2015 - 2016	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.					
	<b>B</b> Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.					
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.				
	D	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 commo outcomes. Lack of analytical and critical abili knowledge to solve problems. Organization a	ties, logical and coherent	thinking. Show very litt	le or no ability to apply	
Course Type	Lecture-ba	ased course				
Course Teaching	Activities	3	Details		No. of Hours	
& Learning Activities	Lectures				36	
	Tutorials				12	
	Reading /	Self study			100	
Assessment Methods and Weighting	Methods		Details		Weighting in final course grade (%)	
	Assignme	ents	Coursework (a tutorials, and a cla	ssignments,	40	
	Examinat	ion	One 2-hour writter	n examination	60	
Required/recommended reading and online materials	edition) Alexander Alexander Alexander	: Value-at-Risk: The New Benchmar , C.: Market Models: A Guide to Finand , C.: Market Risk Analysis: Practical Fi , C.: Market Risk Analysis: Value-at-Ri .: Analysis of Financial Time Series (W	cial Data Analysis (W nancial Econometric sk Models (Wiley, 20	/iley, 2001) s (Wiley, 2008) 009)	aw-Hill, 2007, 3rd	
Course Website	moodle.hk	` ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` `	• • • • • • • • • • • • • • • • • • •	•		
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STAT4710 Capstone experience for statistics/risk management undergraduates (6 credits)		Academic Year	2014		
Offering Department	Statistics & Actuarial Science	Quota			
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 investiga real life problems in the area of statistics, risk management, finance, climate, social science, medicine as scientific research by integrating and applying the statistical theories and quantitative techniques learnt their junior university years.				
Course Contents & Topics	No formal teaching. Students are expected to devote 120-140	hours working on this project	t. Students wi		

	work in groups of four or five under the supervision of a teacher. Students are required to give presentation on their work two to three weeks before the end of the semester, and submit their final reat the end of the semester.  It aims to help the students to establish a good and solid foundation of life-long learning skills, and 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, techn report writing and presentation of the results. Students will need to find an interesting topic of their of conduct literature search regarding the most recent research related to the problem, make suggestion improve the current situations or even solve the problem identified in their project.  On successful completion of the course, students should be able to:				
Course Learning Outcomes	On successful completion of the course, students should be able to:  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.  2. integrate theory and practice, and to understand limitations of their current knowledge.  3. work in a team and to collaborate with people with different background.  4. express ideas effectively in both written and oral forms.  5. develop further logical, critical thinking, creativity, technical report writing, communication and consultation skills.  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 combination)	Students a STAT4XXX who are in	Students are expected to have satisfactorily completed at least 24 credits of advanced level (STAT3XXX, STAT4XXX or STAT6XXX) compulsory/core courses in 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 Risk Management, and Statistics Majors students only.			
Offer in 2014 - 2015	N		Examination	ı	
Offer in 2015 - 2016	Υ	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.				
	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	outcomes. Lack of analytical and critical abili	and of knowledge and skills required for atta ties, logical and coherent thinking. Show very and presentational skills are minimally effective	little or no ability to apply	
Course Type	Project-bas	sed course			
	· ·			No. of Hours	
Course Teaching & Learning Activities	Activities		Reading / Self study  Tutorials, group work/project, reading/self-study		
Course Teaching & Learning Activities				120	
	Reading /	Self study	reading/self-study  Details	Weighting in final course grade (%)	
& Learning Activities  Assessment Methods	Reading /	Self study	reading/self-study	Weighting in final	
& Learning Activities  Assessment Methods	Reading /  Methods  Research  No specific	Self study	Details  Continuous assessment  udents are encouraged to obtain in:	Weighting in final course grade (%) 100 formation via various	

STAT4711 Capstone experies;	perience for actuarial science undergraduates (6	Academic Year	2014		
Offering Department	Statistics & Actuarial Science	Quota			
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 investigate practical problems in actuarial science by integrating and applying actuarial theories and techniques learnt in their university years. It aims to help the students to establish a good and solid foundation of self-learning skills, and to enable students to equip with hands-on experience in solving practical problems including definition of the problem, designing the solution, and presentation of the results.				
Course Contents & Topics	No formal teaching will be given for this course. Students are expected to devote 120-140 hours working this project. Students will work in groups of four or five under the supervision of a teacher and/or an indusupervisor. Students are required to give a presentation on their work two to three weeks before the end of semester, and submit their final report at the end of the semester.				
Topics acceptable for projects in this course can be related to any of the traditional actuarial areas of					

Course Learning Outcomes	Students suitable to Department Students activities On succession 1. define solutions 2. integra 3. work in 4. deliver	life insurance, pension, finance, investment, enterprise risk managents are also encouraged to suggest topics in non-traditional actuarial are teacher and/or industry supervisor. All topics for this course will be sultent to ensure relevance to actuarial science.  It will need to decide on the topic for a practical project, conduct marker related to the topic, and make suggestion on a solution of the problem ic essful completion of the course, students should be able to:  It a practical problem, discuss the issues faced by different stakehous for the problems. The problems are team and to collaborate with members with different background. It actuarial results effectively in a written report and in oral presentations opporturither logical, critical thinking, creativity, technical report writing, contributions of the problem is a team and to collaborate with members with different background.	eas provided abject to final at research redentified in the color, and constructions of current descriptions.	they can find a approval by the egarding industry eir project.  design workable evelopments.		
		n to a non-actuarial audience the approaches of actuarial science as app system.	olied to proble	ems in a financial		
Pre-requisites (and Co-requisites and Impermissible combination)	STAT6XX enrolled i Pass in S	Pass in at least 24 credits of advanced level compulsory/core 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.				
Offer in 2014 - 2015	N	Exan	mination			
Offer in 2015 - 2016	Y	'		'		
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 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.				
		skills.	g	and presentational		
	Fail	skills.  Demonstrate little or no evidence of command of knowledge and skills required outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Sh knowledge to solve problems. Organization and presentational skills are minimally effective.	d for attaining t	he course learning r no ability to apply		
Course Type		Demonstrate little or no evidence of command of knowledge and skills required outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Sh	d for attaining t	he course learning r no ability to apply		
Course Teaching		Demonstrate little or no evidence of command of knowledge and skills required outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Sh knowledge to solve problems. Organization and presentational skills are minimally effect or asset course.	d for attaining t	he course learning r no ability to apply		
	Project-b  Activitie	Demonstrate little or no evidence of command of knowledge and skills required outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Sh knowledge to solve problems. Organization and presentational skills are minimally effect or asset course.	d for attaining t now very little or ective or ineffect	he course learning r no ability to apply ive.		
Course Teaching	Project-b  Activitie	Demonstrate little or no evidence of command of knowledge and skills required outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Sh knowledge to solve problems. Organization and presentational skills are minimally effect passed course  Bes Details  Tutorials, group work/pr reading/self-study	d for attaining the new very little of ective or ineffect roject,	he course learning r no ability to apply ive.		
Course Teaching & Learning Activities  Assessment Methods	Project-b  Activitie  Reading	Demonstrate little or no evidence of command of knowledge and skills required outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Sh knowledge to solve problems. Organization and presentational skills are minimally effect or sees.  Details  Jeff Study  Details  Details  Details	d for attaining the new very little of ective or ineffect roject,	he course learning r no ability to apply ive.  No. of Hours  120  eighting in final		

