3

## BSc

### Syllabuses and Regulations (3-year curriculum)

2012-13

### **Faculty of Science**

The University of Hong Kong

## **General Information**

### **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.

### BSc Degree regulations

Rules that cover curriculum requirements, selection of courses, assessment, unsatisfactory progress, advanced credits and degree 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 credits and exemption, etc, can be found in the *Handbook for BSc Students*, which is available on-line at http://www.scifac.hku.hk/ug/current

Updates on BSc Syllabuses and Regulations can be found at http://webapp.science.hku.hk/sr3/servlet/enquiry

SECTION I	BSc Degree Curriculum and Graduation Requirements	3 - 5
SECTION II	List of BSc Courses on offer in 2012-13 and 2013-14	6 - 26
SECTION III	List of Courses for Faculty Electives: Blocks A, B and C	27 - 30
SECTION IV	Experiential Learning for Science Students	31 - 36
SECTION V	Science Majors on offer in 2012-13 37	7 - 162
List of Science	ce Majors	. 37
Major i	n Astronomy	38
Major i	n Biochemistry	46
Major i	n Biology	54
Major i	n Biotechnology	62
Major i	n Chemistry	70
Major i	n Earth Sciences	78
Major i	n Ecology & Biodiversity	86
Major i	n Environmental Science	94
Major i	n Food & Nutritional Science	106
Major i	n Mathematics	115
Major i	n Mathematics / Physics	. 123
Major i	n Microbiology	. 131
Major i	n Physics	139
	n Risk Management	
Major i	n Statistics	. 155

163 - 235

### SECTION VI Science Minors on offer in 2012-13

163
164
168
172
176
183
187
191
195
199
203
207
211
215
220
224
228

### SECTION VII Replacement Courses for the same disciplinary courses appear in two or more Science Majors or Minors

#### SECTION VIII Course Descriptions of BSc, Language, Common Core Courses 237 - 501 **Biochemistry** 237 ..... **Biological Sciences** 247 English Chemistry Chinese ..... 337 **Earth Sciences** ..... 339

Mathematics	362
Physics	393
Science Faculty	423
Statistics & Actuarial Science	425
Common Core Courses offered by Science Faculty	473

### SECTION IX Degree Regulations

Regulations for First Degree Curricula	502
Regulations for the Degree of Bachelor of Science	514

502 - 522

236

## **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 in 2007 or thereafter are required to complete at least one Science major as your primary major for the award of the BSc degree. In addition to the primary Science major, students may take a second major or a minor in a Science or non-Science discipline. Students should note that some non-Science majors and minors may require students to have achieved a minimum academic result before they are allowed to enroll in them.

### 2. BSc Graduation Requirements and Honours Classification

## (I) Award of a BSc degree (for students admitted to the first year in 2010-11, 2011-12 and 2012-13 and admitted directly to the second year in 2011-12 and 2012-13 (under 3-year curriculum))

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

- (a) Satisfied the requirements in UG5 of the Regulations for First Degree Curricula<sup>#</sup>;
- (b) Passed not fewer than 180 credits, comprising
  - i. At least 90 credits of Science courses, of which no less than 60 credits must be gained from advanced Science courses; and
  - ii. All required courses as prescribed in the major programme of the BSc degree curriculum; and the Faculty elective courses.
- <sup>#</sup> UG5 specifies that students have to successfully complete (1) 6 credits in English language enhancement, i.e. CAES1801 Academic English for Science Students and CAES2802 Advanced English for Science Students; (2) 3 credits in Chinese language enhancement, i.e. CSCI0001 Practical Chinese language course for science students; (3) 12 credits of courses in the Common Core Curriculum, selecting no more than one course from each Area of Inquiry.

### (II) Award of a BSc degree (for students admitted in 2009-10 or before and admitted directly to the second year in 2010-11)

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

- (a) Take 180 credits of courses
- (b) Pass 180 credits<sup>\*\*</sup> of courses of which at least 90 credits must be gained from Science courses, of which no less than 60 credits must be gained from advanced Science courses
- (c) Pass
  - i. ECEN1801/CAES1801 Academic English for Science Students
  - ii. ECEN2802/CAES2802 Advanced English for Science Students
  - iii. CSCI0001 Practical Chinese Language Course for Science Students
  - iv. a 3-credit broadening course in "Humanities and Social Sciences Studies" \*<sup>Λ<sup>Ω</sup></sup>
     v. IT proficiency requirement : YITC1002 Information Technology Proficiency
  - Test<sup>@Q</sup>
  - vi. all required courses as prescribed in the major and minor curriculum; and the Faculty Electives  ${}^{\#}$

- \*\* Students are also required to pass a 3-credit broadening course in Culture and Value Studies <sup>Ω</sup> or a 3-credit course in an area outside the BSc curriculum. This requirement will be waived if students have successfully completed a second major or minor in a nonscience discipline.
- \* This requirement will be waived if students have successfully completed a second major or a minor in a non-Science discipline.
- Students admitted to the first year in 2009 may take a 6-credit IT-integrated course in Humanities and Social Sciences Studies offered in 2009-2010 or a 6-credit course in the Common Core Curriculum to be offered from 2010-2011 onwards to satisfy this requirement.
- <sup>®</sup> IT proficiency requirement can be satisfied by taking Information technology proficiency test or a 6-credit IT-integrated course in Humanities and Social Sciences Studies.
- # Faculty Electives refer to a pass of at least 6 credits from each of the Blocks A, B and C. This requirement is only for students admitted to the first year of the BSc programme in 2007 or thereafter.
- <sup>Ω</sup> For students admitted directly to the second year in 2010-11, (a) they are required to take and pass 12 credits of courses in the Common Core Curriculum, selecting no more than one course from each Area of Inquiry, to fulfill the broadening course ("Humanities and Social Sciences Studies" & "Culture and Value Studies") requirements; and (b) they have been granted a waiver of the IT <u>proficiency</u> requirement.

For students admitted in 2009-10 (or before), should they not be able to satisfactorily complete the outstanding IT Proficiency Test or broadening courses within 2010-11, Senate has approved that students be required to take Common Core courses in 2011-12 to satisfy outstanding UG3 graduation requirements. They will therefore be required to take an equivalent number of credits in any Area of Inquiry of the Common Core Curriculum to make up for the outstanding credits. Should the IT Proficiency Test or 3 credits for a broadening course be outstanding, this means they will have to overload by 3 credits and take one 6-credit Common Core course to satisfy the requirement.

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### 3. Honours Classification

### (I) Honours Classification (for students admitted to the first year in 2012-13 or thereafter)

Classification of honours are calculated using the cumulative grade point average (CGPA), with all courses taken (including failed courses, but not including courses approved by the Senate graded as "Pass", "Fail", or "Distinction") carrying equal weighting:

	COFA Range
First Class Honours	$\geq$ 3.60 - 4.30
Second Class Honours Division I	$\geq$ 3.00 – 3.59
Second Class Honours Division II	$\geq$ 2.40 – 2.99
Third Class Honours	$\geq$ 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.

### (II) Honours Classification (for students admitted to the first year in 2010-11, 2011-12 and admitted directly to the second year in 2011-12)

Classification of honours are calculated using the grade point average (GPA) of the best 180 credits taken, including 90 credits of science courses of which 60 credits must be advanced level science courses:

	<u>GPA</u>
First Class Honours	≥ 3.6
Second Class Honours Division I	≥ 2.8
Second Class Honours Division II	≥ 2.1
Third Class Honours	≥ 1.7
Pass	fulfil graduation requirements

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.

### (III) Honours Classification (for students admitted to the first year in 2007-08, 2008-09 and 2009-10 and admitted directly to the second year in 2008-09, 2009-10 and 2010-11)

Classification of honours are calculated using the grade point average (GPA) of the best 180 credits taken, including 90 credits of science courses of which 60 credits must be advanced level science courses:

	<u>GPA</u>
First Class Honours	≥ 3.5
Second Class Honours Division I	≥ 2.8
Second Class Honours Division II	≥ 2.1
Third Class Honours	≥ 1.7
Pass	fulfil graduation requirements

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.

### Science Course

A Science course is defined as any course offered by the Faculty of Science and the Department of Biochemistry. Specifically, the following courses are classified as Science courses:

Science courses							
Courses	Course code with a prefix						
Biochemistry	BIOC						
Biological Sciences	BIOL						
Chemistry	CHEM						
Earth Sciences	EASC						
Mathematics	MATH						
Physics	PHYS						
Statistics and Actuarial Science	STAT						
Science Faculty	ENVS or SCNC						

### **Advanced Science Course**

An advanced Science course means any level 2, 3 and above course offered by the Faculty of Science and the Department of Biochemistry. Specifically, the following courses are classified as advanced Science courses:

Advanced Science courses							
Courses Course code with a prefix							
Biochemistry	BIOC2 or BIOC3						
Biological Sciences	BIOL2 or BIOL3						
Chemistry	CHEM2 or CHEM3						
Earth Sciences	EASC2 or EASC3						
Mathematics	MATH2 or MATH3 or MATH6						
Physics	PHYS2 or PHYS3 or PHYS6						
Statistics and Actuarial Science	STAT2 or STAT3 or STAT6						
Science Faculty	ENVS2 or ENVS3 or SCNC2 or SCNC3						

## List of BSc Courses on offer in 2012/13 and 2013/14

### List of BSc Courses

### SECTION II List of BSc Courses on offer in 2012/13 and 2013/14<sup>^</sup>

Course Code	Title	Credit	Pre-requisite	Availa	able in	Semester offered in 2012-2013	Exam held in 2012-2013	Quota	Course Coordinator
				2012- 2013		0=year long 1=1st sem * 2=2nd sem S=summer			
Department BIOC1001	t of Biochemistry Basic biochemistry	6	(E or above in AL Biol or AL/AS	Y	Y	1	Dec	300	Prof D K Y Shum,
	basic biocircinida y	0	Chem; or Pass in CHEM0004 or CHEM0008); and Not for students who have passed in BIOL1125, or have already enrolled in this course.					000	Biochemistry
BIOC1003	Introduction to molecular genetics	6	E or above in AL Biol/AL Chem or AS Chem; or Pass in CHEM0004 or CHEM0008	Y	Y	2	Мау	150	Dr J D Huang, Biochemistry
BIOC2601	Metabolism	6	Pass in BIOC1001 or BIOL1125	Y	Y	1	Dec	60	Dr N S Wong, Biochemistry
BIOC2602	Understanding metabolic diseases	6	(Pass in BIOC1001 or BIOL1125 or BIOL1514); and (Pass in BIOC2601, or already enrolled in this course).	Y	Y	2	Мау	40	Dr L Y L Cheng, Biochemistry
BIOC2603	Principles of molecular genetics	6	Pass in BIOC1001 or BIOC1003 or BIOL1102 or BIOL1122 or BIOL1125 or BIOL1106	Y	Y	1	Dec	60	Dr M H Sham, Biochemistry
BIOC2604	Essential techniques in biochemistry and molecular biology	6	Pass in BIOC1001 or BIOC1003 or BIOL1102 or BIOL1122 or BIOL1125 or BIOL1126 or MEDE0001	Y	Y	2	Мау	60	Dr K M Yao, Biochemistry
BIOC2616	Directed studies in biochemistry	6	This course is for Biochemistry major students only; and Not for students who have passed in BIOC3614, or have already enrolled in this course.	Y	Y	1, 2, S	No exam	45	Dr J D Huang, Biochemistry
BIOC3608	Sequence bioinformatics	6	Pass in BIOC2603 or BIOL2303 or BIOL3308 or MEDE0001	Y	Y	2	May	60	Dr B C W Wong, Biochemistry
BIOC3609	Molecular medicine	6	Pass in BIOC2603 or BIOL2303	Y	Y	2	Мау	50	Dr D Y Jin,
BIOC3610	Advanced biochemistry I	6	Pass in (BIOC1001 and BIOL2301	Y	Y	1	Dec	50	Biochemistry Dr K M Yao,
BIOC3611	Advanced biochemistry II	6	and (BIOC2601 or BIOL2115)) Pass in BIOC2601 and BIOL2301; and Pass in BIOC3610, or already enrolled in this course.	Y	Y	2	Мау	50	Biochemistry Dr D Chan, Biochemistry
BIOC3613	Molecular biology of the gene	6	Pass in BIOC2603 or BIOL2303 or BIOL3308	Y	Y	2	Мау	50	Prof K S E Cheah, Biochemistry
BIOC3614	Biochemistry project	12	Pass in BIOC1001 and BIOC2604; and Pass in BIOC3610, or already enrolled in this course; and Pass in BIOC3611, or already enrolled in this course; and Pass in BIOC3615, or already enrolled in this course; and Not for students who have passed in BIOC2616, or have already enrolled in this course.	Y	Y	0	No exam	15	Dr N S Wong, Biochemistry
BIOC3615	Advanced techniques in biochemistry & molecular biology	6	Pass in (BIOC1001 and (BIOC0002 or BIOC1003) and BIOC2604)	Y	Y	1	Dec	50	Dr D Chan, Biochemistry
BIOC3988	Biochemistry internship	6	Students are expected to have satisfactorily completed the first two years study.	Y	Y	1, 2, S	No exam	10	Dr J D Huang, Biochemistry
	Biological Sciences	-	· · ·						
BIOL0118	Bioethics	6	NIL	N	Y			40	Prof F C Leung, Biological Sciences
BIOL0126	Fundamentals of biology	6	E or above in HKCEE Biol; and Not for students with E or above in AL Biol; and Not for students who have passed in BIOL1122, or have already enrolled in this course; and Not for students who have passed in any BIOL2XXX level, or have already enrolled in these courses; and Not for students who have passed in any BIOL3XXX level, or have	Y	Y	1	Dec	189	Dr W Y Lui, Biological Sciences

^ Availability of courses in 2013-2014 is subject to change.

Course Code	Title	Credit	Pre-requisite	Availa	ıble in	Semester offered in 2012-2013	Exam held in 2012-2013	Quota	Course Coordinator
						0=year long 1=1st sem * 2=2nd sem S=summer	-		
	iological Sciences (Cont'd)								
BIOL0127	Contemporary nutrition: insights and controversies	3	Not for students who have passed in BIOL1514, or have already enrolled in this course; and Not for students who have passed in BIOL2533, or have already enrolled in this course; and Not for students in Food & Nutritional Science Programme / Major / Minor.	N	N			50	Dr E T S Li, Biological Sciences
BIOL0135	Introductory microbiology	6	Not for students who have already passed in BIOL0129 before.	Y	Y	1	Dec	80	Dr V Dvornyk, Biological Sciences
BIOL0604	Evolutionary diversity	6	NIL	Y	Y	2	May	60	Prof R M K Saunders, Biological Sciences
BIOL0625	Ecology and evolution	6	NIL	Y	Y	1	Dec	50	Prof D Dudgeon, Biological Sciences
BIOL1120	The gene	6	Not for students with E or above in AL Biol; and Not for students who have already passed in BIOL0120 or YSCN0004 or CCST9011 before.	N	Y			50	Prof F C Leung, Biological Sciences
BIOL1122	Functional biology	6	E or above in AL Biol; or Pass in BIOL0126, or already enrolled in this course.	Y	N	1, 2	Dec, May	100	Prof W W M Lee, Biological Sciences
BIOL1125	Introduction to biochemistry	6	(E or above in AL Biol or AL Chem or AS Chem; or Pass in BIOL0126 or CHEM0004 or CHEM0008); and Not for Students who have passed in BIOC1001, or have already enrolled in this course.	Y	Y	1	Dec	100	Dr C S C Lo, Biological Sciences
BIOL1133	Biological sciences laboratory course	6	(E or above AL Biol; or Pass in BIOL0126); and Not for students who have already passed in BIOL0128 before; and Not for students who have already passed in BIOL0132 before.	Y	Y	2	No exam	110	Dr W Y Lui, Biological Sciences
BIOL1514	Nutrition and metabolism	6	E or above in AL Biol; or Pass in BIOL0126	Y	N	2	May	150	Dr E T S Li, Biological Sciences
BIOL1528	Food chemistry	6	(E or above in AL or AS Chem; or Pass in CHEM0004 or CHEM0008); and Not for students who have already passed in BIOL1123 before; and Not for students who have already passed in BIOL1513 before.	Y	Y	2	Мау	110	Dr J C Y Lee, Biological Sciences
BIOL1608	Biostatistics	6	Pass in BIOL0625	Y	Y	1	Dec	60	Dr K M Y Leung, Biological Sciences
BIOL2109	Economic botany	6	Pass in BIOL0126 or BIOL0604 or BIOL1122 or BIOL1528	N	Y			30	Dr C S C Lo, Biological Sciences
BIOL2111	Molecular microbiology	6	Pass in BIOL0126 or BIOL0129 or BIOL1122	Y	Y	2	Мау	50	Dr J S H Tsang, Biological Sciences
BIOL2112	Plant physiology	6	Pass in BIOL1121 or BIOL1122 or BIOL0126	Y	Y	1	Dec	100	Dr W K Yip, Biological Sciences
BIOL2115	Cell biology & cell technology	6	Pass in BIOL1121 or BIOL1122 or BIOL0126 or BIOC1001 or BIOL1125	Y	Y	1	Dec	120	Dr A S T Wong, Biological Sciences
BIOL2118	Conservation genetics	6	Pass in BIOL0604 or BIOL1106 or BIOL1122	N	Y			50	Dr M Sun, Biological Sciences
BIOL2119	Genetics	6	Pass in BIOL1121 or BIOL1122 or BIOL1125 or BIOL0126; and Not for students who have already passed in BIOL2116 or BIOL2117 before.	Y	Y	1	Dec	100	Dr C S C Lo, Biological Sciences
BIOL2203	Reproduction & reproductive biotechnology	6	E or above in AL Biol; or Pass in BIOL0126 or BIOL1107	Y	Y	1	Dec	50	Prof A O L Wong, Biological Sciences
BIOL2205	Immunology	6	Pass in BIOC1001 or BIOL1125 or BIOL1121 or BIOL1122 or BIOL0126	Y	Y	2	May	100	Dr B L Lim, Biological Sciences
BIOL2207	Endocrinology: human physiology II	6	Pass in BIOC1001 or BIOL1125 or BIOL1121 or BIOL1122 or BIOL0126	N	Y			90	Prof B K C Chow, Biological Sciences
BIOL2210	Evolution	6	Pass in BIOL0126 or BIOL0604 or BIOL0625 or BIOL1122 or BIOL1106	Y	Y	1	Dec	50	Dr M Sun, Biological Sciences