STATE OU STATISTICS TITLET	nship (6 credits)	Academic Year	2014	
Offering Department	Statistics & Actuarial Science	Quota		
Course Co-ordinator	Dr P L H Yu, Statistics & Actuarial Science (plhyu@hku.hk)			
Teachers Involved	Various teachers as the assessors of oral presentations and writter	reports, Statistics &	Actuarial Science	
Course Objectives	This course is offered to students majoring in Statistics or Risk Mar take on a minimum of 160 hours of internship work related to his with first-hand experience in the applications of academic knowledge.	major disciplines. It		
Course Contents & Topics	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/education experiences encountered by the student during his/her internship. In many situations, this would mean report of the project(s) that the student has been involved in during his/her internship.			
Course Learning Outcomes	On successful completion of the course, students should be able to	:		

Pre-requisites (and Co-requisites and Impermissible combination)	Pass in at least 24 credits of advanced level compulsory/core courses (STAT3XXX, STAT4XXX or STAT6XXX) in the Risk Management, and Statistics Majors.  Students are expected to have satisfactorily completed their Year 3 study.  This capstone course is for Risk Management, and Statistics Majors students only.			
Offer in 2014 - 2015	Y 2nd	sem Summer	Examination	No Exam
Offer in 2015 - 2016	Υ		'	'
Course Grade	Pass/Fail			
Grade Descriptors	Pass	Able to apply knowledge to solve problems in in the job or assigned by supervisor(s). Esta colleagues, and clients in the job. Successful working hours, written and oral report, and performance in the above would be awarded a	blishes effective collaboration and commun ly fulfills the requirements set out in the Col evaluation by supervisor(s), etc. Students	ication with supervisor(s), urse Description regarding
	Fail	Very limited or no ability to solve problems in or assigned by supervisor(s). Fails to establi colleagues, or clients in the job. Fails to satisf hours, written and oral report, or evaluation by	sh effective collaboration or communication y the requirements set out in the Course Des	with supervisor(s), other
Course Type	Internship			
Course Teaching	Activities		Details	No. of Hours
& Learning Activities	Internship	work	it is expected that students are to work at least 160 hours (or the equivalent of 4 weeks full-time)	160
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)
	Written report		written report, employer's feedback and oral presentation	100
Required/recommended reading and online materials	presentation performance	pletion of the internship, each student on on their internship experience. See during the internship period (in the will assess the student based on the fe	Supervisors will assess the stude e case of internships outside the u	ents based on their niversity, the internal
Course Website	moodle.hku	ı.hk		
Additional Course Information	to those wh Satisfactor internship Distinction" obtain the a Enrolment	of this course is not conducted via the relevant Department/School office	counted towards the Capstone rec script. This course will be assesse o enrol in this course should conta ne online course selection system	quirement. Details of don "Pass, Fail and act the Department to and should be made

STAT4767 Actuarial scien	nce intern	ship (6 credits)	Academic Year	2014	
Offering Department	Statistics	& Actuarial Science	Quota		
Course Co-ordinator	Dr L F K	Ng, Statistics & Actuarial Science (flouisng@hku.hk)			
Teachers Involved	Various to	eachers as the assessors of oral presentations and written re	eports, Statistics & A	ctuarial Science	
Course Objectives		This course is offered to actuarial science students who take on an 6-month full time or simila internships. The objective is for a student to complete this course as a project based on his/her internship.			
Course Contents & Topics	encounte	se will include a written report which should emphasize impred by the student during his/her internship. In many situathat the student has been involved in during his/her internsh	ations, this would me		
Course Learning Outcomes	1. Gain p 2. Describ 3. Explair	essful completion of the course, students should be able to: ractical experiences during internship. De basic actuarial practices learned during the internship. In how actuarial theories learned in University can be applied	in practice.		
	4. Provide	e context for specific technical skills developed in basic actua	arial courses.		
(and Co-requisites and	Pass in STAT6XX	e context for specific technical skills developed in basic actual at least 24 credits of advanced level compulsory/core (X) in BSc(Actuarial Science) programme including STAT39 stone course is for BSc(Actuarial Science) students only.	courses (STAT3XX		
(and Co-requisites and mpermissible combination)	Pass in STAT6XX	at least 24 credits of advanced level compulsory/core (X) in BSc(Actuarial Science) programme including STAT39	courses (STAT3XX		
(and Co-requisites and Impermissible combination) Offer in 2014 - 2015	Pass in STAT6XX This caps	at least 24 credits of advanced level compulsory/core (X) in BSc(Actuarial Science) programme including STAT39 stone course is for BSc(Actuarial Science) students only.	courses (STAT3XX 01 Life contingencies	s; and	
(and Co-requisites and Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016	Pass in STAT6XX This caps Y 2nd	at least 24 credits of advanced level compulsory/core (X) in BSc(Actuarial Science) programme including STAT39 stone course is for BSc(Actuarial Science) students only.	courses (STAT3XX 01 Life contingencies	s; and	
Pre-requisites (and Co-requisites and Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade Grade Descriptors	Pass in STAT6X> This caps Y 2nd Y	at least 24 credits of advanced level compulsory/core (X) in BSc(Actuarial Science) programme including STAT39 stone course is for BSc(Actuarial Science) students only.	courses (STAT3XX 01 Life contingencies  Examination  ully handles and carries of contain and communication and communication as set out in the Course	No Exam  No Exam  but the work required in on with supervisor(s), Description regarding	