Course Code	Title	Credit	Pre-requisite		able in	offered in 2012-2013	Exam held in 2012-2013	Quota	Course Coordinator
						0=year long 1=1st sem * 2=2nd sem S=summer			
School of B	iological Sciences (Cont'd)					3=summer			
BIOL2215	Animal Physiology & Environmental Adaptation	6	Pass in BIOC1001 or BIOL1125 or BIOL1121 or BIOL1122 or BIOL0126	Y	Y	2	May	50	Prof A O L Wong, Biological Sciences
BIOL2218	Human physiology	6	Pass in BIOL1122 or BIOL0126	Y	Y	1	Dec	120	Dr W Y Lui, Biological Sciences
BIOL2301	Protein structure and function	6	Pass in BIOC1001 or BIOL1125 or BIOL1122 or BIOL0126	Y	Y	2	May	150	Dr W K Yip, Biological Sciences
BIOL2302	Fermentation technology	6	Pass in BIOL1122 or BIOL0126 or BIOL1123 or BIOL1528 or BIOL0129 or BIOL0135	N	N			60	TBC, Biological Sciences
BIOL2303	Molecular biology	6	Pass in BIOL1121 or BIOL1122 or BIOL0126 or BIOL0129 or BIOL0135 or BIOL1125	Y	Y	1, 2	Dec, May	80	Prof B K C Chow, Biological Sciences
BIOL2318	Biological sciences field course	6	Students are expected to have successfully completed their first year. The pre-requisites will vary according to the specific course.	Y	Y	S	No exam	20	Dr L Karczmarksi, Biological Sciences
BIOL2320	Directed studies in biological sciences	6	Pass in at least 18 credits of any BIOLXXXX courses; and	Y	Y	0	No exam	50	Dr M Sun, Biological Sciences
BIOL2324	Microbial physiology and biochemistry	6	Cumulative GPA of 2.7 or above Pass in BIOL0129 or BIOL0135 or BIOL0120 or BIOL1120; and Pass in BIOL2111 or BIOL2303, or already enrolled in either course.	Y	Y	1	Dec	60	Dr A X Yan, Biological Sciences
BIOL2503	Grain production & utilization	6	Pass in BIOL0002 or BIOL1122 or BIOL1528	Y	Y	1	Dec	40	Dr H Corke, Biological Sciences
BIOL2507	Meat and dairy science	6	Pass in BIOL0002 or BIOL1122 or BIOL0126 or BIOL1123 or	Y	Y	2	Мау	50	Prof N P Shah, Biological Sciences
BIOL2515	Food microbiology	6	BIOL1528 Pass in BIOL0002 or BIOL1123 or BIOL1528 or BIOL0129 or BIOL0135	Y	Y	2	Мау	75	Dr H S El-Nezami, Biological Sciences
BIOL2530	Molecular biology and nutrigenomics	6	Pass in BIOC1001 or BIOL1125 or BIOL1106	Y	Y	1	Dec	80	Dr K C Tan-Un, Biological Sciences
BIOL2532	Diet and disease	6	Pass in BIOL1514	Y	Y	2	Мау	75	Dr J M F Wan, Biological Sciences
BIOL2533	Nutrition and life cycle	6	Pass in BIOL1514	Y	Y	1	Dec	80	Dr E T S Li, Biological Sciences
BIOL2534	Nutrition and public health	6	Pass in BIOL1514	Y	Y	2	May	110	Dr J M F Wan, Biological Sciences
BIOL2535	Food processing and engineering laboratory course	6	Pass in BIOL0002 or (BIOL1123 and BIOL1513) or BIOL1528	Y	Y	1	Dec	70	Dr J C Y Lee, Biological Sciences
BIOL2536	Food and nutrients analysis laboratory course	6	Pass in BIOC1001 or BIOL1125 or BIOL0128 or BIOL1122 or BIOL0126 or (BIOL1123 and BIOL1513) or BIOL1528	Y	Y	1	Dec	70	Dr M F Wang, Biological Sciences
BIOL2538	Nutraceuticals and functional foods	6	Pass in BIOL1514 and BIOL1528	Y	Y	1	Dec	40	Dr M F Wang, Biological Sciences
BIOL2540	Food and Nutritional Toxicology	6	Pass in BIOL1528 or BIOL1123	Y	Y	2	Мау	90	Dr H S El-Nezami, Biological Sciences
BIOL2606	Environmental microbiology	6	Pass in BIOL0129 or BIOL0135 or ENVS1002 or BIOL0126	N	Y			80	Dr J D Gu, Biological Sciences
BIOL2607	Fish biology	6	Pass in BIOL1121 or BIOL0603 or BIOL0625 or BIOL0604 or BIOL0600	Y	Y	2	May	50	Prof Y J Sadovy, Biological Sciences
BIOL2610	Marine biology	6	Pass in BIOL0603 or BIOL0625 or BIOL0604 or BIOL0605 or BIOL0600 or EASC0105 or ENVS1002	Y	Y	2	Мау	40	Dr M Yasuhara, Biological Sciences
BIOL2611	Systematics & phylogenetics	6	Pass in BIOL1121 or BIOL0604	Y	Y	1	Dec	40	Prof R M K Saunders, Biological Sciences
BIOL2612	Conservation ecology	6	Pass in BIOL1106 or BIOL1121 or BIOL0604 or ENVS1002 or BIOL0126	Y	Y	2	Мау	40	Prof Y J Sadovy, Biological Sciences
BIOL2614	Environmental toxicology	6	Pass in BIOL2606 or CHEM1007 or CHEM1009 or CHEM2102 or EASC0118 or EASC1122	Y	Y	1	Dec	80	Dr J D Gu, Biological Sciences
BIOL2615	Freshwater ecology	6	Pass in (BIOL0601 or BIOL0600 or BIOL0625) and BIOL0604	Y	Y	1	Dec	40	Prof D Dudgeon, Biological Sciences
BIOL2617	Experimental intertidal ecology	6	Pass in BIOL0126 or BIOL0603 or BIOL0604 or BIOL0625 or BIOL1608 or BIOL2608 or ENVS1002	Y	Y	2	Мау	40	Prof G A Williams, Biological Sciences

### List of BSc Courses

Course Code	Title	Credit	Pre-requisite		able in	Semester offered in 2012-2013	Exam held in 2012-2013	Quota	Course Coordinator
				2012- 2013		0=year long 1=1st sem * 2=2nd sem S=summer			
School of B	iological Sciences (Cont'd)								
BIOL2619	Terrestrial ecology	6	Pass in BIOL0604 or BIOL0605 or BIOL0625 or BIOL0600 or BIOL0603 or ENVS1002	N	Y			30	TBC, Biological Sciences
BIOL2621	Plant structure & evolution	6	Pass in BIOL0604; and Not for students who have already passed in BIOL2616 before.	Y	Y	2	May	60	Prof R M K Saunders, Biological Sciences
BIOL2622	The biology of marine mammals	6	Pass in BIOL0604 or BIOL0605 or BIOL0600	Y	Y	1	Dec	30	Dr L Karczmarski, Biological Sciences
BIOL2625	Animal behaviour	6	Pass in BIOL0604 or BIOL0625	Y	Y	1	Dec	30	Dr L Karczmarski, Biological Sciences
BIOL3214	General virology	6	Pass in BIOL2303 or BIOL2205 or BIOC2603 or BIOC1003	Y	Y	1	Dec	40	Dr B L Lim, Biological Sciences
BIOL3219	Clinical microbiology and applied immunology	6	Pass in BIOL2205	Y	Y	2	Мау	80	Dr W Y Lui, Biological Sciences
BIOL3307	Biotechnology industry	6	Pass in BIOL2303 or BIOC2603	N	N			40	TBC, Biological Sciences
BIOL3315	Animal biotechnology	6	Pass in BIOC2603 or BIOL2303	Y	Y	2	Мау	80	Dr A S T Wong, Biological Sciences
BIOL3316	Plant biotechnology	6	Pass in BIOC2603 or BIOL2303	Y	Y	1	Dec	80	Prof M L Chye, Biological Sciences
BIOL3317	Microbial biotechnology	6	Pass in BIOC2603 or BIOL2303	Y	Y	2	May	60	Dr J S H Tsang, Biological Sciences
BIOL3321	Biological sciences project	12	Pass in at least 18 credits of BIOL0XXX or BIOL1XXX level courses and 18 credits of BIOL2XXX or BIOL3XXX level courses; and Cumulative GPA of 3.0 or above	Y	Y	0	No exam	30	Prof G A Williams, Biological Sciences
BIOL3325	Molecular phylogenetics and evolution	6	Pass in BIOL2303 or BIOL2116 or BIOL2119 or BIOL2611	N	Y			25	Dr V Dvornyk, Biological Sciences
BIOL3527	Food safety and quality management	6	Pass in BIOL2515	Y	Y	1	Dec	40	Dr H Corke, Biological Sciences
BIOL3538	Food product development	6	Pass in BIOL2501 or BIOL2535	Y	Y	1	Dec	40	Dr M F Wang, Biological Sciences
BIOL3540	Diet, brain function and behaviour	6	Pass in BIOL1514 and BIOL2533	N	N			40	Dr E T S Li, Biological Sciences
BIOL3621	Fisheries and mariculture	6	Pass in BIOL2607 or ENVS1002 or BIOL0126	Y	Y	2	Мау	50	Prof Y J Sadovy, Biological Sciences
BIOL3622	Ecological impact assessment	6	Pass in BIOL0605 or BIOL0600 or ENVS1002	Y	Y	2	May	30	Prof R S S Wu, Biological Sciences
BIOL3626	Conservation in practice	6	BIOL2612 Conservation ecology	N	Y			30	Professor Y Sadovy, Biological Sciences
BIOL3988	Biological sciences internship	6	Students are expected to have satisfactorily completed their Year 2 study.	Y	Y	1, 2, S	No exam		Dr T Vengatesen, Biological Sciences
ENVS1002	Environmental life science	6	Nil	Y	Y	1	Dec	40	Dr T Vengatesen, Biological Sciences
ENVS2003	Demographic principles in ecology and evolution	6	Pass in ENVS0001 or BIOL0126 or ENVS1002 or BIOL0625 or BIOL0604 or STAT1301 or MATH1111 or BIOL0605 or ECON1001	Y	Y	1	Dec	60	Dr D L Thomson, Biological Sciences
ENVS2009	Remediation	6	Pass in ENVS0001; and Pass in BIOL2606 or ENVS2008, or already enrolled in either course.	N	Y			50	Dr J D Gu, Biological Sciences
ENVS2012	Global change ecology	6	Pass in ENVS1002	Y	Y	2	May	50	Dr C Dingle, Biological Sciences
ENVS3013	Ecological demography in changing environments	6	Pass in BIOL1608, BIOL2608 or BIOL2610 or BIOL2611 or BIOL2612 or BIOL2615 or BIOL2617 or BIOL2619 or ENVS2003 or STAT2301 or STAT2801 or ECON2101	N	Y			60	Dr D L Thomson, Biological Sciences
ENVS3014	Environmental risk assessment and management	6	Pass in BIOL1608 or BIOL2608 or BIOL2614 or CHEM2102 or ENVS2008 or ENVS2009	N	Y				Dr K M Y Leung, Biological Sciences
ENVS3016	Environmental science in practice	6	Satisfactorily completed second year of study in the Environmental Science major	Y	Y	0	No exam	18	Dr M Yasuhara, Biological Sciences
ENVS3988	Environmental science internship	6	Students are expected to have satisfactorily completed their Year 2 study.	Y	Y	1, 2, S	No exam	30	Dr C Dingle, Biological Sciences

Course Code	Title	Credit	Pre-requisite	Availa	able in	Semester offered in 2012-2013	Exam held in 2012-2013	Quota	Course Coordinator
				2012- 2013		0=year long 1=1st sem * 2=2nd sem S=summer			
	Applied English Studies	3	Not for students who have passed	Y	Y	1	Dec		Mr P D Desloge,
CALGIOUT	Science Students	5	in ECEN1801 before.			1	Dec		English
CAES2802	Advanced English for	3	Pass in ECEN1801/CAES1801	Y	Y	2	May		Mr P D Desloge,
Donortmont	Science Students								English
	Chemistry and daily life	3	Not for students who have passed in CHEM1002, or have already enrolled in this course; and Not for students who have passed in CHEM1003, or have already enrolled in this course; and Not for students who have already passed in CHEM1005 before; and Not for students who have already	N	N			200	Prof W K Chan, Chemistry
			Not for students who have already passed in CHEM1007 before; and Not for students who have passed in CHEM1009, or have already enrolled in this course; and Not for students who have passed in CHEM1401, or have already enrolled in this course; and Not for Chemistry major students.						
CHEM0008	Fundamental chemistry	6	E or above in HKCEE Chem; and Not for students with E or above in AL Chem or AS Chem.	N	N				Dr A P L Tong, Chemistry
CHEM1002	Chemistry: principles and concepts	6	(E or above in AL or AS Chem; or Pass in CHEM0008); and Not for students who have already passed in CHEM1007 before; and Not for students who have passed in CHEM1009, or have already enrolled in this course.	Y	N	1	Dec	200	Prof D L Phillips, Chemistry
CHEM1003	Chemistry: the molecular world	6	(E or above in AL or AS Chem; or Pass in CHEM0008); and Not for students who have already passed in CHEM1406 before; and Not for students who have passed in CHEM1401, or have already enrolled in this course.	Y	N	1, 2	Dec, May	230	Prof V W W Yam, Chemistry
	Chemistry: an experimental science I	6	E or above in AL or AS Chem; or Pass in CHEM0008.	Y	N	1, 2	No exam	100	Dr A P L Tong, Chemistry
CHEM1009	Basic chemistry	6	E or above in AL or AS Chem; and Not for students who have already passed in CHEM1001 before; and Not for students who have already passed in CHEM1007 before; and Not for students who have passed in CHEM1002, or have already enrolled in this course.	Y	Y	1, 2	Dec, May	240	Dr I K Chu, Chemistry
CHEM1401	Fundamentals of organic chemistry	6	(E or above in AL or AS Chem; or Pass in CHEM0004 or CHEM0008); and Not for students who have passed CHEM1003, or have enrolled in this course.	Y	Y	1	Dec	120	Dr P H Toy, Chemistry
CHEM1410	Basic chemistry principles for pharmacy students	6	For BPharm students only; and E or above in AL or AS Chem; and Not for students who have passed in CHEM1009, or have already enrolled in this course.	Y	Y	2	Мау	30	Dr E L M Wong, Chemistry
CHEM1411	Fundamentals of Organic Chemistry for Pharmacy Students	6	For BPharm students only; and E or above in AL/AS Chemistry; and Not for students who have passed in CHEM1401, or have already enrolled in this course.	Y	Y	1	Dec	30	Dr P H Toy, Chemistry
	Introductory instrumental chemical analysis	6	Pass in CHEM1002 or CHEM1007 or CHEM1009; and Not for students who have passed CHEM2202, or have already enrolled in this course.	Y	Y	2	Мау	100	Dr W T Chan, Chemistry
CHEM2102	Environmental chemistry	6	Pass in CHEM1002 or CHEM1003 or CHEM1007 or CHEM1009 or CHEM1401	Y	Y	1	Dec	100	Dr W T Chan, Chemistry

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				2012- 2013	2013- 2014	0=year long 1=1st sem * 2=2nd sem S=summer			
•	of Chemistry (Cont'd)								
	Chemical process industries and analysis	6	Pass in CHEM1002 or CHEM1502 or CHEM1007 or CHEM1009	Y	Y	2	May	100	Prof K Y Chan, Chemistry
	Introduction to materials chemistry	6	Pass in CHEM1003 or CHEM1009 or CHEM1401	Y	Y Y	0	Dec No exam	100	Prof W K Chan, Chemistry
	Directed studies in chemistry	6	Pass in CHEM1002 or CHEM1003 or CHEM1004 or CHEM1406 or CHEM2507 or CHEM2510.						Prof D L Phillips, Chemistry
CHEM2202	Chemical instrumentation	6	Pass in CHEM1002 or (CHEM1004 and CHEM2510) or CHEM1007 or CHEM1009	Y	Y	1	Dec	80	Dr W T Chan, Chemistry
CHEM2207	Food and water analysis	6	Pass in CHEM1002 or CHEM1003 or CHEM1004 or CHEM1007 or CHEM1009; and Pass in CHEM2202, or already enrolled in this course.	Y	Y	2	Мау	120	Dr Y S Fung, Chemistry
CHEM2303	Intermediate Inorganic Chemistry	6	Pass in CHEM1003; and Not for students who have already passed in CHEM2302 before.	Y	Y	1	Dec	80	Prof V W W Yam, Chemistry
CHEM2304	Bioinorganic Chemistry	6	Pass in CHEM1002 and CHEM1003 and CHEM2303	Y	Y	2	Мау	50	Prof H Z Sun, Chemistry
CHEM2403	Intermediate Organic Chemistry	6	Pass in CHEM1003; and Pass in CHEM2510, or already enrolled in this course; Not for students who have already passed in CHEM2402 before.	Y	Y	2	Мау	90	Prof D Yang, Chemistry
CHEM2410	Analytical techniques for pharmacy students	6	For BPharm students only; and Pass in CHEM1410	Y	Y	2	Мау	30	Dr W T Chan, Chemistry
CHEM2504	Physical Chemistry I: Introduction to Quantum Chemistry	6	Pass in CHEM1002; and Not for students who have already passed in CHEM2503 before.	Y	Y	2	Мау	80	Prof A S C Cheung, Chemistry
CHEM2509	Principles of chemical biology	6	Pass in CHEM1003 or CHEM1401 or CHEM1406 or BIOC1001	Y	Y	2	Мау	50	Dr X C Li, Chemistry
CHEM2510	Principles and applications of spectroscopic and analytical techniques	6	Pass in any CHEM1XXX level course; and Not for students who have already passed CHEM2507 before.	Y	Y	2	Мау	120	Dr X Li, Chemistry
CHEM3105	Chemistry project	12	Pass in CHEM2202; and CHEM2302 or CHEM2303; and CHEM2402 or CHEM2403; and CHEM2503 or CHEM2504	Y	Y	0	No exam		Prof D L Phillips, Chemistry
CHEM3106	Symmetry, group theory and applications	6	Pass in CHEM2303	Y	Y	1	Dec	60	Prof V W W Yam, Chemistry
CHEM3107	Interfacial science and technology	6	Pass in CHEM2503 or CHEM2504	Y	Y	2	Мау	50	Prof K Y Chan, Chemistry
CHEM3110	Advanced materials	6	Pass in CHEM2109	Y	Y	2	Мау	50	Prof W K Chan, Chemistry
CHEM3204	Modern chemical instrumentation and applications	6	Pass in CHEM2202	Y	Y	1	Dec	50	Dr I K Chu, Chemistry
CHEM3206	Analytical Chemistry	6	Pass in CHEM2202 or CHEM2207	Y	Y	2	Мау	100	Dr Y S Fung, Chemistry
	Organometallic chemistry	6	Pass in CHEM2303	Y	Y	1	Dec	40	Prof V W W Yam, Chemistry
CHEM3305	Advanced Inorganic Chemistry	6	Pass in CHEM2302 or CHEM2303; and Pass in CHEM3106, or already enrolled in this course; and Not for students who have passed in CHEM3303 before.	Y	Y	1	Dec	40	Prof C M Che, Chemistry
CHEM3404	Advanced organic chemistry	6	Pass in CHEM2402 or CHEM2403	Y	Y	1	Dec	50	Prof D Yang, Chemistry
CHEM3405	Organic chemistry of life	6	Pass in CHEM1401 or CHEM1406 or CHEM2402 or CHEM2403	Y	Y	1	Dec	50	Dr P H Toy, Chemistry
CHEM3406	Integrated Organic Synthesis	6	Pass in CHEM2402 or CHEM2403; and Not for students who have passed in CHEM3403 before.	Y	Y	2	Мау		Prof P Chiu, Chemistry
	Medicinal chemistry	6	Pass in CHEM1003 or CHEM2402 or CHEM2403 or CHEM3405	Y	Y	2	Мау	140	Prof H Z Sun, Chemistry
CHEM3410	Medicinal chemistry for pharmacy students	6	For BPharm students only; and (CHEM1401 or CHEM1411) and CHEM2410	Y	Y	2	Мау	30	Prof H Z Sun, Chemistry
CHEM3505	Molecular spectroscopy	6	Pass in CHEM2503	N	N			132	Prof D L Phillips, Chemistry

Course Code	Title	Credit Pre-requisite		Available in		offered in 2012-2013			Course Coordinator
				2012- 2013	2013- 2014	0=year long 1=1st sem * 2=2nd sem S=summer			
-	of Chemistry (Cont'd)								
	Computational chemistry	6	Pass in CHEM2503 or PHYS2323; and Not for students who have passed in CHEM6109, or have already enrolled in this course.	Y	Y	2	Мау	60	Prof G H Chen, Chemistry
CHEM3507	Physical Chemistry II: Statistical Thermodynamics and Kinetic Theory	6	Pass in CHEM2504; and Not for students who have already passed in CHEM2503 before.	Y	Y	1	Dec	40	Dr H Hu, Chemistry
CHEM3513	Advanced physical chemistry	6	Pass in CHEM2503; and Not for students who have already passed in CHEM3504 before.	N	N			40	Prof G H Chen, Chemistry
CHEM3901	HKUtopia: Capstone Experience for Chemistry Undergraduates	6	Students are expected to have satisfactorily completed all introductory chemistry core courses and at least four advanced chemistry core courses. Students who are interested in taking the course should contact the Department for application.	Y	Y	S	No exam		Dr A P L Tong, Chemistry
CHEM3988	Chemistry internship	6	Students are expected to have satisfactorily completed their Year 2 study.	Y	Y	1, 2, S	No exam		Dr W T Chan, Chemistry
ENVS2008	Pollution	6	Pass in ENVS0001 or CHEM1009 or BIOL0126 or ENVS1002	Y	Y	2	Мау	60	Dr W T Chan, Chemistry
School of C CSCI0001	hinese Practical Chinese language course for science students	3	NIL (This course is compulsory for all BSc students)	Y	Y	1	Dec		Mr K W Wong, Chinese
CSCI2002	Advanced language studies in Chinese	3	Pass in CSCI0001	Y	Y	1	No exam		Mr K W Wong, Chinese
	of Earth Sciences	•	<b>N</b> 111						D KILL I
EASC0003 EASC0004	Natural hazards and geological risk Early Life on Earth	6	NIL	N Y	N Y	2	 May		Dr K H Lemke, Earth Sciences Dr K H Lemke,
EASC0009	Peaceful use of nuclear	6	Not for students who have already	Ý	Y	1	Dec		Earth Sciences Dr S H Li,
	technologies		passed in EASC0002 before.		-				Earth Sciences
EASC0105	Earth through time	6	NIL	Y	Y	2	Мау		Dr Y Li, Earth Sciences
EASC0116	Introduction to physical geology	6	NIL	Y	Y	1	Dec		Prof L S Chan, Earth Sciences
EASC0117	Geological heritage of Hong Kong	3	NIL	Y	N	2	No exam	45	Prof M F Zhou, Earth Sciences
EASC0118	Blue planet	6	NIL	Y	Y	1, 2	Dec, May		Dr P Bach, Earth Sciences
EASC0122	Introduction to climate science	6	NIL	Y	Y	2	Мау		Dr Z Liu, Earth Sciences
EASC1123	Planetary geology	6	E or above in AL Biol or Chem or Phys or Pure Math or Applied Math or Engineering Science	Y	Y	2	Мау		Dr M H Lee, Earth Sciences
EASC2004	Geophysics	6	Pass in EASC0116 or EASC0118	Y	Y	2	Мау		Prof L S Chan, Earth Sciences
EASC2005	Meteorology	6	Pass in PHYS0610 or PHYS0629	Y	Y	1	Dec		Dr Z Liu, Earth Sciences
EASC2108	Structural geology	6	Pass in EASC0116 or EASC0118	Y	Y	2	Мау	40	Dr J R Ali, Earth Sciences
EASC2109	Igneous and metamorphic petrology	6	Pass in EASC0116 or EASC0118	Y	Y	2	May	30	Prof M Sun, Earth Sciences
EASC2112	Earth systems	6	Pass in EASC0118 or EASC0116 or EASC0105	Y	Y	1	Dec		Prof J G Malpas, Earth Sciences
EASC2113	Sedimentology	6	Pass in EASC0105 or EASC0116 or EASC0118	Y	Y	2	May		Dr S C Chang, Earth Sciences
EASC2124	Geological maps and air photographs	6	Pass in EASC0118 or EASC0105 or EASC0116	Y	Y	2	No exam		Dr P Bach, Earth Sciences
EASC2125	Global tectonics	6	Pass in EASC0118 or EASC0105 or EASC0116	Y	Y	2	Мау		Prof J G Malpas, Earth Sciences
EASC2126	Mineralogy and geochemistry	6	Pass in EASC0118 or EASC0105 or EASC0116	Y	Y	1	Dec	30	Prof M Sun, Earth Sciences
EASC2127	Global change: anthropogenic impact	6	Pass in EASC0121 or EASC0105 or EASC0118	Y	N	1	Dec		Dr Z Liu, Earth Sciences
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				2012- 2013	2013- 2014	0=year long 1=1st sem * 2=2nd sem S=summer			
Department	of Earth Sciences (Cont'd)		·						
EASC2201	Hydrogeology	6	Pass in EASC0116 or EASC0118	Y	Y	1	Dec	40	Prof J J Jiao, Earth Sciences
EASC2301	Field camps	6	Pass in at least 42 credits of EASC courses.	Y	Y	2	No exam		Prof J G Malpas, Earth Sciences
EASC2307	Directed studies in earth sciences	6	Pass in at least 18 credits of EASC0XXX level or EASC1XXX level courses; and GPA of 2.5 or above.	Y	Y	0	No exam		Prof M Sun, Earth Sciences
EASC3132	Earth resources	6	Pass in EASC0116 or EASC0118	Y	Y	1	Dec	40	Prof M F Zhou, Earth Sciences
EASC3133	Applied geochemistry	6	Pass in EASC2126	Y	Y	1	Dec	50	Dr K H Lemke, Earth Sciences
EASC3134	Regional geology	6	Pass in EASC2108 and EASC2125	Y	Y	1	Dec	40	Dr J R Ali, Earth Sciences
EASC3202	Soil and rock mechanics	6	Pass in EASC2201, or already enrolled in this course	Y	Y	2	Мау	40	Prof J J Jiao, Earth Sciences
EASC3203	Engineering geology	6	Pass in EASC2201, or already enrolled in this course	Y	Y	2	Мау	40	Prof J J Jiao, Earth Sciences
EASC3308	Earth sciences project	12	Pass in at least 18 credits of EASC2XXX level and EASC3XXX level courses; and GPA of 3.0 or above; and Major in Earth Sciences.	Y	Y	0	No exam		Prof M Sun, Earth Sciences
EASC3988	Earth sciences internship	6	Students are expected to have satisfactorily completed their Year 2 study.	Y	Y	1, 2, S	No exam		Prof L S Chan, Earth Sciences
ENVS0001	Introduction to environmental science	6	NIL	Y	Y	1	Dec		Dr Y Zong, Earth Sciences
ENVS2004	Environment and society	6	Pass in ENVS0001 or EASC0118	Y	Y	2	Мау		Dr Y Zong, Earth Sciences
ENVS2007	Natural hazards and mitigation	6	Pass in ENVS0001 or EASC0118 or EASC0003	Y	Y	1	Dec		Dr Y Zong, Earth Sciences
ENVS2011	Directed studies in environmental science	6	Pass in any three of these courses: BIOL0126, CHEM0008, CHEM1009, EASC0118, ENVS0001, ENVS1002, PHYS0625, PHYS1417; and GPA 2.5 or above in Year 1 courses; and Major in Environmental Science.	Y	Y	0	No exam		Dr Y Zong, Earth Sciences
ENVS2013	Environmental Oceanography	6	Pass in EASC0118; and Not for students who have passed in EASC2129.	N	Y				Dr Y Zong, Earth Sciences
ENVS3015	Environmental science project	12	Pass in at least 18 credits of level 2 and level 3 courses in Environmental Science major; and Students must have a GPA of 3.0 or above; and Major in Environmental Science.	Y	Y	0	No exam		Dr Y Zong, Earth Sciences
	of Mathematics Numbers and patterns in	3	E or above in HKCEE Math	N	N				Head of Dept,
MATH0201	nature and life Basic calculus	6	E or above in HKCEE Mathematics; and	Y	N	1	Dec		Mathematics Dr C W Wong, Mathematics
			Not for students with E or above in HKCEE Add. Math or AS Math and Stat or AL Pure Math; and Not for students who have already passed in MATH0801 or before; and Not for students who have passed MATH0211, or have already enrolled in this course.						
MATH0211	Basic applicable mathematics	6	(E or above in HKCEE Math or HKCEE Add. Math or AS Math & Stat); and Not for students with E or above in AL Pure Math; and Not for students who have already passed in MATH0801 before; and Not for students who have passed in MATH0201, or have already enrolled in this course.	Y	N	1, 2	Dec, May		Dr C W Wong, Mathematics

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Department	of Mathematics (Cont'd)								
MATH1001	Fundamental concepts of mathematics	6	E or above in HKCEE Add. Math or AS Math & Stat; and Not for students who have already passed in MATH1101 before; and Not for students who have already passed in MATH1201 before.	Y	Y	1, 2	Dec, May		Dr Y M Chan, Mathematics
MATH1111	Linear algebra	6	(E or above in (HKCEE Add. Math and AS Math & Stat); or E or above in AL Pure Math; or Pass in MATH1804); and Not for students who have already passed in MATH1101 before; and Not for students who have already passed in MATH1102 before.	Y	N	1, 2	Dec, May		Dr Y K Lau, Mathematics
MATH1211	Multivariable calculus	6	(E or above in (HKCEE Add. Math and AS Math & Stat); or E or above in AL Pure Math; or Pass in MATH1804); and Not for students who have already passed in MATH1202 before.	Y	Y	1, 2	Dec, May		Dr G Han, Mathematics
MATH1611	Mathematical laboratory and modeling	6	E or above in HKCEE Add. Math or AS Math & Stat	Y	Y	2	Мау	20	Dr K H Chan, Mathematics
MATH1804	University mathematics A	6	(E or above in HKCEE Add. Math or AS Math & Stat; or Pass in MATH0201 or MATH0211); and Not for students with E or above in AL Pure Math; and Not for students who have passed in MATH1805 or MATH1211, or have already enrolled in these courses; and Not for students who have already passed in MATH0802 or MATH1811 or MATH1812 before.	Y	N	1, 2	Dec, May		Dr Y M Chan, Mathematics
MATH1805	University mathematics B	6	E or above in (HKCEE Add. Math and AS Math & Stat) or AL Pure Math; and Not for students who have passed in MATH1211 or MATH1813, or have already enrolled in these courses; and Not for students who have already passed in MATH1202 or MATH1803 or MATH1811 or MATH1812 before.	Y	N	2	Мау		Dr C W Wong, Mathematics
MATH1813	Mathematical methods for actuarial science	6	E or above in AL Pure Math; and Not for students who have already passed in MATH1202 or MATH1803 before; and Not for students who have passed in MATH1211 or MATH1805, or have already enrolled in these courses.	Y	N	1	Dec		Dr C W Wong, Mathematics
MATH2001	Development of mathematical ideas	6	Pass in MATH1111 and MATH1211	N	Y				Head of Dept, Mathematics
MATH2002	Mathematics seminar	6	Pass in (MATH1001, MATH1111 and MATH1211); or Pass in (MATH1001 and MATH1111) and already enrolled in MATH1211; or Pass in MATH1001; and MATH1211) and already enrolled in MATH1111. (This course is for first year BSc students only.)	Y	N	2	Мау	12	Dr T W Ng, Mathematics
	Introduction to mathematical	6	Pass in MATH1211 or MATH1805	Y	Y	1, 2	Dec, May		Dr J T Chan,

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				2012- 2013	1	0=year long 1=1st sem * 2=2nd sem S=summer			
-	t of Mathematics (Cont'd)	-				4	P		DYK
MATH2301	Algeora I	6	Pass in (MATH1101 and MATH1102) or (MATH1101 and MATH1201) or (MATH1101 and MATH1202) or (MATH1102 and MATH1202) or (MATH1102 and MATH1202) or MATH1110 or MATH1803 or MATH1111 or MATH1805 or MATH1811 or MATH1812 or MATH1813	Y	Y	1	Dec		Dr Y K Lau, Mathematics
MATH2303	Matrix theory and its applications	6	Pass in (MATH1101 and MATH1102) or MATH1111 or MATH1803 or MATH1804 or MATH1805 or MATH1811 or MATH1812 or MATH1813	Y	Y	1	Dec		Dr Fullwood, Mathematics
MATH2304	Introduction to number theory	6	Pass in (MATH1101 and MATH1102) or (MATH1111 and MATH1211); and Pass in MATH2301, or already enrolled in this course.	Y	Y	2	May		Prof K M Tsang, Mathematics
MATH2401	Analysis I	6	Pass in (MATH1201 and MATH1202) or MATH1211 or MATH1803 or or MATH1804 or MATH1805 or MATH1811 or MATH1812 or MATH1813; and Pass in MATH2201, or already enrolled in this course.	Y	Y	1	Dec		Prof W S Cheung, Mathematics
MATH2402	Analysis II	6	Pass in ((MATH1201 and MATH1202) and (MATH1101 or MATH1102)) or (MATH1111 and MATH1211) or MATH1803 or MATH1804 or MATH1805 or MATH1811 or MATH1812 or MATH1813; and Pass in MATH2201, or already enrolled in this course; and Pass in MATH2401, or already enrolled in this course.	Y	Y	2	Мау		Dr P P W Wong, Mathematics
MATH2403	Functions of a complex variable	6	Pass in (MATH1101 and MATH1102) or (MATH1101 and MATH1201) or (MATH1101 and MATH1202) or (MATH1102 and MATH1202) or (MATH1102 and MATH1202) or MATH1211 or MATH1803 or MATH1804 or MATH1805 or MATH1811 or MATH1812 or MATH1813; and Pass in MATH2201, or already enrolled in this course.	Y	Y	1	Dec		Prof N Mok, Mathematics
MATH2405	Differential equations	6	Pass in (MATH1101 and MATH1102) or (MATH1101 and MATH1201) or (MATH1101 and MATH1202) or (MATH1102 and MATH1202) or (MATH1102 and MATH1202) or MATH1111 or MATH1211 or MATH1803 or MATH1804 or MATH1805 or MATH1801 or MATH1812 or MATH1813	Y	Y	2	Мау		Prof J H Lu, Mathematics
MATH2408	Computational methods and differential equations with applications	6	Pass in MATH1111 or MATH1211 or MATH1611 or MATH1803 or MATH1804 or MATH1805 or MATH1813	Y	Y	2	Мау		Dr W K Ching, Mathematics
MATH2600	Discrete mathematics	6	Pass in any two of MATH1XXX level or MATH2XXX or MATH3XXX level courses; and Not for students who have already passed MATH1800 before.	Y	Y	1	Dec		Prof W Zang, Mathematics

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				2012- 2013		0=year long 1=1st sem * 2=2nd sem S=summer			
Department	of Mathematics (Cont'd)								
MATH2601	Numerical analysis	6	Pass in MATH1201 and (MATH1101 or MATH1102 or MATH1202); or Pass in MATH1202 and (MATH1101 or MATH1102 or MATH1201); or Pass in (MATH1811 or MATH1803) or (MATH1812 or MATH1803); or Pass in MATH1111 or MATH1211 or MATH1804 or MATH1805 or MATH1813.	Y	Y	1	Dec		Dr K H Chan, Mathematics
MATH2603	Probability theory	6	Pass in (MATH0801 and MATH0802) or (MATH1201 and MATH1202) or (MATH1811 and MATH1812) or MATH1111 or MATH1211 or MATH1803 or MATH1804 or MATH1805 or MATH1813	Y	Y	1	Dec		Dr J Tsai, Mathematics
MATH2901	Operations research I	6	Pass in MATH1101 and (MATH1102 or MATH1201 or MATH1202); or Pass in MATH1102 and (MATH1101 or MATH1201 or MATH1202); or Pass in MATH1111 or MATH1211 or MATH1804 or MATH1805 or MATH1813.	Y	Y	1	Dec		Prof S C K Chu, Mathematics
MATH2904	Introduction to optimization	6	Pass in ((MATH1101 or MATH1102) and (MATH1201 or MATH1202)) or MATH1111 or MATH1211 or MATH1804 or MATH1805 or MATH1813; and Pass in MATH2201, or already enrolled in this course.	Y	Y	2	Мау		Prof W Zang, Mathematics
MATH2905	Queueing theory and simulation	6	Pass in (STAT1301 and (MATH1101 or MATH1102) and (MATH1201 or MATH1202)) or MATH1111 or MATH1211 or MATH1804 or MATH1805 or MATH1813; and Pass in MATH2603, or already enrolled in this course.	N	Y				Head of Dept, Mathematics
MATH2906	Financial calculus	6	Pass in (STAT1301 and (MATH1101 or MATH1102) and (MATH1201 or MATH1202)) or MATH1111 or MATH1211 or MATH1804 or MATH1805 or MATH1813; and Pass in MATH2603, or already enrolled in this course.	Y	Y	1	No exam		Dr S P Yung, Mathematics
MATH2911	Game theory and strategy	6	Pass in (MATH1101 and MATH1102) or (MATH1201 and MATH1202) or MATH1211 or MATH1001 or MATH1111 or MATH1804 or MATH1805 or MATH1813	Y	Y	1	No exam		Dr T W Ng, Mathematics
MATH2999	Directed studies in mathematics	6	Pass in (MATH1101 and MATH1102 and MATH1201 and MATH1202) or (MATH1111 and MATH1211); and Pass in MATH2201, or already enrolled in this course; and Pass in MATH2301, or already enrolled in this course; and Pass in MATH2401, or already enrolled in this course.	Y	Y	1, 2	No exam		Dr T W Ng, Mathematics
MATH3302	Algebra II	6	Pass in MATH2301	Y	Y	2	Мау		Prof J T Yu, Mathematics
MATH3404	Functional analysis	6	Pass in (MATH1101 and MATH1102 and MATH1201 and MATH1202 and MATH2401) or (MATH1111 and MATH1211 and MATH2201 and MATH2401)	Y	Y	2	Мау		Dr C W Wong, Mathematics

Course Code	Title	Credit	Pre-requisite		able in	Semester offered in 2012-2013	Exam held in 2012-2013	Quota	Course Coordinator
				2012- 2013		0=year long 1=1st sem * 2=2nd sem S=summer			
Department	t of Mathematics (Cont'd)								
MATH3406	Introduction to partial differential equations	6	Pass in MATH1111 and MATH1211 and MATH2201 and MATH2401; and Pass in MATH2405, or already	Y	Y	1	No exam		Dr S P Yung, Mathematics
	Coometry	6	enrolled in this course.	Y	Y	1	Dee		Dr P P W Wong,
MATH3501	Geometry	0	Pass in (MATH1101 and MATH1102 and MATH1201 and MATH1202 and MATH2401) or (MATH1111 and MATH2211 and MATH2201 and MATH2401)	Y	Y		Dec		Mathematics
MATH3511	Introduction to differentiable manifolds	6	Pass in (MATH2301 or MATH2303) and MATH2401 and MATH3501; and Pass in MATH2402, or already enrolled in this course.	Y	Y	2	Мау		Dr P P W Wong, Mathematics
MATH3602	Scientific computing	6	Pass in (MATH1101 and MATH1102 and MATH1201 and MATH1202) or (MATH1111 and MATH1201); and Pass in MATH2601, or already enrolled in this course.	N	Y				Head of Dept, Mathematics
MATH3902	Operations research II	6	MATH101 and MATH102) or (MATH1101 and MATH1201) or (MATH1101 and MATH1201) or (MATH1102 and MATH1202) or (MATH1102 and MATH1202) or (MATH1102 and MATH1202) or (MATH1111 and MATH1211); and Pass in MATH2901, or already enrolled in this course.	N	Y				Head of Dept, Mathematics
MATH3903	Network models in operations research	6	Pass in (MATH1101 and MATH1102) or (MATH1101 and MATH1201) or (MATH1101 and MATH1201) or (MATH1102 and MATH1201) or (MATH1102 and MATH1202) or (MATH1112 and MATH1202) or (MATH1111 and MATH1211); and Pass in MATH2901, or already enrolled in this course.	Y	Y	2	Мау		Prof S C K Chu, Mathematics
MATH3907	Numerical methods for financial calculus	6	Pass in ((MATH1101 or MATH1102) and (MATH1201 or MATH1202)) or MATH1111 or MATH1202)) or MATH1111 or MATH1211 or MATH1804 or MATH1805 or MATH1813; and Pass in MATH2603, or already enrolled in this course; and Pass in MATH2906, or already enrolled in this course.	N	Y				Head of Dept, Mathematics
MATH3988	Mathematics internship	6	Students are expected to have satisfactorily completed their Year 2	Y	Y	1, 2, S	No exam		Dr T W Ng, Mathematics
MATH3999	Mathematics project	12	study. Pass in (MATH1101 and MATH1102 and MATH1201 and MATH1202 and MATH2301 and MATH2401) or (MATH1111 and MATH1211 and MATH2201 and MATH2301 and MATH2401)	Y	Y	0	No exam		Dr T W Ng, Mathematics
MATH6501	Topics in algebra	6	Pass in (MATH101 and MATH102 and MATH1201 and MATH1202 and MATH1201 and MATH1202 and MATH2301) or (MATH1111 and MATH2301) or (MATH2301); and Pass in MATH3302, or already enrolled in this course.	Y	Y	2	May		Prof J T Yu, Mathematics
MATH6502	Topics in applied discrete mathematics	6	Pass in MATH2600; and Pass in MATH2301, or already enrolled in this course.	Y	Y	2	Мау		Prof S C K Chu, Mathematics
MATH6503	Topics in mathematical programming and optimization	6	(Pass MATH2901 and MATH2904); and (Pass in MATH3902, or already enrolled in this course); and (Pass in MATH3903, or already enrolled in this course).	N	Y				Head of Dept, Mathematics