Course Type	Internship		
Course Teaching & Learning Activities	Activities	Details	No. of Hours
a Learning Activities	Internship work	it is expected that students are to work at least 160 hours (or the equivalent of 4 weeks full-time)	
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)
	Written report	written report, employer's feedback and oral presentation	100
Course Website	moodle.hku.hk		
Additional Course Information	those who have completed Year 2. Satisfactory completion of this cours internship will be recorded on the st Distinction" basis. Students who are obtain the approval.  Enrolment of this course is not cond	ctorily completed their Year 3 study. Special consecution of the Capstone resudent's transcript. This course will be assessing interested to enrol in this course should contiducted via the online course selection systems chool office after approval has been obtain	equirement. Details of ed on "Pass, Fail and act the Department to and should be made

	ictuariai s	cience project (6 credits)	Ac	ademic Year	2014	
Offering Department	Statistics 8	& Actuarial Science	Qu	ota		
Course Co-ordinator	Prof S M S	Lee, Statistics & Actuarial Science (sms	slee@hku.hk)			
Teachers Involved	Various te	achers as the assessors of oral presenta	tions and written reports, S	Statistics & Actu	uarial Science	
Course Objectives		Each year a few projects suitable for Actuarial Science students will be offered to provide students with practical experience in approaching a real problem, in report writing and in oral presentation.				
Course Contents & Topics	These projects, under the supervision of individual staff members, involve the applications of statistics and/or probability in a wide range of problems of practical and/or academic interests.					
Course Learning Outcomes	1. Formula 2. Learn a	On successful completion of the course, students should be able to:  1. Formulate meaningful research problems. 2. Learn and apply advanced techniques in probability and/or statistics to solve real life problems. 3. Summarize and present research findings in a professional manner.				
Pre-requisites (and Co-requisites and Impermissible combination)	STAT6XX Linear mod Pass or al STAT3911 and	Pass in at least 24 credits of advanced level compulsory/core 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;				
Offer in 2014 - 2015	N		Exa	amination		
Offer in 2015 - 2016	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.					
	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 of analytical and critical abilities, logical and comparison of them. Misuse of data and resu presentational skills are minimally effective or in	coherent thinking. Limited use of Its and/or unable to draw appro	of secondary sour	ces and no critical	
Course Type	Project-ba	sed course				
	Activities		Details		No. of Hours	
Course Teaching	Reading / Self study				120	
Course Teaching & Learning Activities	Reading /					

	Oral presentation	discussion	50
	Research report	written report	50
Course Website	moodle.hku.hk		
Additional Course Information	Approval is subject to past academic performance	ce.	

STAT4799 Statistics proje	ect (12 cre	dits)	Academic Ye	ear 2014	
Offering Department	Statistics 8	& Actuarial Science	Quota	15	
Course Co-ordinator	Prof S M S	S Lee, Statistics & Actuarial Science (sm	slee@hku.hk)		
Teachers Involved	Various te	achers as the assessors of oral presenta	ations and written reports, Statistics &	Actuarial Science	
Course Objectives		ach year a few projects suitable for Statistics or Risk Management major students will be offered to provide udents with practical experience in approaching a real problem, in report writing and in oral presentation.			
Course Contents & Topics		jects, under the supervision of individ bability in a wide range of problems of p		ications of statistics	
Course Learning Outcomes	Gain first     Develop statistical in the state of t	On successful completion of the course, students should be able to:  1. Gain first-hand experience in solving a research or applied problem in statistics or related areas.  2. Develop skills in important technical tools, including the use of computer software or programs, for typical statistical research and data analyses.  3. Write succinct reports on the findings of a research study.  4. Make concise oral presentation of the findings of a research study.			
Pre-requisites (and Co-requisites and Impermissible combination)	STAT6XX Pass or al STAT3911 and Not for stu	Pass in at least 24 credits of advanced level compulsory/core courses (STAT3XXX, STAT4XXX or STAT6XXX) in the Major in Risk Management / Statistics 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			
Offer in 2014 - 2015	N		Examination		
Offer in 2015 - 2016	Υ	Υ			
Course Grade	A+ to F				
Grade Descriptors	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.]      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 Demonstrate partial but limited grasp, with retention of some relevant information, of the subject. Evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Demonstrate use and reference of several sources, but mainly through summary rather than analysis and comparison. Limited ability to use data and results to draw appropriate conclusions. Apply limited or barely effective organizational and presentational skills.				
	Fail  Demonstrate evidence of little or no grasp of the knowledge and understanding of the subject. Evidence of little or lack of analytical and critical abilities, logical and coherent thinking. Limited use of secondary sources and no critical comparison of them. Misuse of data and results and/or unable to draw appropriate conclusions. Organization and presentational skills are minimally effective or ineffective.				
Course Type	Project-ba	sed course			
Course Teaching	Activities		Details	No. of Hours	
& Learning Activities	Reading /	Self study	the student is expected to meet & discuss with a supervisor regularly in the course of the project	240	
Assessment Methods and Weighting	Methods		Details	Weighting in fina course grade (%)	
	Dissertati	on	written report	50	
	Oral pres	entation	oral presentation & in-class discussion	50	
Course Website	moodle.hk	u.hk			
		s subject to past academic performance.			

STAT4901 Risk theory II (6 o	redits)	Academic Year	2014

Offering Department	Statistics	& Actuarial Science		Quota		
Course Co-ordinator	Dr J K Wo	oo, Statistics & Actuarial Science (jkwo	o @hku.hk)			
Teachers Involved	Dr J K Wo	oo, Statistics & Actuarial Science				
Course Objectives		se is an advanced course in risk theor s utility theory, ruin theory, aggregate cl			ed in STAT3906. It	
Course Contents & Topics	coefficien	Utility theory; discrete ruin model; compound Poisson risk model; ruin probability; reinsurance; adjustment coefficient; Lundbergs inequality; Tijms approximation; non-homogeneous birth process; contagion model; mixed Poisson process; inflation model; IBNR (Incurred But Not Reported) claims; mixed Erlang distributions; stop-loss moments; equilibrium distributions.				
Course Learning Outcomes	On succe	ssful completion of the course, student	s should be able to:			
	<ol> <li>Understand utility theory including some commonly used utility functions, Jensens inequality, aversion and utility maximization.</li> <li>Define discrete and continuous ruin models.</li> <li>Calculate the adjustment coefficient, Lundbergs inequality and Tijms approximation in ruin theory.</li> <li>Understand the effect of reinsurance and change of parameters on ruin probability.</li> <li>Understand non-homogeneous birth process and its applications as contagion models for of frequencies.</li> <li>Understand mixed Poisson process and its applications including the inflation model and the I model.</li> <li>Derive the relationship between stop-loss moments and equilibrium distributions.</li> </ol>					
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in S	TAT3906 Risk theory I				
Offer in 2014 - 2015	Y 2nd	2nd sem Examination May			May	
Offer in 2015 - 2016	Υ					
Course Grade	A+ to F					
Grade Descriptors		Demonstrate thereugh meetens et an educa	and lavel of avtancive know	uladga and akilla raqui	rad for attaining all tha	
arade 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	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-b	ased course				
Course Teaching	Activitie	s	Details		No. of Hours	
& Learning Activities	Lectures				36	
	Tutorials				12	
	Reading	/ Self study			100	
Assessment Methods and Weighting	Methods	3	Details		Weighting in final course grade (%)	
	Assignm	ents	Coursework (as tutorials, and a class	ssignments, ss test)	25	
	Examina	tion	One 3-hour written	examination	75	
Required/recommended reading and online materials	2007, 3rd Kaas R., edition). Bowers N 2nd editio	Bowers N.L., Gerber H.U., Hickman J.C. & Jones D.A.: Actuarial Mathematics (Society of Actuaries, 1997, 2nd edition). Willmot G.E. & Lin X.S.: Lundberg Approximations for Compound Distributions with Insurance Applications				
	(Springer,	= = = = = = = = = = = = = = = = = = =				