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				2012- 2013		0=year long 1=1st sem * 2=2nd sem S=summer	-		
Department	t of Mathematics (Cont'd)	!	1			• • • • • • • • • • • • • • • • • • • •			1
MATH6504	Geometric topology	6	Pass in (MATH1101 and MATH1102 and MATH1201 and MATH1202 and MATH2301 and MATH2401) or (MATH1111 and MATH1211 and MATH2201 and MATH2301 and MATH2401)	N	Y				Head of Dept, Mathematics
MATH6505	Real analysis	6	Pass in MATH2401	Y	Y	2	Мау		Prof W S Cheung, Mathematics
	t of Physics		1						Induitornatioo
PHYS0003	Nature of the Universe	6	Nil (Not for students who have already passed in PHYS0001 or PHYS0002 before.)	Y	Y	1, 2	Dec, May		Dr K M Lee, Physics
PHYS0612	Revealing the Magic in Everyday Life	6	NIL (Not for students who have already passed in PHYS0607 before.)	Y	Y	2	May		Dr M K Yip, Physics
PHYS0625	Physics by inquiry	6	E or above in HKCEE Phys; and Not for students with E or above in AL Phys; and Not for students who have passed in PHYS1414 or PHYS1415 or PHYS1417, or already enrolled in these courses.	Y	Y	1	Dec		Dr F K Chow, Physics
PHYS0629	Weather and climate	6	E or above in HKCEE Phys	Y	Y	1	Dec	70	Dr K M Lee,
PHYS1315	Methods in physics I	6	(E or above in AL Pure Math or AS Math & Stat or HKCEE Add Math; or Pass in MATH1804); and Not for students who have already passed in MATH1811 before; and Not for students who have already passed in MATH1812 before.	Y	Y	1	Dec		Physics Dr F K Chow, Physics
PHYS1316	Methods in physics II	6	(E or above in AL Pure Math or AS Math & Stat or HKCEE Add Math; or Pass in PHYS1315 or MATH1804); and Not for students who have already passed in MATH1811 before; and Not for students who have already passed in MATH1812 before.	Y	Y	2	Мау		Dr W Yao, Physics
PHYS1414	General physics I	6	(E or above in HKCEE Add Math or AS Math & Stat or AL Pure Math); and (E or above in AL Phys or AS Phys or AL Eng Sc; or Pass in PHYS0114 or PHYS0625); and Not for students who have already passed in PHYS1111 or PHYS1112 or PHYS1113 or PHYS1314 before.		N	1, 2	Dec, May		Dr M K Yip, Physics
PHYS1415	General physics II	6	(E or above in HKCEE Add Math or AS Math & Stat or AL Pure Math); and (E or above in AL Phys or AS Phys or AL Eng Sc; or Pass in PHYS0115 or PHYS0625); and Not for students who have already passed in PHYS1111 or PHYS1112 or PHYS1113 or PHYS1314 before.		N	2	May		Dr J C S Pun, Physics
PHYS1417	Basic physics	6	(E or above in AL Phys or AS Phys or AL Eng Sc; or Pass in PHYS0625); and Not for students who have already passed in any of the following courses before: PHYS0114, PHYS0115, PHYS1111, PHYS0115, PHYS1113, PHYS1413; and Not for students who have passed in PHYS1414 or PHYS1415, or have already enrolled in either course.	Y	N	1, 2	Dec, May		Dr S J Xu, Physics

Course Code	Title	Credit	Pre-requisite	Availa	able in	Semester offered in 2012-2013	Exam held in 2012-2013	Quota	Course Coordinator
				2012- 2013		0=year long 1=1st sem * 2=2nd sem S=summer			
Department	of Physics (Cont'd)		·						
PHYS2021	The physical universe	6	Pass in PHYS0001 or PHYS0003	Y	Y	1	Dec		Dr K M Lee, Physics
PHYS2022	Observational astronomy	6	Pass in PHYS0001 or PHYS0002 or PHYS0003	Y	Y	1	Dec	30	Dr J J L Lim, Physics
PHYS2039	Principles of astronomy	6	Pass in PHYS1413 or PHYS1414 or PHYS1415 or PHYS1417	Y	Y	2	Мау		Dr J J L Lim, Physics
PHYS2221	Introductory solid state physics	6	Pass in PHYS1413 or PHYS1417 or (PHYS1414 and PHYS1415); and Pass in PHYS2627, or already	Y	Y	1	Dec		Prof J Gao, Physics
PHYS2222	Waves and optics	6	enrolled in this course. Pass in PHYS1413 or PHYS1417 or	Y	Y	1	Dec		Dr J K C Leung,
PHYS2227	Laser and spectroscopy	6	(PHYS1414 and PHYS1415) Pass in PHYS2222 and PHYS2323; and Pass in PHYS2221, or already enrolled in this course.	N	Y				Physics Dr S J Xu, Physics
PHYS2235	Physics of nanomaterials	6	Pass in PHYS2323; and Pass in PHYS2221, or already enrolled in this course.	N	N				Dr S J Xu, Physics
PHYS2321	Introductory electromagnetism	6	Pass in PHYS1414 and PHYS1415 and PHYS2627	Y	Y	2	May		Dr X D Cui, Physics
PHYS2322	Statistical mechanics and thermodynamics	6	Pass in PHYS1414 and PHYS1415 and PHYS2627	Y	Y	2	Мау		Prof S Fung, Physics
PHYS2323	Introduction to quantum mechanics	6	Pass in PHYS2627	Y	Y	1	Dec		Dr W Yao, Physics
PHYS2325	Theoretical physics	6	Pass in PHYS1414 or PHYS1415 or PHYS2627; and Pass in (PHYS1315 and PHYS1316) or (MATH1804 and MATH1805) or (MATH1111 and MATH1211)		Y	1	Dec	50	Prof Z D Wang, Physics
PHYS2533	Directed studies in physics	6	Pass in one of these courses: PHYS0001, PHYS0002, PHYS0003, PHYS1303, PHYS1315, PHYS1316, PHYS1414, PHYS1415, PHYS1417	Y	Y	0	No exam		Dr H F Chau, Physics
PHYS2626	Introductory classical mechanics	6	Pass in PHYS1413 or PHYS1417 or PHYS1414	Y	Y	1	Dec		Dr F C C Ling, Physics
PHYS2627	Introductory quantum physics	6	Pass in PHYS1413 or PHYS1417 or PHYS1414 or PHYS1415; and Not for students who have already passed in PHYS1314 before.	Y	N	2	Мау		Dr F C C Ling, Physics
PHYS2628	Atomic and nuclear physics	6	Pass in PHYS2627 Introductory quantum physics	Y	Y	2	Мау		Dr S Zhang, Physics
PHYS3033	General relativity	6	Pass in PHYS1303 and PHYS2321 and PHYS2322 and PHYS2323	N	Y				Dr T C Harko, Physics
PHYS3034	Cosmology	6	Pass in PHYS2021 or PHYS2039	N	N				Dr T C Harko, Physics
PHYS3036	Interstellar medium	6	Pass in PHYS2039 and PHYS2321 and PHYS2323	Y	N	1	Dec		Dr M H Lee, Physics
PHYS3037	Selected topics in astrophysics	6	Pass in PHYS2321 and PHYS2322 and PHYS2323	Y	Y	1	Dec		Prof K S Cheng, Physics
PHYS3038	Planetary science	6	Pass in PHYS2322 or PHYS2626	N	Y				Dr M H Lee, Physics
PHYS3040	Stellar physics	6	Pass in PHYS2021 or PHYS2321 or PHYS2322 or PHYS2323		Y	2	Мау		Prof K S Cheng, Physics
PHYS3231	Computational physics	6	Pass in PHYS2321 and PHYS2322 and PHYS2323	Y	Y	2	Мау		Prof J Wang, Physics
PHYS3331	Electromagnetic field theory	6	Pass in PHYS2321 and PHYS2322 and PHYS2323 and (PHYS2325 or MATH2401 or MATH2301 or MATH2403 or MATH2405)	Y	Y	1	Dec		Dr X D Cui, Physics
PHYS3332	Quantum mechanics	6	Pass in PHYS2323 and (PHYS2325 or MATH2401 or MATH2301 or MATH2403 or MATH2405)	Y	Y	2	Мау		Prof F C Zhang, Physics

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Department	t of Physics (Cont'd)								
PHYS3336	Classical mechanics	6	Pass in PHYS2626 and (PHYS2325 or MATH2401 or MATH2301 or MATH2403 or MATH2405)	5 Y	Y	2	May		Prof S Q Shen, Physics
PHYS3431	Experimental physics	6	Pass in PHYS2321 and PHYS2322 and PHYS2323 and PHYS2626	N	Y			4	TBC, Physics
PHYS3531	Physics project	12	Pass in PHYS2321 and PHYS2323	Y	Y	0	No exam		Dr H F Chau, Physics
PHYS3987	Quantitative tools in physics	0	Pass in PHYS1414 and PHYS1415 and PHYS2627	Y	Y	0	No exam	20	Dr F K Chow, Physics
PHYS3988	Physics internship	6	Students are expected to have satisfactorily completed their Year 2 study.	Y	Y	1, 2, S	No exam		Dr F C C Ling, Physics
PHYS6501	Computer controlled measurements in physics	6	Pass in PHYS3331 or PHYS3431	N	N				Dr A B Djurišić, Physics
PHYS6502	Advanced statistical mechanics	6	Pass in PHYS2322 and PHYS2627 and (PHYS3332 or PHYS3336)	Y	N	1	Dec		Prof J Wang, Physics
PHYS6503	Advanced electromagnetic field theory	6	Pass in PHYS3331	Y	Y	2	Мау	50	Prof Z D Wang, Physics
PHYS6504	Advanced quantum mechanics	6	Pass in PHYS3332	Y	Y	1	Dec		Prof S Q Shen, Physics
PHYS6505	Solid state physics	6	Pass in PHYS2221 and PHYS2322 and PHYS3332	N	Y				Prof J Wang, Physics
ENVS2006	Environmental radiation	6	Pass in ENVS0001 or PHYS1417	N	N				Dr J K C Leung, Physics
ENVS2010	Sustainable energy and environment	6	Pass in ENVS0001 or PHYS1417	N	Y				Dr A B Djurišić, Physics
Faculty of S SCNC2005	Career development for science students	0	Students are expected to have satisfactorily completed their Year 1 study.	Y	Y	1, 2	No exam	200	Dr N K Tsing, Faculty
SCNC2988	Service learning internship	0	Students are expected to have satisfactorily completed their Year 1 study.	Y	Y	S	No exam		Dr N K Tsing, Faculty
Statistics a	nd Actuarial Science		Study.						1
STAT0301	Elementary statistical methods	6	E or above in HKCEE Math; and Not for student with E or above in AL PM; and Not for student with E or above in AS Math & Stat; and Not for students who have passed or enrolled in any of the following courses: STAT1801, STAT0302, STAT1301, STAT1306, ECON1003	Y	Y	1, 2	Dec, May		Mrs G M Jing, Statistics and Actuarial Science
STAT0302	Business statistics	6	For Business School students only; and Not for students who have passed or enrolled in any of the following courses: STAT0301, STAT1301, STAT1306, STAT1801, ECON1003	Y	Y	1, 2	Dec, May		Dr K S Chong, Statistics and Actuaria Science
STAT1301	Probability and statistics I	6	(E or above in AL PM; or Pass in MATH0211); and Not for students who have passed in STAT1306, or have already enrolled in this course; and Not for students who have passed in STAT1801, or have already enrolled in this course.	Y	Y	1	Dec		Dr Y K Chung, Statistics and Actuarial Science
STAT1302	Probability and statistics II	6	Pass in STAT1301	Y	Y	2	Мау		Dr J F Yao, Statistics and Actuaria Science
STAT1303	Data management	6	(E or above in HKCEE Math or AS Math & Stat or AL PM); and Pass or already enrolled in any of the following courses: BIOL1608 or BIOL2608, ECON1003, STAT0301, STAT0302, STAT1301, STAT1306, STAT1801	Y	Y	1, 2	Dec, May		Dr C W Kwan, Statistics and Actuarial Science

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				2012- 2013		0=year long 1=1st sem * 2=2nd sem S=summer				
•	t of Statistics & Actuarial Sc		,			-	••			
STAT1304	Design and analysis of sample surveys	6	(E or above in HKCEE Math or AS Math & Stat or AL PM); and Pass or already enrolled in any of the following courses: BIOL1608 or BIOL2608, ECON1003, STAT0301, STAT0302, STAT1301, STAT1306, STAT1801	Y	Y	2	Мау		Ms O T K Choi, Statistics and Actuarial Science	
STAT1306	Introductory statistics	6	(E or above in AL PM or AS Math & Stat) or ((C or above in AL Phys) or (Pass in MATH0801) or (Pass in MATH0802) or (Pass in MATH0201, or already enrolled in this course) or (Pass in MATH1804, or already enrolled in this course)); and Not for students who have passed or already enrolled in any of these courses: STAT0301, STAT0302, STAT1301, STAT1801	Y	Y	1	Dec		Dr E K F Lam, Statistics and Actuarial Science	
STAT1323	Introduction to demographic and socio-economic statistics	6	(E or above in HKCEE Math or AS Math & Stat or AL Pure Maths); and Pass or already enrolled in any of these courses: BIOL1608 or BIOL2608, ECON1003, STAT0301, STAT0302, STAT1301, STAT1306, STAT1801; and Not for students who have already passed in STAT1305 before.	Y	Y	2	May		Ms L M S Kwan, Statistics and Actuarial Science	
STAT1801	Probability and statistics: foundations of actuarial science	6	(E or above in AL Pure Math or AS Math & Stat; or (Pass in MATH1813, or already enrolled in this course); and Not for students who have passed or enrolled in any of these courses: STAT0301, STAT10302, STAT1301, STAT1306.	Y	Y	1	Dec		Dr Y K Chung, Statistics and Actuarial Science	
STAT1802	Financial mathematics	6	(E or above in AL Pure Math or AS Math & Stat); and (Pass in STAT1302, or already enrolled in this course; or Pass in STAT1801, or already enrolled in this course); and Not for students who have passed in STAT2315, or have already enrolled in this course.	Y	Y	2	Мау		Prof K C Yuen, Statistics and Actuarial Science	
STAT2301	Linear statistical analysis	6	Pass in STAT1302; and Not for students who have passed in STAT2804, or have already enrolled in this course.	Y	Y	1	Dec		Prof T W K Fung, Statistics and Actuarial Science	
STAT2302	Statistical inference	6	Pass in STAT1302 or STAT2802	Y	Y	1	Dec		Prof S M S Lee, Statistics and Actuarial Science	
STAT2303	Probability modelling	6	Pass in STAT1301; and Not for students who have passed in MATH2603, or have already enrolled in this course; and Not for students who have passed in STAT2803, or have already enrolled in this course.	Y	Y	1	Dec		Dr K S Chong, Statistics and Actuarial Science	
STAT2304	Design and analysis of experiments	6	Pass in STAT1302 or STAT2802 or STAT2311	Y	Y	2	May		Dr G Li, Statistics and Actuarial Science	
STAT2305	Quality control and management	6	Pass in BIOL1608 or BIOL2608 or ECON1003 or STAT0301 or STAT0302 or STAT1301 or STAT1306 or STAT1801 or STAT2802	Y	Y	2	Мау		Dr K S Chong, Statistics and Actuarial Science	

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				2012- 2013		0=year long 1=1st sem * 2=2nd sem S=summer	-		
Department	of Statistics & Actuarial Sc	ience (	Cont'd)						
STAT2306	Business logistics	6	Pass in BIOL1608 or BIOL2608 or ECON1003 or STAT0301 or STAT0302 or STAT1301 or STAT1306 or STAT1801; and Not for students who have passed MATH2901, or have already enrolled in this course.	Y	Y	1	Dec		Ms O T K Choi, Statistics and Actuarial Science
STAT2307	Statistics in clinical medicine and bio-medical research	6	Pass in STAT1302 or STAT2802	Y	Y	2	Мау		Dr G Yin, Statistics and Actuarial Science
STAT2308	Statistical genetics	6	Pass in STAT1302 or STAT2802	Y	Y	2	May		Prof T W K Fung, Statistics and Actuarial Science
STAT2309	The statistics of investment risk	6	Pass in STAT1302 or STAT1306 or STAT2311 or STAT2314; and Not for students who have passed in FINA2802, or have already enrolled in this course. (Any student who has already passed in BIOL1608 or BIOL2608 or ECON1003 or STAT0301 or STAT0302 or STAT1301 or STAT1801 in 2009-10 or before can still apply for this course.) (Not available to Actuarial Science students)	Y	Y	1	Dec		Mr K P Wat, Statistics and Actuarial Science
STAT2310	Risk management and insurance	6	Pass in BIOL1608 or BIOL2608 or ECON1003 or STAT0301 or STAT0302 or STAT1301 or STAT1306 or STAT1801. (Not available to Actuarial Science students)	Y	Y	2	Мау		Dr R W L Wong, Statistics and Actuarial Science
STAT2311	Computer-aided data analysis	6	Pass in BIOL1608 or BIOL2608 or ECON1003 or STAT0301 or STAT0302 or STAT1306; and Not for students who have passed in STAT1301, or have already enrolled in this course; and Not for students who have passed in STAT1801, or have already enrolled in this course; and Not for students who have passed in STAT3304, or have already enrolled in this course.	Y	Y	1	Dec		Dr E K F Lam, Statistics and Actuarial Science
STAT2312	Data mining	6	Pass in STAT1302 or STAT1306 or STAT2802 (Any student who has already passed in BIOL1608 or BIOL2608 or ECON1003 or STAT0301 or STAT0302 or STAT1301 or STAT1801 in 2009-10 or before can still apply for the course in 2012- 2013.)	Y	Y	2	No exam	48	Dr G C S Lui, Statistics and Actuarial Science
STAT2313	Marketing engineering	6	Pass in BIOL1608 or BIOL2608 or ECON1003 or STAT0301 or STAT0302 or STAT1301 or STAT1306 or STAT1801	Y	Y	1	Dec		Dr C W Kwan, Statistics and Actuarial Science
STAT2314			Pass in BIOL1608 or BIOL2608 or ECON1003 or STAT0301 or STAT0302 or STAT1306; and Not for students who have passed or already enrolled in any of these courses: STAT1301, STAT1801, STAT2804, STAT3301, ECON0701.		Y				Dr R W L Wong, Statistics and Actuarial Science
STAT2315	Practical mathematics for investment	6	Pass in STAT0301 or STAT0302 or STAT1301 or STAT1306 or STAT1801; and Not for students who have passed in STAT1802, or have already enrolled in this course.	Y	Y	2	Мау		Dr T S T Wong, Statistics and Actuarial Science