STAT4902 Selected topics in actuarial science (6 credits)		Academic Year	2014	
Offering Department	Quota			
Course Co-ordinator	TBC, Statistics & Actuarial Science ()	TBC, Statistics & Actuarial Science ()		
Teachers Involved	TBC, Statistics & Actuarial Science	TBC, Statistics & Actuarial Science		
Course Objectives	This course is an advanced course in actuarial science which d	iscusses selected topics	which potential	

		students will find useful. It focuses o on applications.	n tools that are in the frontier	of actuari	al science with	
Course Contents & Topics	The contents will be chosen from the following topics: Coherent risk measures; Premium calculation principles; Copulas; Extreme value theory; Stochastic dominance; Ordering of risks; Renewal equations with insurance applications; Reliability properties; Generalized linear models; Comonotonicity; Measures of dependency; Phase-type distributions; Applications to enterprise risk analysis; Other topics as determined by the instructor.					
Course Learning Outcomes	On succe	ssful completion of the course, students	s should be able to:			
		<ol> <li>Understand the mathematical tools useful for further research and applications.</li> <li>Apply the tools to solve potentially unseen problems.</li> </ol>				
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in S	TAT3906 Risk theory I				
Offer in 2014 - 2015	N	N Examination				
Offer in 2015 - 2016	N	N				
Course Grade	A+ to F					
Grade Descriptors	A	Demonstrate thorough mastery at an advanc course learning outcomes. Show strong ana thought, and ability to apply knowledge to a effective organizational and presentational sk	lytical and critical abilities and logical th wide range of complex, familiar and un	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	Demonstrate little or no evidence of commoutcomes. Lack of analytical and critical ability knowledge to solve problems. Organization a	ities, logical and coherent thinking. Show	v very little o	r no ability to apply	
Course Type	Lecture-b	ased course				
Course Teaching	Activitie	s	Details		No. of Hours	
& Learning Activities	Lectures				36	
	Tutorials				12	
	Reading	/ Self study			100	
Assessment Methods and Weighting	Methods	· · · · · · · · · · · · · · · · · · ·	Details		eighting in final ourse grade (%)	
	Assignm	ents	Coursework (assignments, tutorials and class test(s))		40	
	Examina	tion			60	
Required/recommended reading and online materials	edition) Denuit Nedition) Willmot Applicatio - McNeil A	<ul> <li>- Kaas R., Goovaerts M., Dhaene J., &amp; Denuit M.: Modern Actuarial Risk Theory (Springer, 2004, 1st edition).</li> <li>- Denuit M., Dhaene J., Goovaerts M., &amp; Kaas R.: Actuarial Theory for Dependent Risks (Wiley, 2005, 1st</li> </ul>				
Course Website	moodle.hl	ku.hk				

STAT4903 Actuarial techn	「AT4903 Actuarial techniques for general insurance (6 credits)						
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 techniques for ratemaking and estimating claim liabilities for general insurance. Application of the actuarial techniques to resolve general insurance problems will be emphasized. The course also provides general knowledge on the general insurance markets in Hong Kong and China. Students will acquire the fundamental concept on general insurance actuarial science together with the supporting calculations.						
Course Contents & Topics	actuarial science together with the supporting calculations.  1. General Insurance Markets in Hong Kong, Taiwan and PRC - Introduction of general insurance markets - Regulations on general insurance  2. Basic techniques for ratemaking - How to read and use manual rate pages - Ratemaking related to exposures						

	- Ratemak - Calculate - Pure pre - Loss Rat - Rating di - Consider  3. Estimat - Data req - Build and - Reservin - Consider - Estimate - Appraise	ring related to premiums ring related to loss and loss adjustment to the underwriting expense provisions mium methods io methods fferential and relativities rations when selecting the final rates ring claim liabilities uirement d analyze claim development triangles g techniques rations when estimating the claim liabili recoveries and unpaid claim adjustme and validation of the estimated results rent topics Applications using predictive ictive modeling, Enterprise Risk Manace	ties nt expenses is e modeling in General	Insurance		
Course Learning Outcomes	On succes  1. understa 2. calculate	sful completion of the course, students and the feature and underlying risk of get the premium rate for basic general inset the claims liabilities for general insural	should be able to: eneral insurance products	lucts		
Pre-requisites (and Co-requisites and Impermissible combination)		AT3906 Risk theory I	nice products			
Offer in 2014 - 2015	N			Examination		
Offer in 2015 - 2016	Υ			1		
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 commar outcomes. Lack of analytical and critical abiliti knowledge to solve problems. Organization an	es, logical and coherent th	inking. Show very little	or no ability to apply	
Course Type	Lecture-ba	sed course				
Course Teaching	Activities		Details		No. of Hours	
& Learning Activities	Lectures				36	
	Tutorials				12	
	Reading /	Self study			100	
Assessment Methods and Weighting	Methods		Details		Veighting in final course grade (%)	
	Assignme	nts	Coursework (ass tutorials, and a class	ignments, s test)	25	
	Examinati	on	One 3-hour written e	examination	75	
Required/recommended reading and online materials	Version, Ju	J.F., Estimating Unpaid Claims Usin ıly 2010 and Modlin, C., Basic Ratemaking, Ca		·	•	
Course Website	moodle.hk	u.hk				
Additional Course Information	Trending P American Principles, Casualty A Property an Feldblum, Insurance,	s:  standard Board of the American Acade rocedures in Property/Casualty Insurar Academy of Actuaries Committee or June 1980 Actuarial Society Committee on Rate ad Casualty Insurance Ratemaking, Ca S., Personal Automobile Premiums: A PCAS LXXXIII, 1996, pp. 190-256 (exc Services Office, Inc., Personal Automobile	nce Ratemaking n Risk Classification, making Principles, S asualty Actuarial Socie An Asset Share Pricit cluding Secions 7-9)	Risk Classificati Statement of Prin ety, May 1988 ng Approach for I	ion Statement of ciples Regarding Property-Casualty	

STAT6110 Advanced proba	Academic Year	2014		
Offering Department	Offering Department Statistics & Actuarial Science			