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				2012- 2013		0=year long 1=1st sem * 2=2nd sem S=summer				
Departmen	t of Statistics & Actuarial Sc	ience ((	Cont'd)							
STAT2316	Advanced SAS programming	6	Pass in STAT1303	N	Y			96	TBC, Statistics and Actuarial Science	
STAT2317	Sample survey methods	6	Pass or already enrolled in any of the following courses: BIOL1608 or BIOL2608, ECON1003, STAT0301, STAT0302, STAT1301, STAT1306, STAT1801	N	Y				Head of Dept, Statistics and Actuarial Science	
STAT2318	Directed studies in statistics	6	Major in Statistics or Risk Management; and Pass in 18 credits from the following courses: STAT0301, STAT0302, STAT1301, STAT1302, STAT1303, STAT1304, STAT1306, STAT1323, STAT1801, STAT1802; and Not for students who have already enrolled in STAT3319 in this academic year; and Not for students admitted in 2006 or before.	Y	Y	0	No exam	30	Prof S M S Lee, Statistics and Actuarial Science	
STAT2801	Life contingencies	6	(Pass in STAT1302 and STAT2315) or (Pass in STAT1802 and (Pass in STAT2802, or already enrolled in this course)) or (Pass in STAT1302 and STAT1802)	Y	Y	1	Dec		Dr E C K Cheung, Statistics and Actuarial Science	
STAT2802	Statistical models	6	Pass in STAT1801. (For BSc(Actuarial Science) students only)	Y	Y	1	Dec		Dr G Tian, Statistics and Actuarial Science	
STAT2803	Stochastic models	6	For BSc(Actuarial Science) students only; and Pass in STAT1801; and Not for students who have passed in MATH2603, or have already enrolled in this course; and Not for students who have passed in STAT2303, or have already enrolled in this course.	Y	Y	1	Dec		Dr J F Yao, Statistics and Actuarial Science	
STAT2804	Linear models and forecasting	6	(Pass in STAT1302; or Pass in STAT2802, or already enrolled in this course); and For BSc(Actuarial Science) students only; and Not for students who have passed in STAT2301, or have already enrolled in this course; and Not for students who have passed in STAT3301, or have already enrolled in this course; and Not for students who have passed in ECON0701, or have already enrolled in this course.	Y	Y	2	Мау		Prof Y Lam, Statistics and Actuarial Science	
STAT2805	Credibility theory and loss distributions	6	Pass in STAT1302 or STAT2802 or STAT3810	Y	Y	1	Dec		Dr K C Cheung, Statistics and Actuarial Science	
STAT2807	Corporate finance for actuarial science	6	Pass in BUSI1002 and STAT1802; or Pass in STAT2310 and STAT2315.	Y	Y	2	May		Dr J K Woo, Statistics and Actuarial Science	
STAT2812	Financial economics I	6	Pass in STAT1302 or STAT2802; and Not for students who have passed in STAT3303, or have already enrolled in this course; and Not for students who have passed in FINA0301, or have already enrolled in this course.	Y	Y	1	Dec		Prof H L Yang, Statistics and Actuarial Science	

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-	t of Statistics & Actuarial Sc								
STAT2813	Internship in actuarial science	6	Pass in STAT1802 or STAT2801; and For BSc(Actuarial Science) students only	Y	Y	1, 2	No exam		Dr L F K Ng, Statistics and Actuarial Science
STAT2820	Introduction to financial derivatives	6	Pass in STAT1802; and For BSc(Actuarial Science) students only; and Not for students who have passed in STAT3303, or have already enrolled in this course; and Not for students who have already passed in STAT3308 before; and Not for students who have passed in FINA0301, or have already enrolled in this course.	Y	Y	1	Dec		Dr E C K Cheung, Statistics and Actuarial Science
STAT3301	Time-series analysis	6	Pass in STAT2301; and Not for students who have passed in STAT2314, or have already enrolled in this course; and Not for students who have passed in STAT2804, or have already enrolled in this course.	Y	Y	1	Dec		Dr G Li, Statistics and Actuarial Science
STAT3302	Multivariate data analysis	6	Pass in STAT2301 or STAT2804	Y	Y	2	May	60	Prof T W K Fung, Statistics and Actuarial Science
STAT3303	Derivatives and risk management	6	Pass in STAT2315; and Not for BSc(Actuarial Science) students; and Not for students who have passed in STAT2812, or have already enrolled in this course; and Not for students who have passed in STAT2820, or have already enrolled in this course; and Not for students who have passed in FINA0301, or have already enrolled in this course; and Not for students who have already passed in STAT3308 before.	Y	Y	1	Dec		Dr R W L Wong, Statistics and Actuarial Science
STAT3304	Computer-aided statistical modelling	6	Pass in STAT2301 or STAT2804; and Not for students who have passed in STAT2311, or have already enrolled in this course.	Y	Y	2	Мау	60	Dr G Tian, Statistics and Actuarial Science
STAT3306	Selected topics in statistics	6	Pass in STAT2301 or STAT2804. This course is mutually exclusive to STAT6009.	Y	Y	1	Dec		Prof S M S Lee, Statistics and Actuarial Science
STAT3316	Advanced probability	6	Pass in STAT2303 or STAT2803. This course is mutually exclusive to STAT6010.	Y	Y	1	Dec		Prof Y Lam, Statistics and Actuarial Science
STAT3317	Computational statistics	6	Pass in STAT2301. This course is mutually exclusive to STAT6011.	Y	Y	1	Dec		Dr G Tian, Statistics and Actuarial Science
STAT3319	Statistics project	12	Pass in STAT2301; and Not for students who have already enrolled in STAT2318 in this academic year	Y	Y	0	No exam	15	Prof S M S Lee, Statistics and Actuarial Science
STAT3320	Risk management and Basel Accords in banking and finance	6	Pass in STAT2812 or STAT2820 or STAT2808 or STAT3303 or STAT3308 or FINA0301; and Not for students who have already passed in STAT2320 before.	Y	Y	2	Мау		Mr P K Y Pang, Statistics and Actuarial Science
STAT3321	Credit risk analysis	6	Pass in STAT2812 or STAT3303 or STAT3308 or STAT2808 or STAT2820 or FINA0301, or already enrolled in one of these courses.	Y	Y	2	Мау		Mr K P Wat, Statistics and Actuarial Science

Course Code	Title	Credit	Pre-requisite	Availa	able in	Semester offered in 2012-2013	Exam held in 2012-2013	Quota	Course Coordinator
				2012- 2013		0=year long			
Department	of Statistics & Actuarial Sc								
STAT3322	Market risk analysis	6	Pass in ECON1001 or FINA2802 or STAT2309; or Pass in STAT2812 or STAT2806, or already enrolled in either course.	Y	Y	2	Мау		Dr Z Zhang, Statistics and Actuarial Science
STAT3323	Current topics in risk management	6	Pass in STAT3301	N	Y				Head of Dept, Statistics and Actuarial Science
STAT3801	Advanced life contingencies	6	Pass in STAT2801, or already enrolled in this course; and For BSc(Actuarial Science) students only.	Y	Y	2	Мау		Dr L F K Ng, Statistics and Actuarial Science
STAT3802	Advanced contingencies	6	Pass in STAT3801; and For BSc(Actuarial Science) students only.	Y	Y	1	Dec		Prof H L Yang, Statistics and Actuarial Science
STAT3806	Investment and asset management	6	Pass in STAT2801; and For BSc(Actuarial Science) students only; and Not for students who have passed in FINA2802, or have already enrolled in this course.	N	Y				Head of Dept, Statistics and Actuarial Science
STAT3807	507 Fundamentals of actuarial practice		Pass in STAT3801; and For BSc(Actuarial Science) students only.	Y	Y	1	No exam		Dr L F K Ng, Statistics and Actuarial Science
STAT3809	Current topics in actuarial science	6	(Pass in STAT2801, or already enrolled in this course; or Pass in STAT3801, or already enrolled in this course); and For BSc(Actuarial Science) students only.	Y	Y	2	No exam		Prof W K Li, Statistics and Actuarial Science
STAT3810	Risk theory	6	Pass in STAT2803, or already enrolled in this course; or Pass in STAT2303 or MATH2603	Y	Y	2	May		Dr K C Cheung, Statistics and Actuarial Science
STAT3811	Survival analysis	6	Pass in STAT2802, or already enrolled in this course; or Pass in STAT2301 or STAT2801	Y	Y	2	May		Dr E K F Lam, Statistics and Actuarial Science
STAT3819	Project in statistics and actuarial science	6	For BSc(Actuarial Science) students only.	Y	Y	0	No exam		Prof S M S Lee, Statistics and Actuarial Science
STAT3820	Pension Funds and Pension Mathematics	6	Pass in STAT3801; and For BSc(Actuarial Science) students only.	Y	Y	1	Dec		Dr G Ma, Statistics and Actuarial Science
STAT3821	Financial economics II	6	Pass in MATH2603 or STAT2803 or STAT2806 or STAT2812 or STAT3316	Y	Y	2	Мау		Dr E C K Cheung, Statistics and Actuarial Science
STAT3822	Risk Theory II	6	Pass in STAT3810	Y	Y	1	Dec		Dr J K Woo, Statistics and Actuarial Science
STAT3988	Statistics internship	6	Students are expected to have satisfactorily completed their Year 2 study.	Y	Y	1, 2, S	No exam		Dr P L H Yu, Statistics and Actuarial Science
STAT3989	Essential IT skills for statistical and risk analysts	0	Students are expected to have satisfactorily completed their Year 2 study.	Y	Y	S	No exam	48	Dr C W Kwan, Statistics and Actuarial Science
STAT6109	Research methods in statistics	6	Pass in STAT2301 or STAT2804. This course is mutually exclusive to STAT3306.	N	Y				Prof S M S Lee, Statistics and Actuarial Science
STAT6110			Pass in STAT2303 or STAT2803. This course is mutually exclusive to STAT3316.	Ν	Y				Prof Y Lam, Statistics and Actuarial Science
STAT6111	Computational statistics	6	Pass in STAT2301 or STAT2804. This course is mutually exclusive to STAT3317.	N	Y				Dr G Tian, Statistics and Actuarial Science
STAT6114	Advanced statistical modelling     6     Pass in STAT2301     Y     Y     2		2	May		Dr J F Yao, Statistics and Actuarial Science			
STAT6115	Advanced quantitative risk management and finance	6	Pass in STAT3322	Y	Y	2	May		Prof W K Li, Statistics and Actuarial Science

Course Code	Title	Credit	Pre-requisite	Availa	able in	Semester offered in 2012-2013	Exam held in 2012-2013	Quota	Course Coordinator	
				2012- 2013		0=year long 1=1st sem * 2=2nd sem S=summer				
Science Co	mmon Core Courses									
	Science and Technology: Lessons from China	6	NIL	Y	Y	2	Мау	120	Prof L S Chan, Earth Sciences	
CCGL9016	Feeding the World	6	NIL	Y	Y	1	No exam	156	Dr H Corke, Biological Sciences	
CCGL9017	Food: Technology, Trade and Culture	6	NIL	Y	Y	2	Мау	120	Dr H Corke, Biological Sciences	
CCGL9033	Weapons of Mass Destruction: Science, Proliferation and Terrorism	6	NIL	Y	Y	1	No exam	156	Dr K H Lemke, Earth Sciences	
CCST9011	Biotechnology – Science and Impacts	6	NIL	Y	Y	1	No exam	144	Prof F C C Leung, Biological Sciences	
CCST9012	Our Place in the Universe	6	NIL	Y	Y	2	Мау	120	Prof S Kwok, Faculty	
CCST9013	Our Living Environment	6	NIL	Y	Y	2	No exam	120	Dr S C Chang, Earth Sciences	
CCST9014	Science and Music	6	NIL	Y	Y	1	No exam	120	Dr H F Chau, Physics	
CCST9017	Hidden Order in Daily Life: A     6     NIL     Y     Y     1       Athematical Perspective     Image: A     Image: A<		1	No exam	144	Dr T W Ng, Mathematics				
CCST9018	Origin and Evolution of Life	6	NIL	Y	Y	1	No exam	120	Dr S B Pointing, Biological Sciences	
CCST9019	Understanding Climate Change	6	NIL	Y	Y	1	No exam	156	Dr Z H Liu, Earth Sciences	
CCST9021	Hong Kong: Our Marine Heritage	6	NIL	Y	Y	2	No exam	120	Dr 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	Dr H F Chau, Physics	
CCST9023	The Oceans: Science and Society	6	NIL	Y	Y	2	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	144	Prof K S Cheng, Physics	
CCST9028	Critical Thinking About Science and Technology	6	NIL	Y	Y	2	Мау	120	Dr A B Djurišić, Physics	
CCST9030	Forensic Science: Unmasking Evidence, Mysteries and Crimes	6	NIL	Y	Y	2	No exam	120	Prof D L Phillips, Chemistry	
CCST9036	Material World: Past, Present, and Future	aterial World: Past, 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	144	Dr A B Djurišić, Physics	
	Statistics and Our Society	6	NIL	Y	Y	2	May	120	Dr K C Cheung, Statistics and Actuaria Science	
CCST9043	It's All About Time	6	NIL	N	Y				Prof J G Malpas, Earth Sciences	

\* As the 1st semester of 2012-13 will be shortened to cater for the double cohorts of UG freshmen, the teaching and learning activities for 1st semester courses will be adjusted accordingly. Assessment methods and weighting may also be adjusted which would be announced by the teachers at class. Written examination (if any) may be extended beyond the Xmas and the New Year holidays, up to January 5, 2013 if necessary.

## List of Courses for Faculty Electives: Block A, B And C

### SECTION III List of Courses for Faculty Electives: Blocks A, B and C

### A. List of Courses in Blocks A, B and C (for students admitted to the first year in 2009-10)

### Block A - Quantitative Reasoning

Course Code	Credit	Title	Remarks
MATH0201	6	Basic calculus	Bridging course for students with HKCEE Mathematics only
MATH1001	6	Fundamental concepts of mathematics	
MATH1111	6	Linear algebra	
MATH1804	6	University mathematics A	Bridging course for students with AS Mathematics & Statistics only
STAT0301	6	Elementary statistical methods	Bridging course for students with HKCEE Mathematics only Bridging course for students with AS Mathematics & Statistics only
STAT1301	6	Probability and statistics I	
STAT1306	6	Introductory statistics	

### Block B - Physical World

Course Code	Credit	Title	Remarks
CHEM0008	6	Fundamental chemistry	Bridging course for students with HKCEE Chemistry only
CHEM1002	6	Chemistry: principles and concepts	
CHEM1009	6	Basic chemistry	
EASC0105	6	Earth through time	
EASC0118	6	Blue planet	
ENVS0001	6	Introduction to environmental science	
PHYS0001	3	Nature of the universe I: introduction to observational astronomy and the solar system	(Course obsoleted)
PHYS0002	3	Nature of the universe II: stars, galaxies and cosmology for beginners	(Course obsoleted)
PHYS0003	6	Nature of the universe	
PHYS0625	6	Physics by inquiry	Bridging course for students with HKCEE Physics only
PHYS1414	6	General physics I	
PHYS1417	6	Basic physics	

Course Code	Credit	Title	Remarks
BIOC1003	6	Introduction to molecular genetics	
BIOL0002	3	Introduction to food and nutritional science	(Course obsoleted)
BIOL0126	6	Fundamentals of biology	Bridging course for students with HKCEE Biology only
BIOL0129	3	Introductory microbiology	(Course obsoleted)
BIOL0135	6	Introductory microbiology	
BIOL0625	6	Ecology and evolution	
BIOL1122	6	Functional biology	
BIOL1125	6	Introduction to biochemistry	
ENVS1002	6	Environmental life science	

### B. List of Courses in Blocks A, B and C (for students admitted to the first year in 2010-11)

Course Code	Credit	Title	Remarks
MATH0201	6	Basic calculus	Bridging course for students with HKCEE Mathematics only
MATH1001	6	Fundamental concepts of mathematics	
MATH1111	6	Linear algebra	
MATH1804	6	University mathematics A	Bridging course for students with AS Mathematics & Statistics only
STAT0301	6	Elementary statistical methods	Bridging course for students with HKCEE Mathematics only Bridging course for students with AS Mathematics & Statistics only
STAT1301	6	Probability and statistics I	
STAT1306	6	Introductory statistics	

### Block A - Quantitative Reasoning

### Block B - Physical World

DIOCK D - FIIJ			
Course Code	Credit	Title	Remarks
CHEM0008	6	Fundamental chemistry	Bridging course for students with HKCEE Chemistry only
CHEM1002	6	Chemistry: principles and concepts	
CHEM1009	6	Basic chemistry	
EASC0105	6	Earth through time	
EASC0118	6	Blue planet	
ENVS0001	6	Introduction to environmental science	
PHYS0001	3	Nature of the universe I: introduction to observational astronomy and the solar system	(Course obsoleted)
PHYS0002	3	Nature of the universe II: stars, galaxies and cosmology for beginners	(Course obsoleted)
PHYS0003	6	Nature of the universe	
PHYS0625	6	Physics by inquiry	Bridging course for students with HKCEE Physics only
PHYS1414	6	General physics I	
PHYS1417	6	Basic physics	

Course Code	Credit	Title	Remarks
BIOC1003	6	Introduction to molecular genetics	
BIOL0126	6	Fundamentals of biology	Bridging course for students with HKCEE Biology only
BIOL0625	6	Ecology and evolution	
BIOL1122	6	Functional biology	
BIOL1125	6	Introduction to biochemistry	
ENVS1002	6	Environmental life science	

### C. List of Courses in Blocks A, B and C (for students admitted to the first year in 2011-12)

Course	Credit	Title	Remarks
MATH0201	6	Basic calculus	Bridging course for students with HKCEE Mathematics only
MATH1001	6	Fundamental concepts of mathematics	
MATH1111	6	Linear algebra	
MATH1804	6	University mathematics A	Bridging course for students with AS Mathematics & Statistics only
STAT0301	6	Elementary statistical methods	Bridging course for students with HKCEE Mathematics only Bridging course for students with AS Mathematics & Statistics only
STAT1301	6	Probability and statistics I	
STAT1306	6	Introductory statistics	

### Block A - Quantitative Reasoning

#### Block B - Physical World

Block B Thysical Hena					
Course	Credit	Title	Remarks		
CHEM0008	6	Fundamental chemistry	Bridging course for students with HKCEE Chemistry only		
CHEM1002	6	Chemistry: principles and concepts			
CHEM1009	6	Basic chemistry			
EASC0105	6	Earth through time			
EASC0118	6	Blue planet			
ENVS0001	6	Introduction to environmental science			
PHYS0001	3	Nature of the universe I: introduction to observational astronomy and the solar system	(Course obsoleted)		
PHYS0002	3	Nature of the universe II: stars, galaxies and cosmology for beginners	(Course obsoleted)		
PHYS0003	6	Nature of the universe			
PHYS0625	6	Physics by inquiry	Bridging course for students with HKCEE Physics only		
PHYS1414	6	General physics I			
PHYS1417	6	Basic physics			

Course	Credit	Title	Remarks
BIOC1003	6	Introduction to molecular genetics	
BIOL0126	6	Fundamentals of biology	Bridging course for students with HKCEE Biology only
BIOL0625	6	Ecology and evolution	
BIOL1122	6	Functional biology	
BIOL1125	6	Introduction to biochemistry	
ENVS1002	6	Environmental life science	

### D. List of Courses in Blocks A, B and C (for students admitted to the first year in 2012-13)

Course Code	Credit	Title	Remarks
MATH0201	6	Basic calculus	Bridging course for students with HKCEE Mathematics only
MATH1001	6	Fundamental concepts of mathematics	
MATH1111	6	Linear algebra	
MATH1804	6	University mathematics A	Bridging course for students with AS Mathematics & Statistics only
STAT0301	6	Elementary statistical methods	Bridging course for students with HKCEE Mathematics only Bridging course for students with AS Mathematics & Statistics only
STAT1301	6	Probability and statistics I	
STAT1306	6	Introductory statistics	

### Block A - Quantitative Reasoning

### Block B - Physical World

Block B Thysical Wond			
Course Code	Credit	Title	Remarks
CHEM0008	6	Fundamental chemistry	Bridging course for students with HKCEE
			Chemistry only
CHEM1002	6	Chemistry: principles and concepts	
CHEM1009	6	Basic chemistry	
EASC0105	6	Earth through time	
EASC0118	6	Blue planet	
ENVS0001	6	Introduction to environmental science	
PHYS0003	6	Nature of the universe	
PHYS0625	6	Physics by inquiry	Bridging course for students with HKCEE Physics only
PHYS1414	6	General physics I	
PHYS1417	6	Basic physics	

Block of Elite & Eliting			
Course Code	Credit	Title	Remarks
BIOC1003	6	Introduction to molecular genetics	
BIOL0126	6	Fundamentals of biology	Bridging course for students with HKCEE Biology only
BIOL0625	6	Ecology and evolution	
BIOL1122	6	Functional biology	
BIOL1125	6	Introduction to biochemistry	
ENVS1002	6	Environmental life science	

### **Experiential Learning for** Science Students

# SCIENCE

#### SECTION IV Experiential Learning for Science Students

「不聞不若聞之,聞之不若見之,見之不若知之,知之不若行之,學至於行而止矣。」

- 荀子《儒效篇》

"Not having heard is not as good as having heard, having heard is not as good as having seen, having seen is not as good as mentally knowing, mentally knowing is not as good as putting into action; true learning is complete only when action has been put forth."