Course Co-ordinator	Prof Y Lar	Prof Y Lam, Statistics & Actuarial Science (lamy@hku.hk)					
Teachers Involved	Prof Y La	Prof Y Lam, Statistics & Actuarial Science					
Course Objectives	basic con	This course provides an introduction to measure theory and probability. The course will focus on some basic concepts in theoretical probability which are important for students to do research in actuarial science, probability and statistics.					
Course Contents & Topics	measurab	sigma-algebra, measurable space, measure and probability, measure space and probability space, measurable functions, random variables, integration theory, characteristic functions, convergence of random variables, Hilbert spaces, conditional expectation, martingales.					
Course Learning Outcomes	On succes	On successful completion of this course, students should be able to:					
	<ol> <li>Learn lemma an</li> <li>Unders</li> </ol>	<ol> <li>Understand the fundamental measure theory and probability theory.</li> <li>Learn the general concept of integration, understand the monotone convergence theorem, Fatou's lemma and dominated convergence theorem.</li> <li>Understand the concept of conditional expectation.</li> <li>Have some elementary knowledge of martingale.</li> </ol>					
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in S	TAT3603 Probability modelling or STA	T3903 Stochastic mod	dels			
Offer in 2014 - 2015	Y 1st	sem		Examination	Dec		
Offer in 2015 - 2016	Y						
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.						
	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. Organization and presentational skills are minimally effective or ineffective.					
Course Type	Lecture-ba	ased course					
Course Teaching	Activitie	s	Details		No. of Hours		
& Learning Activities	Lectures				36		
	Tutorials				12		
	Reading	/ Self study			100		
Assessment Methods and Weighting	Methods	•	Details		Weighting in final course grade (%)		
	Assignments		Coursework (as tutorials, and a class	signments, ss test)	50		
	Examina	tion	One 2-hour written	examination	50		
Required/recommended reading and online materials	New York	od and Philip Protter: Probability Essen , 2004, 2nd edition) L.: A Course in Probability Theory (Ac	,	0			
Course Website	moodle.hl	, , ,	,,	,			

STAT6111 Computational	STAT6111 Computational statistics (6 credits)					
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 aims to give undergraduate and postgraduate students in statistics a background in modern computationally-intensive methods in statistics. It emphasizes the role of computation as a fundamental tool of discovery in data analysis, of statistical inference, and for development of statistical theory and methods.					
Course Contents & Topics	Contents include: 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:  1. Understand the importance of the technique for generating random variables in Bayesian statistics, Monte Carlo integration and bootstrapping methods.					
	600					

	algorithm 3. Unders their rang 4. Apply generate 5. Apply I	and apply them to fit g stand the essence and le of application, and ap EM-type algorithms to posterior samples. Bootstrap methods to o	eneralized linear basic principle o oply them to solv find the posterio btain estimated s	f the EM-type algorithms and	MM-type ain Monte	algorithms, realize	
Pre-requisites (and Co-requisites and Impermissible combination)	Pass in S	Pass in STAT3600 Linear statistical analysis or STAT3907 Linear models and forecasting					
Offer in 2014 - 2015	Y 1st	t sem		Examin	ation	Dec	
Offer in 2015 - 2016	Υ						
Course Grade	A+ to F						
Grade Descriptors	A	course learning outcome	es. Show strong anal oply knowledge to a	ed level of extensive knowledge and ytical and critical abilities and logical wide range of complex, familiar and ills.	thinking, w	ith 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	outcomes. Lack of analy	tical and critical abilit	and of knowledge and skills required ties, logical and coherent thinking. Sl and presentational skills are minimally	now very litt	le or no ability to apply	
Course Type	Lecture-b	ased course					
Course Teaching	Activitie	es		Details		No. of Hours	
& Learning Activities	Lectures	<b>.</b>				36	
	Tutorials	<b>.</b>				12	
	Reading	Reading / Self study				100	
Assessment Methods and Weighting	Methods	s		Details		Weighting in final course grade (%)	
	Assignm	ents		Coursework (assignmen practical work, and a term to		50	
	Examina	ation		One 2-hour written examina	ition	50	
Required/recommended reading and online materials	iterative ( Givens, C	Computation (Chapman G.H. and Hoeting, J.A.:	i & HalÍ/CRC, Bo Computational S		Ū		
Course Website	moodle.h	ku.hk					

STAT6114 Advanced statist	Academic Year	2014					
Offering Department	Statistics & Actuarial Science	Quota					
Course Co-ordinator	Dr J F Yao, Statistics & Actuarial Science (jeffyao@hku.hk)						
Teachers Involved	Dr J F Yao, 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 and the statistical properties of the model estimation procedures. Topics from: (i) Generalized linear models; (ii) Random effects and mixed models; (iii) Nonparametric and semi-parametric methods: kernel and local polynomial regression; selection of smoothing parameters; (iv) Additive models; semi-parametric mixed models; generalized additive models; and (v) General issues of model selection: AIC, BIC and cross-validation.						
Course Learning Outcomes	On successful completion of this course, students should be able to:  1. Undersatnd the definition and basic characteristics of each statistical model.  2. Identify for a given set of data the most suitable statistical model and tools to use.  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 combination)	Pass in STAT3600 Linear statistical analysis						
Offer in 2014 - 2015	Y 2nd sem	Examination	May				

Offer in 2015 - 2016	Υ	Υ				
Course Grade	A+ to F	A+ to F				
Grade Descriptors	Α	Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.				
	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	learning outcome	s. Show evidence of so	mmand of knowledge and skills required for att ome analytical and critical abilities and logical thi ply moderately effective organizational and prese	inking, 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	Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.				
Course Type	Lecture-l	pased course				
Course Teaching & Learning Activities	Activitie	Activities		Details	No. of Hours	
& Learning Activities	Lecture	3			36	
	Tutorials	Tutorials			12	
	Reading	Reading / Self study			100	
Assessment Methods and Weighting	Method	Methods		Details	Weighting in final course grade (%)	
	Assignn	Assignments		Coursework (assignments and class test(s))	50	
	Examina	Examination		One 2-hour written examination	50	
Required/recommended reading and online materials	2. Textbo	1. Textbook : R.H. Myers et al.: Genelized Linear Models (2nd ed.), Wiley 2. Textbook : W. Hardle et al., 2004: Nonparametric and Semi-parametric Models. Springer 3. Suggested Reading : M. Panik, 2009: Regression Modeling, CRC Press				
Course Website	moodle.h	nku.hk				