- Xunzi (ca 313-238 BC), Confucian Devotional Writing

#### 1. Background

In order to provide students with an integrated and holistic education, the Faculty of Science has included an element of Experiential Learning (EL) within the new BSc curriculum, for which all students admitted in or after 2007 must engage in at least one form of EL activities for graduation.

At present, most of the teaching and learning in our curriculum is implemented through a classroom setting. Although lecture- and classroom-based learning has its rightful place in the university curriculum because of its high efficiency in delivering static information and knowledge, its limitations are also obvious. For example, it does not provide a nurturing environment to foster independent learning, and lacks flexibility to allow students to attempt specific topics that cater to their individual interest and ability. It also tends to shield students from the outside world, and fails to facilitate meaningful practices for students to apply what they have learned to real situations. Besides, pedagogy in a traditional classroom setting is difficult to encourage students taking initiative and a more active role in their own learning. In these regards, a multitude of various educational activities need to be introduced to address these limitations. EL activities are such educational activities that can complement and enhance the curriculum so as to give students an all-rounded and whole-person education.

We classify EL activities into the following five categories:

- 1. Project-based learning
- 2. Field Studies
- 3. Internship and Professional Preparation Programme
- 4. Exchange studies
- 5. Other form of EL

By participating in different kinds of EL activities, students are expected:

- to gain working experience in a real-world workplace environment
- to have diverse learning experience
- to integrate theory and practice, and to understand limitations of their current knowledge
- to engage in research in their majored science discipline
- to prepare for their life-long career
- to broaden their social and cultural experience, and to develop their social and cultural values
- to work in a team and to collaborate with people with diverse background

These learning objectives fit well within the framework of the future 4-Year Undergraduate Curriculum of the University, in which "diverse learning experiences," "multiple forms of learning and assessment," "multidisciplinary collaboration," "engagement with local and global communities," and "development of civic and moral values" have been identified as five of the seven distinctive features (the remaining two features are "(inter)disciplinary inquiry" and "polycontextual inquiry") of the new curriculum. [Transforming Student Learning: 4-Year Undergraduate Curriculum Reform (Discussion Document), Steering Committee, HKU, May 2006] Obviously, it is unrealistic to expect any single EL activity to embrace *all* the aforementioned learning objectives. On the other hand, students are not restricted from taking more than one EL activity, and they have options to choose EL activities that suit their individual circumstances and educational needs.

#### 2. Formats and Requirements

EL is a mandatory component in the BSc curriculum and all students must pass this requirement for his/her primary major for graduation. The workload of EL is equivalent to at least a 6-credit advanced level course. Some of the EL activities are credit bearing and some are not. In a circumstance that the EL activities are non-credit bearing, students have to take a 6-credit advanced level course in their primary major to complete the credit requirements. For the second major, it is not required for the student to take EL but a 6-credit advanced level course in the second major must be taken to fulfill the credit requirement.

EL activities vary in nature and length of time. EL activities, once being successfully completed, will be listed in the transcript. At present the Faculty does not restrict a student from taking more than one EL activity. The following is a list of EL activities and the requirements currently recognized by the Faculty. More EL courses and activities may be added to the list in future.

#### Category 1: Project-based Learning

Project-based learning allows students to have an in-depth study of a specific topic, which is often not fully covered in regular courses, through individual and independent research. On one hand, students taking project-based EL activities will receive more attention from their supervising teachers when compared with those in regular courses, on the other hand these students will need to take more initiative and be more self-reliant in order to perform well in their learning. Free from a rigid syllabus, project-based learning often allows greater student participation in formulating the framework, contents and goals of the learning according to the student's individual interest and ability. In this respect, project-based learning is a truly personalized learning experience. It also provides perfect opportunities for students to test out and to realize their potential in conducting scientific research or pursuing further study in related disciplines. As students will normally need to integrate knowledge they have acquired throughout the curriculum and apply in a non-trivial manner on the project, project-based learning is also a valuable capstone experience. Thesis and Report writing and oral presentations are essential elements of project-based learning, as they will enable students to learn how to present complex information, to express difficult ideas and to communicate them effectively to others.

1. Final Year Project

Students who have taken adequate advanced-level core courses in their science major may take a Final Year Project to engage in an in-depth study or research on a specific topic under the supervision of a staff member. As the work involved in these projects demands a high level of academic well-preparedness and intellectual maturity of the student, usually only final year students with good academic standing are allowed to enroll. Workload of these 12-credit projects are also expected to be substantial. These projects, which usually contain an element of originality, will give students an early experience of conducting serious scientific research.

Credit	:	12 credits
Requirements	:	Substantial work expected and requires a presentation and submission of a written final report.
Courses offered	:	BIOC3614, BIOL3321, CHEM3105, EASC3308, ENVS3015, MATH3999, PHYS3531,
		STAT3319

2. Directed Studies

Students choosing this form of EL will undertake a self-managed study under the supervision of a staff member. The directed study can be a critical review or a synthesis of published work on the subject, or a small scale project on a specific topic of the subject, or a laboratory or field study that would enhance the student's understanding of the subject.

Credit	:	6 credits
Requirement	:	Requires a presentation and submission of a written final report.
Courses offered	:	BIOC2616, BIOL2320, CHEM2111, EASC2307, ENVS2011, MATH2999, PHYS2533,
		STAT2318

#### 3. Seminar Course

Students taking a seminar course are required to undertake private study of material, usually research articles or books that are designated by the teacher. They are required also to take turns to give presentations in class meetings, and to participate in discussions during such meetings. Student will learn in a highly active and interactive manner the topics that are covered by the material they study. They will also be able to acquire many core learning skills such as literature searching and reviewing, self-managed study on the subject, synthesizing and presenting the material they have studied, and analyzing and critiquing the material and views presented by their fellow students.

Credit	:	6 credits
Requirement	:	Requires class presentations, participation in class discussions, and submission of a written
		final report. Some seminar courses may also require a final examination.
Course offered	:	MATH2002

#### 4. HKUtopia: Capstone Experience for Chemistry Undergraduates

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.

Credit	:	6 credits
Requirements	:	Students are expected to have satisfactorily completed all introductory chemistry core courses
		and at least four advanced chemistry core courses. Students who are interested in taking the
		course should contact the Department for application.
Course offered	:	CHEM3901

5. Summer Research Fellowship (SRF)

A limited number of fellowships (about 20 each year) are available for first and second year students for in-Faculty research in the summer. Students awarded with SRF are expected to work in the Faculty on a specific research project for at least 8 weeks during the summer. Successful applicants will be awarded with a stipend for their summer research work. Students have to approach prospective supervisors for research opportunities and recommendations. Upon completion of the research, students are required to submit a report of their research work and give a presentation at a research colloquium organized by the Faculty.

Credit: Non-credit bearingRequirements: Requires submission of a written final report and presentation at a research colloquium<br/>organized by the Faculty.

6. Overseas Research Fellowship (ORF)

A limited number of fellowships are available to first and second year students for overseas research opportunities in the summer. Students awarded with ORF are expected to conduct research projects under supervision by faculty members of overseas universities or institutions for at least 8 weeks during summer. Successful applicants will be awarded with a stipend. Students have to approach prospective supervisors for research opportunities and recommendations. Upon completion of the research, students are required to submit a report of their research work and give a presentation at a research colloquium organized by the Faculty.

Credit : Non-credit bearing

Requirements : Requires submission of a written final report and presentation at a research colloquium organized by the Faculty.

#### Category 2: Field Studies

Field studies provide students with first-hand, on-site learning which is not possible inside a classroom or a laboratory. In addition, students are often required to perform a number of tasks so as to acquire skills that are essential in their studied discipline.

7. Field Course

Credit	:	6 credits
Requirements	:	12 days or more in the field. Field course must be part of the curriculum and with formal
		assessment.
Courses offered	1 :	BIOL2318, EASC2301

8. Environmental science in practice

To provide students experiential learning experience in the field of environmental science. The course is primarily based on an array of relevant field studies covering the four essential areas of the major. Invited guest lectures delivered by environmental practitioners may be held. Students are expected to recognize ways of environmental science in practice, gain knowledge of current environmental problems and solutions, and be able to present and communicate their field observations and findings.

Credit	:	6 credits
Requirement	:	Students will take part in at least 48 hours of field trips (about 8 trips) and 18 hours of guided
		discussions and invited guest lectures (6 sessions). Some trips will be organized in the reading weeks, and others in weekends.
Course offered	:	ENVS3016

#### Category 3: Internship and Professional Preparation Programme

EL activities under this category either help students to gain meaningful working experience or to prepare them for their future career.

9. Discipline Internship

The discipline specific internship course aims to offer students the opportunities to gain work experience in the industry related to their major of study. Students have to take on at least 160 hours of internship work either within the University or outside the University arranged by the School/Department. Upon completion of the internship, students must submit a written report and give a presentation.

Credit	:	6 credits (with Pass/Fail grade)
Requirement	:	At least 160 hours of internship work either within the University or outside the University
		arranged by the School/Department. Upon completion of the internship, students must submit a
		written report and give a presentation.
Courses offered	:	BIOC3988, BIOL3988, CHEM3988, EASC3988, ENVS3988, MATH3988, PHYS3988,
		STAT3988

#### 10. Service Learning Internship

The course aims to offer students the opportunities to learn through active participation in organized service activities and to help develop their social consciousness and commitment so as to become a responsible citizen. Though it may not be related to their major of study, it would be of great benefits to students to apply their knowledge and scientific mind acquired in their study to provide meaningful services to society. It also aims to achieve some educational aims of the University, such as leadership and advocacy for the improvement of human condition and tackling novel situations. Students have to take on at least 120 hours of internship work either within the University or outside the University arranged by the Faculty.

Credit Requirement		Non-credit bearing (with Pass/Fail grade) At least 120 hours of internship work either within the University or outside the University arranged by the Faculty.
Remarks	:	<ul><li>(i) The course is for Year 2 / Year 3 students only.</li><li>(ii) Enrollment priority will be given to those students who have not taken any EL activities.</li></ul>
Course offered	:	SCNC2988

11. Career Development for Science Students

The Career Development for Science Students course is jointly offered by the Faculty of Science and the Centre of Development and Resources for Students (CEDARS). It comprises modules on Readiness, Career Exposure, Skillbased training, Communication and adjustment in workplace. The course is designed to enhance students' personal and career preparation skills through a variety of activities including seminars, practical workshops, small group discussions, role play, and company visits. It aims to facilitate students in making informed career choices, provide training to enhance communication, presentation, time management skills, and enhance the students' employability.

Credit	:	Non-credit bearing (with Pass/Fail grade)
Requirements	:	Class attendance and course work
Remarks	:	(i)The course is for Year 2 / Year 3 students only.
		(ii) Enrollment priority will be given to those students who have not taken any EL activities.
Course offered	:	SCNC2005

12. Essential IT Skills for Statistical and Risk Analysts

Essential IT Skills for Statistical and Risk Analysts course is offered to students majoring in Statistics or Risk Management. It aims to enhance students' IT knowledge and skills which are not covered in the current curriculum but are essential for career development of statistical and risk analysts. The course may contain a variety of activities including computer hand-on workshops on VBA programming, MS-office and SPSS, group projects, and company visits.

Credit	:	Non-credit bearing (with Pass/Fail grade)
Requirement	:	At least 120 hours of experiential learning activities. The course is a four-week course
		consisting of 60 hours of demonstration and hand-on exercises of the computer software
		conducted in a computer laboratory, and 60 hours for a group project and some firm visits.
Remarks	:	(i) The course is for Year 2 / Year 3 BSc Risk Management and Statistics major students only.
		(ii) Enrollment priority will be given to those students who have not taken any EL activities.
Course offered	:	STAT3989

#### 13. Quantitative tools in physics

Quantitative tools in physics course is offered to students majoring in Astronomy; Mathematics/Physics or Physics. It aims to enable students to use a few quantitative software packages that are commonly used in physics computation, experiment and presentation through mainly hands on projects. Since these software packages are generally used by researchers in both academic and industrial institutions, successful completion of this pass/fail course allows students to better prepare themselves to a physics and astronomy research career, in particular, those works that involve heavy computational and/or experimental elements.

Credit	:	Non-credit bearing (with Pass/Fail grade)
Requirement	:	The course consists of 4 hours of lectures, 10 hours of tutorials, 60 hours of hands on
		experience and self study, and 60 hours of project work.
Course offered	:	PHYS3987

#### Category 4: Exchange Study

Exchange study in overseas universities provides students with rich learning experience in a different educational, social and cultural environment. It will help students broaden their exposure, extend their horizon, and develop a global perspective.

14. Exchange Study

Credit	:	Non-credit bearing
Requirements	:	At least 1 semester (1 <sup>st</sup> or 2 <sup>nd</sup> semester), the exchange study must be through the HKU
		Worldwide Exchange Programme or Science Faculty/Department Level Exchange Programmes.

#### Category 5: Other Form of Experiential Learning

To offer more options of EL to students, some suitable activities and courses other than those in the previous categories will be considered and determined by the Faculty as qualified EL activities. At present the Intensified Learning Opportunity Programme is one such qualified EL activity. More qualified EL activities may be introduced in the future.

#### 15. Intensified Learning Opportunity Programme (ILOP)

This 14 month programme is offered by CEDARS to produce graduates of distinction committed to lifelong learning, integrity and professionalism, capable of being responsive leaders and communicators in their fields. The programme is mainly for second year students. Application is usually in October each year. It provides training in personal development, global citizenship, social equality and advocacy, and cultural awareness. It also includes an overseas internship and a mentorship scheme.

Credit : Non-credit bearing

Requirements : Students who are selected and have successfully completed the programme are deemed to have satisfied the EL requirement.

#### 3. <u>Summary of Experiential Learning Activities for Each Major</u>

The following list of courses and activities are currently recognized as EL courses and activities.

Major		Recognized EL Activities		
1.	Biochemistry	- BIOC2616	Directed studies in biochemistry (6)	
		- BIOC3614	Biochemistry project (12)	
		- BIOC3988	Biochemistry internship (6)	
2.	Biology	- BIOL2318	Biological Sciences Field Course (6)	
3.	Biotechnology	- BIOL2320	Directed studies in biological sciences (6)	
4.	Ecology & Biodiversity	- BIOL3321	Biological sciences project (12)	
5.	Food & Nutritional Science	- BIOL3988	Biological sciences internship (6)	
6.	Microbiology			
7.	Chemistry	- CHEM2111	Directed studies in chemistry (6)	
		- CHEM3105	Chemistry project (12)	
		- CHEM3901	HKUtopia: Capstone Experience for Chemistry Undergraduates (6)	
		- CHEM3988	Chemistry internship (6)	
8.	Earth Sciences	- EASC2301	Field camps (6)	
		- EASC2307	Directed studies in earth sciences (6)	
		- EASC3308	Earth sciences project (12)	
		- EASC3988	Earth sciences internship (6)	
9.	Environmental Science	- ENVS2011	Directed studies in environmental science (6)	
		- ENVS3015	Environmental science project (12)	
		- ENVS3016	Environmental science in practice (6)	
			L courses is also available as elective:	
		- ENVS3988	Environmental science internship (6)	
10.	Mathematics	- MATH2002	Mathematics seminar (6)	
		- MATH2999	Directed studies in mathematics (6)	
		- MATH3988	Mathematics internship (6)	
		- MATH3999	Mathematics project (12)	
11.	Mathematics / Physics	- MATH2002	Mathematics seminar (6)	
	-	- MATH2999	Directed studies in mathematics (6)	
		- MATH3988	Mathematics internship (6)	
		- MATH3999	Mathematics project (12)	
		- PHYS2533	Directed studies in physics (6)	
		- PHYS3531	Physics project (12)	
		- PHYS3987	Quantitative tools in physics (0)	
		- PHYS3988	Physics internship (6)	
12.	Astronomy	- PHYS2533	Directed studies in physics (6)	
13.	Physics	- PHYS3531	Physics project (12)	
		- PHYS3987	Quantitative tools in physics (0)	
		- PHYS3988	Physics internship (6)	
14.	Risk Management	- STAT2318	Directed studies in statistics (6)	
15.	Statistics	- STAT3319	Statistics project (12)	
		- STAT3988	Statistics internship (6)	
		- STAT3989	Essential IT skills for statistical and risk analysts (0)	
Exp	eriential Learning Courses /	Exchange Study		
	vities		mester (1 <sup>st</sup> or 2 <sup>nd</sup> semester) exchange via the HKU Worldwide	
C	nmon to all Majors	Exchange Pro (non-credit be	gramme or Science Faculty/Department Level Exchange Programmes aring)	
Con				
Con		Research-based	Learning	
Con		Research-based		
Con		- Summer Rese	<u>Learning</u> arch Fellowship (organized at Faculty level) (non-credit bearing) earch Fellowship (organized at Faculty level) (non-credit bearing)	
Con		<ul><li>Summer Rese</li><li>Overseas Rese</li></ul>	arch Fellowship (organized at Faculty level) (non-credit bearing) earch Fellowship (organized at Faculty level) (non-credit bearing)	
Con		Summer Rese     Overseas Rese <u>Professional Pre</u>	arch Fellowship (organized at Faculty level) (non-credit bearing) earch Fellowship (organized at Faculty level) (non-credit bearing) paration Programme	
Con		Summer Rese     Overseas Rese <u>Professional Pre</u> SCNC2005 C	arch Fellowship (organized at Faculty level) (non-credit bearing) earch Fellowship (organized at Faculty level) (non-credit bearing) paration Programme areer development for science students (non-credit bearing)	
Con		Summer Rese     Overseas Rese <u>Professional Pre</u> SCNC2005 C     SCNC2988 Se	arch Fellowship (organized at Faculty level) (non-credit bearing) earch Fellowship (organized at Faculty level) (non-credit bearing) paration Programme	

# SECTIONV

## Science Majors on offer in 2012/13

# SCIENCE

#### SECTION V Science Majors on offer in 2012/13

#### Majors offered by Science Faculty

#### <u>Majors</u> (15)

Astronomy Biochemistry Biology Biotechnology Chemistry Earth Sciences Ecology & Biodiversity Environmental Science Food & Nutritional Science Mathematics Mathematics/Physics Microbiology Physics Risk Management Statistics

Major Title	Major in Astronomy
Offered to students admitted to Year 1 in	2012-2013

The 21st century is the golden age for astronomy as space-based telescopes are beginning 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 interest specialization in the subject, including observational astronomy, planetary science, stellar physics, and interstellar medium. Students would 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 also 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:

a. Students should be able to identify and describe astrophysical phenomena with their professional knowledge. (By means of coursework and tutorial classes in the curriculum)

b. Students should 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)

c. Students should be able to analyze astrophysical problems gualitatively and guantitatively. (By means of coursework, tutorial classes and research-based projects in the curriculum)

d. Students should be able to communicate and collaborate with people effectively in scientific issues. (By means of group projects, tutorial sessions and presentation opportunities in the curriculum)

e. Students should be able to apply scientific and quantitative methods in tackling problems in research or realworld setting.

(By means of projects, directed studies, local and foreign internships attached to universities, research centers, government bodies, NGOs and influential companies.)