titative ris	k management and finance (6 credits)	Academic Year	2014				
Statistics	& Actuarial Science	Quota					
Prof W K	Li, Statistics & Actuarial Science (hrntlwk@hku.hk)						
Prof W K	Prof W K Li, Statistics & Actuarial Science						
links finan	This course covers statistical methods and models of importance to risk management and finance and links finance theory to market practice via statistical modeling and decision making. Emphases will be put on empirical analyses to address the discrepancy between finance theory and market data.						
of options	Basic Monte Carlo and Quasi-Monte Carlo Methods; Variance Reduction Techniques; Simulating the value of options and the value-at-risk for risk management; Review of univariate volatility models; multivariate volatility models; Stochastic interest rate models; Extreme value theory for risk management.						
1. Apply N 2. Predict	On successful completion of this course, students should be able to:  1. Apply Monte Carlo methods to determine the value of options and other derivative securities.  2. Predict volatility of a set of securities using appropriate models.  3. Estimate the value-at-risk under extreme value theory.						
Pass in S	Pass in STAT4608 Market risk analysis						
N		Examination					
Υ							
A+ to F							
A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.							
B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.							
C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.							
D  Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.							
	Statistics Prof W K Prof W K This cour links finar on empiric Basic Mon of options volatility n On succe 1. Apply N 2. Predict 3. Estimat Pass in S N Y A+ to F  A B	Statistics & Actuarial Science  Prof W K Li, Statistics & Actuarial Science (hrntlwk@hku.hk)  Prof W K Li, Statistics & Actuarial Science  This course covers statistical methods and models of importance links finance theory to market practice via statistical modeling and on empirical analyses to address the discrepancy between finance. Basic Monte Carlo and Quasi-Monte Carlo Methods; Variance Redu of options and the value-at-risk for risk management; Review of uvolatility models; Stochastic interest rate models; Extreme value the On successful completion of this course, students should be able to 1. Apply Monte Carlo methods to determine the value of options and 2. Predict volatility of a set of securities using appropriate models. 3. Estimate the value-at-risk under extreme value theory.  Pass in STAT4608 Market risk analysis  N  Y  A+ to F  A Demonstrate thorough mastery at an advanced level of extensive k course learning outcomes. Show strong analytical and critical abilitit thought, and ability to apply knowledge to a wide range of complex effective organizational and presentational skills.  B Demonstrate substantial command of a broad range of knowledge the course learning outcomes. Show evidence of analytical and critical apply knowledge to familiar and some unfamiliar situations. Apply effective apply knowledge to familiar and some unfamiliar situations. Apply effective arrange of complex effective of some analytical and critical apply knowledge and learning outcomes. Show evidence of some analytical and critical apply knowledge and learning outcomes. Show evidence of some analyti	Statistics & Actuarial Science Prof W K Li, Statistics & Actuarial Science (hrntlwk@hku.hk) Prof W K Li, Statistics & Actuarial Science This course covers statistical methods and models of importance to risk management links finance theory to market practice via statistical modeling and decision making. Emp on empirical analyses to address the discrepancy between finance theory and market date Basic Monte Carlo and Quasi-Monte Carlo Methods; Variance Reduction Techniques; Sin of options and the value-at-risk for risk management; Review of univariate volatility more volatility models; Stochastic interest rate models; Extreme value theory for risk management.  On successful completion of this course, students should be able to:  1. Apply Monte Carlo methods to determine the value of options and other derivative security. Predict volatility of a set of securities using appropriate models. 3. Estimate the value-at-risk under extreme value theory.  Pass in STAT4608 Market risk analysis  N Examination  Y  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 knowledge and skills required for attain the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational of knowledge and skills required for attaining planning outcomes. Show evidence of some analytical and critical abilities and logical thinking, learning outcomes. Show evidence of some analytical and critical abilities and logical thinking.				

	Fail		al and critical abilities, logical and coherent thinking. Show ns. Organization and presentational skills are minimally effe				
Course Type	Lecture-l	Lecture-based course					
Course Teaching & Learning Activities	Activitie	es	Details	No. of Hours			
	Lectures	S		36			
	Tutorials	S		12			
	Reading / Self study			100			
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)			
	Assignn	nents	Coursework (assignments, tutorials, and a class test)	25			
	Examina	ation		75			
Required/recommended reading and online materials	McLeish, Don L.: Monte Carlo Simulation & Finance. (Wiley, 2005). Glasserman, Paul: Monte Carlo Methods in Financial Engineering. (Springer, 2003). Danielsson Jon: Financial Risk Forecasting (Willy 2011) McNeil, A. J., Frey, R. & Embrechts, P.: Quantitative Risk Management (Princeton, 2005) Tsay, R.S.: Analysis of Financial Time Series (Wiley, 2010, 3rd edition)						
Course Website	moodle.h	nku.hk					

	nous in stat	ds in statistics (6 credits)				2014		
Offering Department	Statistics	& Actuarial Science	9		Quota			
Course Co-ordinator	Dr J F Ya	o, Statistics & Actu	arial Science (jeffy	ao @hku.hk)				
Teachers Involved	Dr J F Ya	Dr J F Yao, Statistics & Actuarial Science						
Course Objectives	useful in p	This course introduces some statistical concepts and methods which potential graduate students will find useful in preparing for work on a research degree in statistics. Focus is on applications of state-of-the-art statistical techniques and their underlying theory.						
Course Contents & Topics	1. Basic a limit theor 2. Parame variants; s 3. Nonpa regression 4. Compu 5. Robust 6. Sequer 7. Model s	Contents may be selected from:  1. Basic asymptotic methods: modes of convergence; stochastic orders; laws of large numbers; central limit theorems; delta method; Edgeworth expansions; saddlepoint approximations.  2. Parametric and nonparametric likelihood methods: high-order approximations; profile likelihood and its variants; signed likelihood ratio statistics; empirical likelihood.  3. Nonparametric statistical inference: sign and rank tests; Kolmogorov-Smirnov test; nonparametric regression; density estimation; kernel methods.  4. Computationally-intensive methods: cross-validation; bootstrap; permutation methods.  5. Robust methods: measures of robustness; M-estimator; L-estimator; R-estimator; estimating functions.  6. Sequential analysis: sequential probability ratio test; sequential estimation.  7. Model selection using information criteria.  8. Other topics as determined by the instructor.						
Course Learning Outcomes	1. Compre 2. Unders 3. Apply a	On successful completion of the course, students should be able to:  1. Comprehend the language and technicalities found in statistical research literature.  2. Understand the use of standard mathematical tools for conducting statistical research.  3. Apply a variety of research tools to solve standard statistical problems.  4. Acquire exposure to some developments in contemporary statistical research.						
Pre-requisites	Doos in C	Pass in STAT3600 Linear statistical analysis or STAT3907 Linear models and forecasting						
(and Co-requisites and	Pass III S	TAT3600 Linear sta	atistical analysis or	STAT3907 Linear	models and forecastin	g		
(and Co-requisites and mpermissible combination)		TAT3600 Linear sta	atistical analysis or	STAT3907 Linear	models and forecastin	g Dec		
and Co-requisites and mpermissible combination) Offer in 2014 - 2015			atistical analysis or	STAT3907 Linear				
(and Co-requisites and Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016	Y 1st		atistical analysis or	STAT3907 Linear I				
Grade Descriptors	Y 1st	Sem  Demonstrate thorou course learning outs thought, and ability	gh mastery at an adva comes. Show strong ar	nced level of extensive l alytical and critical abilit a wide range of comple		Dec  ed for attaining all the th evidence of original		
(and Co-requisites and Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade	Y 1st Y A+ to F	Demonstrate thorou course learning out thought, and ability effective organizatio Demonstrate substathe course learning	gh mastery at an adva comes. Show strong ar to apply knowledge to nal and presentational in intial command of a bro outcomes. Show evide	nced level of extensive lalytical and critical abilit a wide range of comple ikills. and range of knowledge nce of analytical and c	Examination  knowledge and skills requirities and logical thinking, with	Dec  ed for attaining all the the evidence of original truations. Apply highly aining at least most of hinking, and ability to		
(and Co-requisites and Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade	Y 1st Y A+ to F	Demonstrate thorou course learning out thought, and ability effective organizatio Demonstrate substathe course learning apply knowledge to Demonstrate general learning outcomes.	gh mastery at an advai comes. Show strong ar to apply knowledge to nal and presentational : intial command of a bro outcomes. Show evide familiar and some unfai al but incomplete com Show evidence of som	nced level of extensive I alytical and critical abilit a wide range of comple ikills. nad range of knowledge nce of analytical and c niliar situations. Apply e nand of knowledge and e analytical and critical	Examination  knowledge and skills requirities and logical thinking, with x, familiar and unfamiliar side and skills required for attactifical abilities and logical the second se	Dec  ed for attaining all the the evidence of original ituations. Apply highly aining at least most of hinking, and ability to presentational skills.  g most of the course g, and ability to apply		
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(and Co-requisites and Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade	Y 1st Y A+ to F A B C	Demonstrate thorou course learning out thought, and ability effective organizatio Demonstrate substathe course learning apply knowledge to Demonstrate general learning outcomes. knowledge to most for Demonstrate partial outcomes. Show explow limited ability presentational skills. Demonstrate little o outcomes. Lack of a	gh mastery at an advancemes. Show strong an to apply knowledge to nal and presentational suntial command of a broutcomes. Show evide familiar and some unfal al but incomplete command of the suntial sutter of some amiliar situations. Apply but limited command or idence of some coher to apply knowledge to a poly knowledge to a providence of command or idence of command or identical and critical ab	nced level of extensive lalytical and critical abilitia wide range of comple kikills.  and range of knowledge nce of analytical and cilical and critical and critical moderately effective or f knowledge and skills rent and logical thinking of solve problems. Applement of knowledge and skills rent and logical thinking of solve problems. Applement of knowledge and cohenical thinking of solve problems.	Examination  knowledge and skills requireties and logical thinking, wit x, familiar and unfamiliar size and skills required for attaintical abilities and logical thinkin abilities and logical thinkin abilities and logical thinkin abilities and logical thinkin abilities and logical presentational and presentational a	ed for attaining all the the evidence of original truations. Apply highly aining at least most of hinking, and ability to presentational skills.  If most of the course g, and ability to apply onal skills.  If the course learning I and critical abilities, we organizational and g the course learning e or no ability to apply		
(and Co-requisites and Impermissible combination) Offer in 2014 - 2015 Offer in 2015 - 2016 Course Grade	Y 1st Y A+ to F  A  B  C  D  Fail	Demonstrate thorou course learning out thought, and ability effective organizatio Demonstrate substathe course learning apply knowledge to Demonstrate general learning outcomes. knowledge to most for Demonstrate partial outcomes. Show explow limited ability presentational skills. Demonstrate little o outcomes. Lack of a	gh mastery at an advancemes. Show strong an to apply knowledge to nal and presentational suntial command of a broutcomes. Show evide familiar and some unfal al but incomplete command of the suntial sutter of some amiliar situations. Apply but limited command or idence of some coher to apply knowledge to a poly knowledge to a providence of command or idence of command or identical and critical ab	nced level of extensive lalytical and critical abilitia wide range of comple kikills.  and range of knowledge nce of analytical and cilical and critical and critical moderately effective or f knowledge and skills rent and logical thinking of solve problems. Applement of knowledge and skills rent and logical thinking of solve problems. Applement of knowledge and cohenical thinking of solve problems.	Examination  knowledge and skills requireties and logical thinking, wit x, familiar and unfamiliar size and skills required for attaining abilities and logical thinking danizational and presentative and logical thinking ganizational and presentative equired for attaining some, but with limited analytically limited or barely effective skills required for attaining ent thinking. Show very little	ed for attaining all the the evidence of original truations. Apply highly aining at least most of hinking, and ability to presentational skills.  If most of the course g, and ability to apply onal skills.  If the course learning I and critical abilities, we organizational and g the course learning e or no ability to apply		

## Department of Statistics & Actuarial Science

& Learning Activities	Lectures		36		
	Tutorials		12		
	Reading / Self study		100		
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)		
	Assignments	Coursework (assignments, tutorials, and a class test)	25		
	Examination	One 2-hour written examination	75		
Required/recommended reading and online materials	DasGupta, A. (2008). Asymptotic Theory of Statistics and Probability. Springer:. Efron, B. and Tibshirani, R.J. (1993). An Introduction to the Bootstrap. Chapman & Hall: New York. Owen, A.B. (2001). Empirical Likelihood. Chapman & Hall: Boca Raton. Shao, J. (1999). Mathematical Statistics. Springer: New York. Wasserman, L. (2006). All of Nonparametric Statistics. Springer.				
Course Website	moodle.hku.hk				

**Degree Regulations** 

# SCIENCE

### SECTION X Degree Regulations

# REGULATIONS FOR THE DEGREE OF BACHELOR OF SCIENCE (BSc)

These regulations apply to students admitted under the 4-year '2012 curriculum' to the BSc degree curriculum in the academic year 2012-2013 and thereafter.

(See also General Regulations and Regulations for First Degree Curricula)

### **Definitions**

**Sc1**<sup>1</sup> 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 Department of Biochemistry.

"Advanced Science course" means any level 3, 4 or above course offered by the Faculty of Science and the Department of Biochemistry.

"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.

<sup>&</sup>lt;sup>1</sup> 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 0.05 Grade Point.
- (c) A list of candidates who have successfully completed all degree requirements shall be posted on Faculty noticeboards.

# REGULATIONS FOR FIRST DEGREE CURRICULA 1

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

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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.

<sup>(</sup>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.

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### **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 English<sup>2</sup> and 6 credits in an English in the Discipline course<sup>3</sup>;
- (b) successful completion of 6 credits in Chinese language enhancement<sup>4</sup>;
- (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 Inquiry<sup>5</sup> 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

<sup>&</sup>lt;sup>2</sup> 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*.

<sup>&</sup>lt;sup>3</sup> (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.

<sup>(</sup>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.

<sup>(</sup>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.

<sup>&</sup>lt;sup>4</sup> 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*.

<sup>&</sup>lt;sup>5</sup> 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;
  - (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 follows<sup>6</sup>:

Grade		Standard	Grade Point
A+	1		4.3
A	}	Excellent	4.0
A-	J		3.7
B+	)		3.3
В	}	Good	3.0
B-	J		2.7
C+	1		2.3
C	}	Satisfactory	2.0
C-	J	•	1.7
D+	ì	Dogg	1.3
D	ſ	Pass	1.0
F		Fail	0

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<sup>&</sup>lt;sup>6</sup> 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 divisions<sup>7</sup>: 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 0.05 Grade Point.
- (c) A list of candidates who have successfully completed all degree requirements shall be posted on Faculty noticeboards.