#### **Minimum Entry Requirement:**

AL / AS Physics or AL Engineering Science; and HKCEE Additional Mathematics or AS Mathematics and Statistics or AL Pure Mathematics; or a pass in PHYS0625 Physics by inquiry or equivalent

#### Minimum Credit Requirement:

72 credits (18 credits introductory level, 54 credits advanced level courses including experiential learning requirement)

#### Impermissible Combination:

Minor in Astronomy

#### Required courses (72 credits) (note 1)

#### 1. Introductory level courses (18 credits)

EASC1123 Planetary geology 6 PHYS0003 Nature of the universe 6

Plus at least 6 credits of the following courses:

PHYS1414 General physics I 6 PHYS1415 General physics II 6 PHYS1417 Basic physics 6

#### 2. Advanced level courses (48 credits)

PHYS2021 The Physical universe 6 PHYS2022 Observational astronomy 6 PHYS2627 Introductory quantum physics (note 2) 6

Plus at least 12 credits of the following courses, subject to prerequisite requirements.

MATH2601 Numerical analysis 6

PHYS2222 Wave and optics 6 PHYS2227 Laser & spectroscopy 6 PHYS2321 Introductory electromagnetism 6 PHYS2322 Statistical mechanics and thermodynamics 6 PHYS2323 Introductory quantum mechanics 6 PHYS2325 Theoretical physics 6 PHYS2626 Introductory classical mechanics 6

Plus at least 12 credits of the following courses, subject to prerequisite requirements.

PHYS2039 Principles of astronomy 6 PHYS3031 Astrophysics 6 PHYS3033 General relativity 6 PHYS3034 Cosmology 6 PHYS3035 Stellar atmospheres 6 PHYS3036 Interstellar medium 6 PHYS3037 Selected topics in astrophysics 6 PHYS3038 Planetary science 6 PHYS3040 Stellar physics 6

Plus at least 6 credits of advanced level Physics courses (PHYS2XXX or PHYS3XXX or PHYS6XXX level), subject to prerequisite requirements.

#### 3. Experiential learning requirement (6 credits) \*

Students must take at least one of the following forms of extra-learning experience to fulfill the experiential learning requirement:

- PHYS2533 Directed studies in physics 6

- PHYS3531 Physics project 12
- PHYS3987 Quantitative tools in physics (non-credit bearing)
- PHYS3988 Physics internship 6
- SCNC2005 Career development for science students (non-credit bearing)
- SCNC2988 Service learning internship (non-credit bearing)

- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)

- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (noncredit bearing)

\* If the extra-learning experience is fulfilled by non-credit bearing activities, students must take an additional 6credit advanced level physics course (PHYS2XXX or PHYS3XXX or PHYS6XXX level).

Students are not required to take EL if this Science major is taken as a second major but a 6-credit advanced level course in the second major must be taken to fulfill the credit requirement.

#### Notes:

1 For students having major-major, or major-minor combinations of Astronomy-Physics, a major-major combination of Astronomy-Mathematics/Physics, a set of replacement courses from the Departments of Mathematics and Physics will be made available so that there will be no overlap with the core courses in this major. 2 Students may consider taking PHYS2627 as early as possible to allow for maximum flexibility in course selection for advanced level courses.

#### **Remarks:**

Major Title	Major in Astronomy
Offered to students admitted to Year 1 in	2011-2012

The 21st century is the golden age for astronomy as space-based telescopes are beginning 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 interest specialization in the subject, including observational astronomy, planetary science, stellar physics, and interstellar medium. Students would 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 also 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:

a. Students should be able to identify and describe astrophysical phenomena with their professional knowledge. (By means of coursework and tutorial classes in the curriculum)

b. Students should 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)

c. Students should be able to analyze astrophysical problems gualitatively and guantitatively. (By means of coursework, tutorial classes and research-based projects in the curriculum)

d. Students should be able to communicate and collaborate with people effectively in scientific issues. (By means of group projects, tutorial sessions and presentation opportunities in the curriculum)

e. Students should be able to apply scientific and quantitative methods in tackling problems in research or realworld setting.

(By means of projects, directed studies, local and foreign internships attached to universities, research centers, government bodies, NGOs and influential companies.)

#### **Minimum Entry Requirement:**

AL / AS Physics or AL Engineering Science; and HKCEE Additional Mathematics or AS Mathematics and Statistics or AL Pure Mathematics; or a pass in PHYS0625 Physics by inquiry or equivalent

#### Minimum Credit Requirement:

72 credits (18 credits introductory level, 54 credits advanced level courses including experiential learning requirement)

#### Impermissible Combination:

Minor in Astronomy

#### Required courses (72 credits) (note 1)

#### 1. Introductory level courses (18 credits)

EASC1123 Planetary geology 6

#### Either

[PHYS0001 Nature of the universe I: introduction to observational astronomy and the solar system (note 3) (3) AND

PHYS0002 Nature of the universe II: stars, galaxies and cosmology for beginners (note 3) (3) ] OR PHYS0003 Nature of the universe 6

Plus at least 6 credits of the following courses:

PHYS1414 General physics I 6 PHYS1415 General physics II 6 PHYS1417 Basic physics 6

#### 2. Advanced level courses (48 credits)

PHYS2021 The Physical universe 6 PHYS2022 Observational astronomy 6 PHYS2627 Introductory quantum physics (note 2) 6

Plus at least 12 credits of the following courses, subject to prerequisite requirements.

MATH2601 Numerical analysis 6 PHYS2222 Wave and optics 6 PHYS2227 Laser & spectroscopy 6 PHYS2321 Introductory electromagnetism 6 PHYS2322 Statistical mechanics and thermodynamics 6 PHYS2323 Introductory quantum mechanics 6 PHYS2325 Theoretical physics 6 PHYS2626 Introductory classical mechanics 6

Plus at least 12 credits of the following courses, subject to prerequisite requirements.

PHYS2039 Principles of astronomy 6 PHYS3031 Astrophysics 6 PHYS3033 General relativity 6 PHYS3034 Cosmology 6 PHYS3035 Stellar atmospheres 6 PHYS3036 Interstellar medium 6 PHYS3037 Selected topics in astrophysics 6 PHYS3038 Planetary science 6 PHYS3040 Stellar physics 6

Plus at least 6 credits of advanced level Physics courses (PHYS2XXX or PHYS3XXX or PHYS6XXX level), subject to prerequisite requirements.

#### 3. Experiential learning requirement (6 credits) \*

Students must take at least one of the following forms of extra-learning experience to fulfill the experiential learning requirement:

- PHYS2533 Directed studies in physics 6

- PHYS3531 Physics project 12

- PHYS3987 Quantitative tools in physics (non-credit bearing)
- PHYS3988 Physics internship 6
- SCNC2005 Career development for science students (non-credit bearing)
- SCNC2988 Service learning internship (non-credit bearing)

- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)

- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (noncredit bearing)

\* If the extra-learning experience is fulfilled by non-credit bearing activities, students must take an additional 6credit advanced level physics course (PHYS2XXX or PHYS3XXX or PHYS6XXX level). Students are not required to take EL if this Science major is taken as a second major but a 6-credit advanced

level course in the second major must be taken to fulfill the credit requirement.

#### Notes:

1 For students having major-major, or major-minor combinations of Astronomy-Physics, a major-major combination of Astronomy-Mathematics/Physics, a set of replacement courses from the Departments of Mathematics and Physics will be made available so that there will be no overlap with the core courses in this major. 2 Students may consider taking PHYS2627 as early as possible to allow for maximum flexibility in course selection for advanced level courses.

3 Not available in 2012-2013 or thereafter.

#### **Remarks:**

Major Title	Major in Astronomy
Offered to students admitted to Year 1 in	2010-2011

The 21st century is the golden age for astronomy as space-based telescopes are beginning 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 interest specialization in the subject, including observational astronomy, planetary science, stellar physics, and interstellar medium. Students would 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 also 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:

a. Students should be able to identify and describe astrophysical phenomena with their professional knowledge. (By means of coursework and tutorial classes in the curriculum)

b. Students should 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)

c. Students should be able to analyze astrophysical problems gualitatively and guantitatively. (By means of coursework, tutorial classes and research-based projects in the curriculum)

d. Students should be able to communicate and collaborate with people effectively in scientific issues. (By means of group projects, tutorial sessions and presentation opportunities in the curriculum)

e. Students should be able to apply scientific and quantitative methods in tackling problems in research or realworld setting.

(By means of projects, directed studies, local and foreign internships attached to universities, research centers, government bodies, NGOs and influential companies.)

#### **Minimum Entry Requirement:**

AL / AS Physics or AL Engineering Science; and HKCEE Additional Mathematics or AS Mathematics and Statistics or AL Pure Mathematics; or a pass in PHYS0625 Physics by inquiry or equivalent

#### Minimum Credit Requirement:

72 credits (18 credits introductory level, 54 credits advanced level courses including experiential learning requirement)

#### Impermissible Combination:

Minor in Astronomy

#### Required courses (72 credits) (note 1)

#### 1. Introductory level courses (18 credits)

EASC1123 Planetary geology 6

#### Either

[PHYS0001 Nature of the universe I: introduction to observational astronomy and the solar system (note 3) (3) AND

PHYS0002 Nature of the universe II: stars, galaxies and cosmology for beginners (note 3) (3) ] OR PHYS0003 Nature of the universe 6

Plus at least 6 credits of the following courses:

PHYS1414 General physics I 6 PHYS1415 General physics II 6 PHYS1417 Basic physics 6

#### 2. Advanced level courses (48 credits)

PHYS2021 The Physical universe 6 PHYS2022 Observational astronomy 6 PHYS2627 Introductory quantum physics (note 2) 6

Plus at least 12 credits of the following courses, subject to prerequisite requirements.

MATH2601 Numerical analysis 6 PHYS2222 Wave and optics 6 PHYS2227 Laser & spectroscopy 6 PHYS2321 Introductory electromagnetism 6 PHYS2322 Statistical mechanics and thermodynamics 6 PHYS2323 Introductory quantum mechanics 6 PHYS2325 Theoretical physics 6 PHYS2626 Introductory classical mechanics 6

Plus at least 12 credits of the following courses, subject to prerequisite requirements.

PHYS2039 Principles of astronomy 6 PHYS3031 Astrophysics 6 PHYS3033 General relativity 6 PHYS3034 Cosmology 6 PHYS3035 Stellar atmospheres 6 PHYS3036 Interstellar medium 6 PHYS3037 Selected topics in astrophysics 6 PHYS3038 Planetary science 6 PHYS3040 Stellar physics 6

Plus at least 6 credits of advanced level Physics courses (PHYS2XXX or PHYS3XXX or PHYS6XXX level), subject to prerequisite requirements.

#### 3. Experiential learning requirement (6 credits) \*

Students must take at least one of the following forms of extra-learning experience to fulfill the experiential learning requirement:

- PHYS2533 Directed studies in physics 6

- PHYS3531 Physics project 12

- PHYS3987 Quantitative tools in physics (non-credit bearing)
- PHYS3988 Physics internship 6
- SCNC2005 Career development for science students (non-credit bearing)
- SCNC2988 Service learning internship (non-credit bearing)

- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)

- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (noncredit bearing)

\* If the extra-learning experience is fulfilled by non-credit bearing activities, students must take an additional 6credit advanced level physics course (PHYS2XXX or PHYS3XXX or PHYS6XXX level). Students are not required to take EL if this Science major is taken as a second major but a 6-credit advanced

level course in the second major must be taken to fulfill the credit requirement.

#### Notes:

1 For students having major-major, or major-minor combinations of Astronomy-Physics, a major-major combination of Astronomy-Mathematics/Physics, a set of replacement courses from the Departments of Mathematics and Physics will be made available so that there will be no overlap with the core courses in this major. 2 Students may consider taking PHYS2627 as early as possible to allow for maximum flexibility in course selection for advanced level courses.

3 Not available in 2012-2013 or thereafter.

#### **Remarks:**

Major Title	Major in Astronomy
Offered to students admitted to Year 1 in	2009-2010

The 21st century is the golden age for astronomy as space-based telescopes are beginning 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 interest specialization in the subject, including observational astronomy, planetary science, stellar physics, and interstellar medium. Students would 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 also 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:

a. Students should be able to identify and describe astrophysical phenomena with their professional knowledge. (By means of coursework and tutorial classes in the curriculum)

b. Students should 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)

c. Students should be able to analyze astrophysical problems qualitatively and quantitatively. (By means of coursework, tutorial classes and research-based projects in the curriculum)

d. Students should be able to communicate and collaborate with people effectively in scientific issues. (By means of group projects, tutorial sessions and presentation opportunities in the curriculum)

e. Students should be able to apply scientific and quantitative methods in tackling problems in research or realworld setting.

(By means of projects, directed studies, local and foreign internships attached to universities, research centers, government bodies, NGOs and influential companies.)

#### **Minimum Entry Requirement:**

AL / AS Physics or AL Engineering Science; and HKCEE Additional Mathematics or AS Mathematics and Statistics or AL Pure Mathematics; or a pass in PHYS0114 Fundamental physics I and PHYS0115 Fundamental physics II or a pass in PHYS0625 Physics by inquiry or equivalent

#### Minimum Credit Requirement:

72 credits (18 credits introductory level, 54 credits advanced level courses including experiential learning requirement)

#### Impermissible Combination:

Minor in Astronomy

#### Required courses (72 credits) (note 1)

#### 1. Introductory level courses (18 credits)

At least 6 credits of the following courses:

BIOL0602 Origins of life and astrobiology 3 PHYS0001 Nature of the universe I: introduction to observational astronomy and the solar system (note 3) (3) PHYS0002 Nature of the universe II: stars, galaxies and cosmology for beginners (note 3) (3) PHYS0003 Nature of the universe 6

Plus at least 6 credits of the following courses:

MATH1805 University mathematics B 6 PHYS1315 Method in physics I 6

Plus at least 6 credits of the following courses:

PHYS1414 General physics I 6 PHYS1415 General physics II 6

#### PHYS1417 Basic physics 6

#### 2. Advanced level courses (48 credits)

PHYS2021 The Physical universe 6 PHYS2022 Observational astronomy 6 PHYS2627 Introductory quantum physics (note 2) 6

Plus at least 12 credits of the following courses, subject to prerequisite requirements.

MATH2601 Numerical analysis 6 PHYS2222 Wave and optics 6 PHYS2227 Laser & spectroscopy 6 PHYS2321 Introductory electromagnetism 6 PHYS2322 Statistical mechanics and thermodynamics 6 PHYS2323 Introductory quantum mechanics 6 PHYS2325 Theoretical physics 6 PHYS2626 Introductory classical mechanics 6

Plus at least 12 credits of the following courses, subject to prerequisite requirements.

PHYS2039 Principles of astronomy 6 PHYS3031 Astrophysics 6 PHYS3033 General relativity 6 PHYS3034 Cosmology 6 PHYS3035 Stellar atmospheres 6 PHYS3036 Interstellar medium 6 PHYS3037 Selected topics in astrophysics 6 PHYS3038 Planetary science 6 PHYS3040 Stellar physics 6

Plus at least 6 credits of advanced level Physics courses (PHYS2XXX or PHYS3XXX or PHYS6XXX level), subject to prerequisite requirements.

#### 3. Experiential learning requirement (6 credits) \*

Students must take at least one of the following forms of extra-learning experience to fulfill the experiential learning requirement:

- PHYS2533 Directed studies in physics 6
- PHYS3531 Physics project 12
- PHYS3987 Quantitative tools in physics (non-credit bearing)
- PHYS3988 Physics internship 6
- SCNC2005 Career development for science students (non-credit bearing)
- SCNC2988 Service learning internship (non-credit bearing)

- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)

- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (noncredit bearing)

\* If the extra-learning experience is fulfilled by non-credit bearing activities, students must take an additional 6credit advanced level physics course (PHYS2XXX or PHYS3XXX or PHYS6XXX level). Students are not required to take EL if this Science major is taken as a second major but a 6-credit advanced level course in the second major must be taken to fulfill the credit requirement.

#### Notes:

1 For students having major-major, or major-minor combinations of Astronomy-Physics, a major-major combination of Astronomy-Mathematics/Physics, a set of replacement courses from the Departments of Mathematics and Physics will be made available so that there will be no overlap with the core courses in this major. 2 Students may consider taking PHYS2627 as early as possible to allow for maximum flexibility in course selection for advanced level courses.

3 Not available in 2012-2013 or thereafter.

#### **Remarks:**

Major Title	Major in Biochemistry
Offered to students admitted to Year 1 in	2012-2013

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 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 to play a leading role in society in the future.

#### Learning Outcomes:

a. Students would be able to 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)

b. Students would be able to 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)

c. Students would be able to interpret and communicate scientific data and literature using appropriate scientific language

(by means of literature-based coursework and debate)

d. Students would be able to 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)

e. Students would be able to 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)

#### Minimum Entry Requirement:

AL Chemistry or a pass in CHEM0008 Fundamental chemistry or equivalent

#### Minimum Credit Requirement:

72 credits (18 credits introductory level, 54 credits advanced level courses including experiential learning requirement)

#### Impermissible Combination:

Minor in Biochemistry

#### Required courses (72 credits)

#### 1. Introductory level courses (18 credits)

BIOC1001 Basic biochemistry 6 BIOC1003 Introduction to molecular genetics 6 CHEM1401 Fundamentals of organic chemistry 6 OR CHEM1003 Chemistry: the molecular world 6

#### 2. Advanced level courses (48 credits)

At least 48 credits of the following courses:

BIOC2601 Metabolism 6 BIOC2602 Understanding metabolic diseases 6 BIOC2603 Principles of molecular genetics 6 BIOC2604 Essential techniques in biochemistry and molecular biology 6 BIOC3608 Sequence bioinformatics 6 BIOC3610 Advanced biochemistry I 6 BIOC3611 Advanced biochemistry II 6 BIOC3613 Molecular biology of the gene 6 BIOC3615 Advanced techniques in biochemistry & molecular biology 6 BIOL2301 Protein structure and function 6

#### 3. Experiential learning requirement (6 credits) \*

Students must take at least one of the following forms of extra-ordinary learning experience to fulfill the experiential learning requirement:

- BIOC2616 Directed studies in biochemistry 6
- BIOC3614 Biochemistry project 12
- BIOC3988 Biochemistry internship 6
- SCNC2005 Career development for science students (non-credit bearing)
- SCNC2988 Service learning internship (non-credit bearing)

- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)

- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (noncredit bearing)

\* If the extra- ordinary learning experience is fulfilled by non-credit bearing activities, students must take an additional 6-credit advanced level biochemistry course (BIOC2XXX or BIOC3XXX level). Students are not required to take EL if this Science major is taken as a second major but a 6-credit advanced level course in the second major must be taken to fulfill the credit requirement.

#### Remarks:

Major Title	Major in Biochemistry
Offered to students admitted to Year 1 in	2011-2012

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 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 to play a leading role in society in the future.

#### Learning Outcomes:

a. Students would be able to 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)

b. Students would be able to 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)

c. Students would be able to interpret and communicate scientific data and literature using appropriate scientific language

(by means of literature-based coursework and debate)

d. Students would be able to 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)

e. Students would be able to 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)

#### Minimum Entry Requirement:

AL Chemistry or a pass in CHEM0008 Fundamental chemistry or equivalent

#### Minimum Credit Requirement:

72 credits (18 credits introductory level, 54 credits advanced level courses including experiential learning requirement)

#### Impermissible Combination:

Minor in Biochemistry

#### **Required courses (72 credits)**

#### 1. Introductory level courses (18 credits)

BIOC1001 Basic biochemistry 6 BIOC1003 Introduction to molecular genetics 6 CHEM1401 Fundamentals of organic chemistry 6 OR CHEM1003 Chemistry: the molecular world 6

#### 2. Advanced level courses (48 credits)

At least 48 credits of the following courses:

BIOC2601 Metabolism 6 BIOC2602 Understanding metabolic diseases 6 BIOC2603 Principles of molecular genetics 6 BIOC2604 Essential techniques in biochemistry and molecular biology 6 BIOC3608 Introduction to bioinformatics OR Sequence bioinformatics 6 BIOC3610 Advanced biochemistry I 6 BIOC3611 Advanced biochemistry II 6 BIOC3613 Molecular biology of the gene 6 BIOC3615 Advanced techniques in biochemistry & molecular biology 6 BIOL2301 Protein structure and function 6

#### 3. Experiential learning requirement (6 credits) \*

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- BIOC2616 Directed studies in biochemistry 6
- BIOC3614 Biochemistry project 12
- BIOC3988 Biochemistry internship 6
- SCNC2005 Career development for science students (non-credit bearing)
- SCNC2988 Service learning internship (non-credit bearing)

- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)

- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (noncredit bearing)

\* If the extra- ordinary learning experience is fulfilled by non-credit bearing activities, students must take an additional 6-credit advanced level biochemistry course (BIOC2XXX or BIOC3XXX level). Students are not required to take EL if this Science major is taken as a second major but a 6-credit advanced level course in the second major must be taken to fulfill the credit requirement.