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<sup>&</sup>lt;sup>7</sup> 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 fist 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.

<sup>(</sup>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:
  - (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 English<sup>2</sup> and 6 credits in an English in the Discipline course<sup>3</sup>:
- (b) successful completion of 6 credits in Chinese language enhancement<sup>4</sup>;
- (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 Inquiry<sup>5</sup> 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:

andidates may be exem

Candidates may be exempted, with or without special conditions attached, from any of the

<sup>&</sup>lt;sup>2</sup> 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*.

<sup>&</sup>lt;sup>3</sup> (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.

<sup>(</sup>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.

<sup>(</sup>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.

<sup>&</sup>lt;sup>4</sup> 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*.

<sup>&</sup>lt;sup>5</sup> 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 follows<sup>6</sup>:

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	Dogg	1.3
D	ſ	Pass	1.0
F		Fail	0

(b) Special permission may be given by Senate for courses in individual curricula to be graded as 'Pass', 'Fail' or 'Distinction'. Such courses will not be included in the

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<sup>&</sup>lt;sup>6</sup> UG 8 is not applicable to the BDS and MBBS curricula.

### **UG 9** Honours classifications:

(a) Honours classifications shall be awarded in five divisions<sup>7</sup>: 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 0.05 Grade Point.
- (c) A list of candidates who have successfully completed all degree requirements shall be posted on Faculty noticeboards.

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<sup>&</sup>lt;sup>7</sup> UG 9 is not applicable to the BChinMed, BDS and MBBS.

**Teaching Weeks** 

# SCIENCE

Teaching Weeks 2014-2015 for Undergraduate and Taught Postgraduate Students

	SUN	<b>MON</b>	<b>TUE</b> 2	<b>WED</b> 3	THUR 4	<b>FRI</b> 5	SAT 6	П	Week	FIRST SEMESTER: SEP 1 - DEC 23, 2014 First Day of Teaching: Sep 1, 2014
SEP-14	7	8	[9]	10	11	12	13		2	That Buy of Tedening, Sep 1, 2011
SEP-14	14 21	15 22	16 23	17 24	18 25	19 26	20 27		3 4	
	28	29	30	[1]	[2]	3	4		5	
	5	6	7	8	9	10	11		6	
OCT-14	12 19	13 20	14 21	15 22	16 23	17 24	18 25		7 (Reading) 8	Reading/ Field Trip Week: Oct 13 - 18, 2014
	26	27	28	29	30	31	1		9	
	2	3	4	5	6	7	8		10	
NOV-14	9 16	10 17	11 18	12 19	13 20	14 21	15 22		11 12	
	23 30	24	25	26	27	28	29		13	Last Day of Teaching: Nov 29, 2014
		1	2	3	4	5	6		14 (Revision)	Revision Period: Dec 1 - 5, 2014
DEC-14	7 14	8 15	9 16	10 17	11 18	12 19	13 20		15 16	Assessment Period: Dec 6 - 23, 2014
22011	21	22	23	(24)	[25]	[26]	27		17	
	28	29	30	<31>	[1]	2	3		18 (Break)	
	4	5	6	7	8	9	10		19 (Break)	CECONE CENTECTER AND A MAN AS ASS
JAN-15	11 18	12 19	13 20	14 21	15 22	16 23	17 24	1	20 (Break) 21	SECOND SEMESTER: JAN 19 - MAY 30, 2015 First Day of Teaching: Jan 19, 2015
	25	26	27	28	29	30	31		22	,
FEB-15	1 8	2 9	3 10	4 11	5 12	6 13	7 14		23 24	
FEB-15	15 22	23	17	<18>	[19] 26	[20] 27	28		25	Class Suspension Period for the Lunar New Year: Feb 19 - 25, 2015
	1	2	3	4	5	6	7		27	
MAR-15	8 15	9 (16)	10 17	11 18	12 19	13 20	14 21		28 (Reading) 29	Reading/ Field Trip Week: Mar 9 - 14, 2015
	22	23	24	25	26	27	28		30	
	29	30	31	1	2	[3]	[4]		31	
APR-15	5 12	[6] 13	[7] 14	8 15	9 16	10 17	11 18		32 33	
AI K-13	19	20	21	22	23	24	25		34	
	26	27	28	29	30	[1]	2	H	35	Last Day of Teaching: May 2, 2015
	3	4	5	6	7	8	9		36 (Revision)	Revision Period: May 4 - 9, 2015
MAY-15	10 17	11 18	12 19	13 20	14 21	15 22	16 23		37 38	Assessment Period: May 11 - 30, 2015
	24	[25]	26	27	28	29	30		39	
	31	1	2	3	4	5	6		40 (Break)	
JUN-15	7 14	8 15	9 16	10 17	11 18	12 19	13 [20]		41 (Break) 42 (Break)	
3011-13	21	22	23	24	25	26	27		43 (Break)	OPTIONAL SUMMER SEMESTER
	28	29	30	[1]	2	3	4		44	Jun 29 - Aug 22, 2015
	5	6	7	8	9	10	11		45	
JUL-15	12 19	13 20	14 21	15 22	16 23	17 24	18 25		46 47	
	26	27	28	29	30	31			48	
	2	3	4	5	6	7	1 8		49	
AUG-15	9	10	11	12	13	14	15 22		50 51	
	16 23	17 24	18 25	19 26	20	21	22 29		52 (Break)	
	30	31							53 (Break)	
[] General	l Holiday				Reading/ I	Field Trip	Week			
() Univers	sity Holida	ıy (Full Day	·)		Revision I	Period				
<> Univer	rsity Holid	lay (afterno	on only)		Class Susp	ension Pe	eriod for the	Luna	ar New Year	
	-	-	•		Assessmer					
					1					

Useful contacts and websites

# SCIENCE

## Useful contacts and websites

Faculty of Science Office Location : Ground Floor,

Chong Yuet Ming Physics Building

Tel : 3917 2683
Fax : 2858 4620
Email : science@hku.hk

Website : http://www.scifac.hku.hk/

(Please visit <a href="http://www.scifac.hku.hk/">http://www.scifac.hku.hk/</a> for the latest updates of BSc courses, timetables, notices and forms)

**Departments/School** 

Biochemistry Website : http://www.biochem.hku.hk/
Biological Sciences Website : http://www.biosch.hku.hk/

Chemistry Website : http://chem.hku.hk/

Earth Sciences Website : http://www.earthsciences.hku.hk/

MathematicsWebsite: http://www.math.hku.hk/PhysicsWebsite: http://www.physics.hku.hk/Statistics & Actuarial ScienceWebsite: http://www.saasweb.hku.hk/

Academic Advising Office Tel : 2219 4686

Website : http://aao.hku.hk

Academic Services Office Office Location : G4, Run Run Shaw Building

Tel : 2859 2433
Fax : 2540 1405
Email : asoffice@hku.hk

Website : http://www.asa.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