#### **Remarks:**

Major Title	Major in Biochemistry
Offered to students admitted to Year 1 in	2010-2011

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 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 to play a leading role in society in the future.

#### Learning Outcomes:

a. Students would be able to 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

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b. Students would be able to 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

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c. Students would be able to interpret and communicate scientific data and literature using appropriate scientific language

(by means of literature-based coursework and debate)

d. Students would be able to 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)

e. Students would be able to 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)

#### Minimum Entry Requirement:

AL Chemistry or a pass in CHEM0008 Fundamental chemistry or equivalent

#### Minimum Credit Requirement:

72 credits (18 credits introductory level, 54 credits advanced level courses including experiential learning requirement)

#### Impermissible Combination:

Minor in Biochemistry

#### Required courses (72 credits)

#### 1. Introductory level courses (18 credits)

BIOC1001 Basic biochemistry 6 BIOC1003 Introduction to molecular genetics 6 CHEM1401 Fundamentals of organic chemistry 6 OR CHEM1003 Chemistry: the molecular world 6

#### 2. Advanced level courses (48 credits)

At least 48 credits of the following courses:

BIOC2601 Metabolism 6 BIOC2602 Understanding metabolic diseases 6 BIOC2603 Principles of molecular genetics 6 BIOC2604 Essential techniques in biochemistry and molecular biology 6 BIOC3608 Introduction to bioinformatics OR Sequence bioinformatics 6 BIOC3610 Advanced biochemistry I 6 BIOC3611 Advanced biochemistry II 6 BIOC3613 Molecular biology of the gene 6 BIOC3615 Advanced techniques in biochemistry & molecular biology 6 BIOL2301 Protein structure and function 6

#### 3. Experiential learning requirement (6 credits) \*

Students must take at least one of the following forms of extra-ordinary learning experience to fulfill the experiential learning requirement:

- BIOC2616 Directed studies in biochemistry 6
- BIOC3614 Biochemistry project 12
- BIOC3988 Biochemistry internship 6
- SCNC2005 Career development for science students (non-credit bearing)
- SCNC2988 Service learning internship (non-credit bearing)

- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)

- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (noncredit bearing)

\* If the extra- ordinary learning experience is fulfilled by non-credit bearing activities, students must take an additional 6-credit advanced level biochemistry course (BIOC2XXX or BIOC3XXX level). Students are not required to take EL if this Science major is taken as a second major but a 6-credit advanced level course in the second major must be taken to fulfill the credit requirement.

#### **Remarks:**

Major Title	Major in Biochemistry
Offered to students admitted to Year 1 in	2009-2010

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 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 to play a leading role in society in the future.

#### Learning Outcomes:

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c. Students would be able to interpret and communicate scientific data and literature using appropriate scientific language

(by means of literature-based coursework and debate)

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e. Students would be able to 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)

#### Minimum Entry Requirement:

AL Chemistry or a pass in CHEM0008 Fundamental chemistry or equivalent

#### Minimum Credit Requirement:

72 credits (18 credits introductory level, 54 credits advanced level courses including experiential learning requirement)

#### Impermissible Combination:

Minor in Biochemistry

#### Required courses (72 credits)

#### 1. Introductory level courses (18 credits)

BIOC1001 Basic biochemistry 6 BIOC1003 Introduction to molecular genetics 6 CHEM1401 Fundamentals of organic chemistry 6 OR CHEM1003 Chemistry: the molecular world 6

#### 2. Advanced level courses (48 credits)

At least 48 credits of the following courses:

BIOC2601 Metabolism 6 BIOC2602 Understanding metabolic diseases 6 BIOC2603 Principles of molecular genetics 6 BIOC2604 Essential techniques in biochemistry and molecular biology 6 BIOC3608 Introduction to bioinformatics OR Sequence bioinformatics 6 BIOC3610 Advanced biochemistry I 6 BIOC3611 Advanced biochemistry II 6 BIOC3613 Molecular biology of the gene 6 BIOC3615 Advanced techniques in biochemistry & molecular biology 6 BIOL2301 Protein structure and function 6

#### 3. Experiential learning requirement (6 credits) \*

Students must take at least one of the following forms of extra-ordinary learning experience to fulfill the experiential learning requirement:

- BIOC2616 Directed studies in biochemistry 6
- BIOC3614 Biochemistry project 12
- BIOC3988 Biochemistry internship 6
- SCNC2005 Career development for science students (non-credit bearing)
- SCNC2988 Service learning internship (non-credit bearing)

- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)

- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (noncredit bearing)

\* If the extra- ordinary learning experience is fulfilled by non-credit bearing activities, students must take an additional 6-credit advanced level biochemistry course (BIOC2XXX or BIOC3XXX level). Students are not required to take EL if this Science major is taken as a second major but a 6-credit advanced level course in the second major must be taken to fulfill the credit requirement.

#### **Remarks:**

Major Title	Major in Biology
Offered to students admitted to Year 1 in	2012-2013

The aim of this major is to provide students with a gratifying learning experience in biology. Biology is a multidisciplinary broad-based subject that forms the foundation for all life sciences in modern days. The curriculum places strong emphasis in major aspects of biology including genetics, evolution, and molecular, cellular and organismic biosystems. The program provides trainings in fundamental laboratory skills with complementary core courses. In addition, students also have the flexibility to choose from a variety of elective courses so that they may specialize in certain discipline of their own interests. Specialization is currently possible in 1) genetics and evolution, 2) molecular and cellular biology, and 3) physiology and systems biology. The curriculum also places strong emphasis on experiential learning, which includes internship programs, undergraduate directed studies and research projects. Students graduate from the program should be able to meet all the requirements for higher degree in M.Phil. and Ph.D. of various disciplines in biology and biotechnology, as well as professional programs including medicine and dentistry.

#### Learning Outcomes:

a. Students will be able to develop scientific inquiry and critical thinking skills, including the ability to understand, analyze, and evaluate problems in order to develop solutions.

(by means of coursework and laboratory-based and/or research-based learning in the curriculum)

b. Students will be able to understand broader scientific concepts, and be able to relate these to scientific issues of significance in their daily lives and also of more global significance.
 (by means of coursework and laboratory-based and/or research-based learning in the curriculum)

c. Students will be able to communicate (oral and written), and gain confidence in interacting with their peers and professors individually and as part of a team.

(by means of coursework and laboratory-based learning, group project and presentation opportunities in the curriculum)

d. Students will be able to understand and apply key concepts in genetics, evolution, molecular biology, biochemistry, cell biology, physiology and ecosystem. (by means of coursework and laboratory-based and/or research-based learning in the curriculum)

e. Students will be able to acquire laboratory techniques essential to engaging in experimental studies involving protein, DNA and micro-organisms.

(by means of coursework and laboratory-based and/or research-based learning in the curriculum)

#### Minimum Entry Requirement:

AL Biology or equivalent or a pass in BIOL0126 Fundamentals of biology

#### **Minimum Credit Requirement:**

72 credits (18 credits introductory level, 54 credits advanced level courses including experiential learning requirement)

#### Impermissible Combination:

Minor in Biology

#### **Required courses (72 credits)**

#### 1. Introductory level courses (18 credits)

BIOL0604 Evolutionary diversity 6 BIOL1122 Functional biology 6 BIOL1133 Biological sciences laboratory course 6

(students are strongly recommended to take "BIOL1125 Introduction to biochemistry" as an elective)

#### 2. Advanced level courses (48 credits)

BIOL2112 Plant physiology 6 BIOL2115 Cell biology & cell technology 6 BIOL2119 Genetics 6 BIOL2215 Animal physiology & environmental adaptation 6 BIOL2303 Molecular biology 6

Plus 18 credits of BIOL2XXX or BIOL3XXX level course

Students are recommended to take the following courses:

BIOL2207 Endocrinology: human physiology II 6 BIOL2210 Evolution 6 BIOL2218 Human physiology 6 BIOL2611 Systematics & phylogenetics 6 BIOL3325 Molecular phylogenetics and evolution 6

#### 3. Experiential learning requirement (6 credits) \*

Students must take at least one of the following forms of extra-ordinary learning experience to fulfill the experiential learning requirement:

- BIOL2318 Biological sciences field course 6

- BIOL2320 Directed studies in biological sciences 6
- BIOL3321 Biological sciences project 12
- BIOL3988 Biological sciences internship 6
- SCNC2005 Career development for science students (non-credit bearing)
- SCNC2988 Service learning internship (non-credit bearing)

- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)

- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (noncredit bearing)

\* If the extra-ordinary learning experience is fulfilled by non-credit bearing activities, students must take an additional 6-credit advanced level biological sciences course (BIOL2XXX or BIOL3XXX level). Students are not required to take EL if this Science major is taken as a second major but a 6-credit advanced level course in the second major must be taken to fulfill the credit requirement.

#### **Remarks:**

Major Title	Major in Biology
Offered to students admitted to Year 1 in	2011-2012

The aim of this major is to provide students with a gratifying learning experience in biology. Biology is a multidisciplinary broad-based subject that forms the foundation for all life sciences in modern days. The curriculum places strong emphasis in major aspects of biology including genetics, evolution, and molecular, cellular and organismic biosystems. The program provides trainings in fundamental laboratory skills with complementary core courses. In addition, students also have the flexibility to choose from a variety of elective courses so that they may specialize in certain discipline of their own interests. Specialization is currently possible in 1) genetics and evolution, 2) molecular and cellular biology, and 3) physiology and systems biology. The curriculum also places strong emphasis on experiential learning, which includes internship programs, undergraduate directed studies and research projects. Students graduate from the program should be able to meet all the requirements for higher degree in M.Phil. and Ph.D. of various disciplines in biology and biotechnology, as well as professional programs including medicine and dentistry.

#### Learning Outcomes:

a. Students will be able to develop scientific inquiry and critical thinking skills, including the ability to understand, analyze, and evaluate problems in order to develop solutions.

(by means of coursework and laboratory-based and/or research-based learning in the curriculum)

b. Students will be able to understand broader scientific concepts, and be able to relate these to scientific issues of significance in their daily lives and also of more global significance.
 (by means of coursework and laboratory-based and/or research-based learning in the curriculum)

c. Students will be able to communicate (oral and written), and gain confidence in interacting with their peers and professors individually and as part of a team.

(by means of coursework and laboratory-based learning, group project and presentation opportunities in the curriculum)

d. Students will be able to understand and apply key concepts in genetics, evolution, molecular biology, biochemistry, cell biology, physiology and ecosystem. (by means of coursework and laboratory-based and/or research-based learning in the curriculum)

e. Students will be able to acquire laboratory techniques essential to engaging in experimental studies involving protein, DNA and micro-organisms.

(by means of coursework and laboratory-based and/or research-based learning in the curriculum)

#### Minimum Entry Requirement:

AL Biology or equivalent or a pass in BIOL0126 Fundamentals of biology

#### Minimum Credit Requirement:

72 credits (18 credits introductory level, 54 credits advanced level courses including experiential learning requirement)

#### Impermissible Combination:

Minor in Biology

#### Required courses (72 credits)

#### 1. Introductory level courses (18 credits)

BIOL0604 Evolutionary diversity 6 BIOL1122 Functional biology 6 BIOL1133 Biological sciences laboratory course 6

(students are strongly recommended to take "BIOL1125 Introduction to biochemistry" as an elective)

#### 2. Advanced level courses (48 credits)

BIOL2112 Plant physiology 6 BIOL2115 Cell biology & cell technology 6 BIOL2116 Genetics I (note 1) OR BIOL2119 Genetics 6 BIOL2215 Animal physiology: functional interactions with environment OR Animal physiology & environmental adaptation 6 BIOL2303 Molecular biology 6

#### Plus 18 credits of BIOL2XXX or BIOL3XXX level course

Students are recommended to take the following courses:

BIOL2117 Genetics II (note 1) 6 BIOL2207 Endocrinology: human physiology II 6 BIOL2210 Evolution 6 BIOL2218 Human physiology 6 BIOL2611 Systematics & phylogenetics 6 BIOL3325 Molecular phylogenetics and evolution 6

#### 3. Experiential learning requirement (6 credits) \*

Students must take at least one of the following forms of extra-ordinary learning experience to fulfill the experiential learning requirement:

- BIOL2318 Biological sciences field course 6

- BIOL2320 Directed studies in biological sciences 6
- BIOL3321 Biological sciences project 12
- BIOL3988 Biological sciences internship 6
- SCNC2005 Career development for science students (non-credit bearing)
- SCNC2988 Service learning internship (non-credit bearing)

- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)

- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (noncredit bearing)

\* If the extra-ordinary learning experience is fulfilled by non-credit bearing activities, students must take an additional 6-credit advanced level biological sciences course (BIOL2XXX or BIOL3XXX level). Students are not required to take EL if this Science major is taken as a second major but a 6-credit advanced level course in the second major must be taken to fulfill the credit requirement.

#### Notes:

1. Starting from the academic year 2012-2013, students should take BIOL2119 Genetics which is equivalent to BIOL2116 Genetics I or BIOL2117 Genetics II.

#### **Remarks:**

Major Title	Major in Biology
Offered to students admitted to Year 1 in	2010-2011

The aim of this major is to provide students with a gratifying learning experience in biology. Biology is a multidisciplinary broad-based subject that forms the foundation for all life sciences in modern days. The curriculum places strong emphasis in major aspects of biology including genetics, evolution, and molecular, cellular and organismic biosystems. The program provides trainings in fundamental laboratory skills with complementary core courses. In addition, students also have the flexibility to choose from a variety of elective courses so that they may specialize in certain discipline of their own interests. Specialization is currently possible in 1) genetics and evolution, 2) molecular and cellular biology, and 3) physiology and systems biology. The curriculum also places strong emphasis on experiential learning, which includes internship programs, undergraduate directed studies and research projects. Students graduate from the program should be able to meet all the requirements for higher degree in M.Phil. and Ph.D. of various disciplines in biology and biotechnology, as well as professional programs including medicine and dentistry.

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a. Students will be able to develop scientific inquiry and critical thinking skills, including the ability to understand, analyze, and evaluate problems in order to develop solutions.

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#### Minimum Entry Requirement:

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BIOL0604 Evolutionary diversity 6 BIOL1122 Functional biology 6 BIOL1133 Biological sciences laboratory course 6

(students are strongly recommended to take "BIOL1125 Introduction to biochemistry" as an elective)

#### 2. Advanced level courses (48 credits)

BIOL2112 Plant physiology 6 BIOL2115 Cell biology & cell technology 6 BIOL2116 Genetics I (note 1) OR BIOL2119 Genetics 6 BIOL2215 Animal physiology: functional interactions with environment OR Animal physiology & environmental adaptation 6 BIOL2303 Molecular biology 6

#### Plus 18 credits of BIOL2XXX or BIOL3XXX level course

Students are recommended to take the following courses:

BIOL2117 Genetics II (note 1) 6 BIOL2207 Endocrinology: human physiology II 6 BIOL2210 Evolution 6 BIOL2218 Human physiology 6 BIOL2611 Systematics & phylogenetics 6 BIOL3325 Molecular phylogenetics and evolution 6

#### 3. Experiential learning requirement (6 credits) \*

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- SCNC2005 Career development for science students (non-credit bearing)
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- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)

- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (noncredit bearing)

\* If the extra-ordinary learning experience is fulfilled by non-credit bearing activities, students must take an additional 6-credit advanced level biological sciences course (BIOL2XXX or BIOL3XXX level). Students are not required to take EL if this Science major is taken as a second major but a 6-credit advanced level course in the second major must be taken to fulfill the credit requirement.

#### Notes:

1. Starting from the academic year 2012-2013, students should take BIOL2119 Genetics which is equivalent to BIOL2116 Genetics I or BIOL2117 Genetics II.

#### **Remarks:**

Major Title	Major in Biology
Offered to students admitted to Year 1 in	2009-2010

The aim of this major is to provide students with a gratifying learning experience in biology. Biology is a multidisciplinary broad-based subject that forms the foundation for all life sciences in modern days. The curriculum places strong emphasis in major aspects of biology including genetics, evolution, and molecular, cellular and organismic biosystems. The program provides trainings in fundamental laboratory skills with complementary core courses. In addition, students also have the flexibility to choose from a variety of elective courses so that they may specialize in certain discipline of their own interests. Specialization is currently possible in 1) genetics and evolution, 2) molecular and cellular biology, and 3) physiology and systems biology. The curriculum also places strong emphasis on experiential learning, which includes internship programs, undergraduate directed studies and research projects. Students graduate from the program should be able to meet all the requirements for higher degree in M.Phil. and Ph.D. of various disciplines in biology and biotechnology, as well as professional programs including medicine and dentistry.

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#### Minimum Entry Requirement:

AL Biology or equivalent or a pass in BIOL0126 Fundamentals of biology

#### Minimum Credit Requirement:

72 credits (18 credits introductory level, 54 credits advanced level courses including experiential learning requirement)

#### Impermissible Combination:

Minor in Biology

#### Required courses (72 credits)

#### 1. Introductory level courses (18 credits)

BIOL0604 Evolutionary diversity 6 BIOL1122 Functional biology 6 BIOL1133 Biological sciences laboratory course 6

(students are strongly recommended to take "BIOL1125 Introduction to biochemistry" as an elective)

#### 2. Advanced level courses (48 credits)

BIOL2112 Plant physiology 6 BIOL2115 Cell biology & cell technology 6 BIOL2116 Genetics I (note 1) OR BIOL2119 Genetics 6 BIOL2215 Animal physiology OR Animal physiology: functional interactions with environment OR Animal physiology & environmental adaptation 6 BIOL2303 Molecular biology 6

#### Plus 18 credits of BIOL2XXX or BIOL3XXX level course

Students are recommended to take the following courses:

BIOL2117 Genetics II (note 1) 6 BIOL2207 Endocrinology: human physiology II 6 BIOL2210 Evolution 6 BIOL2611 Systematics & phylogenetics 6

#### 3. Experiential learning requirement (6 credits) \*

Students must take at least one of the following forms of extra-ordinary learning experience to fulfill the experiential learning requirement:

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- BIOL2320 Directed studies in biological sciences 6
- BIOL3321 Biological sciences project 12
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- SCNC2005 Career development for science students (non-credit bearing)
- SCNC2988 Service learning internship (non-credit bearing)

- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)

- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (noncredit bearing)

\* If the extra-ordinary learning experience is fulfilled by non-credit bearing activities, students must take an additional 6-credit advanced level biological sciences course (BIOL2XXX or BIOL3XXX level). Students are not required to take EL if this Science major is taken as a second major but a 6-credit advanced level course in the second major must be taken to fulfill the credit requirement.

#### Notes:

1. Starting from the academic year 2012-2013, students should take BIOL2119 Genetics which is equivalent to BIOL2116 Genetics I or BIOL2117 Genetics II.

#### **Remarks:**

Major Title	Major in Biotechnology
Offered to students admitted to Year 1 in	2012-2013

The Biotechnology curriculum trains students to use the advantage of biological insights and apply them to medicine, agriculture and environment. Biotechnology students will be equipped with solid background knowledge in molecular biology, biochemistry, genetics, microbiology, and cell biology. Based on further interests, they will acquire knowledge in the specialized fields of medicine, diagnostics, drug development, agriculture, aquaculture, etc., from the advanced courses. Biotechnology graduates are prepared to enter various sectors of industry and Government, including R&D, manufacturing, and sales and inspectors, or continue their education in professional programs or graduate school. The curriculum places strong emphasis on combining lecture courses with experiential learning, which includes laboratory studies, internship programs, and research projects, to enhance the student's knowledge in biotechnology, to improve their thinking and communication skills, and to apply their science knowledge to real-world situations.

#### Learning Outcomes:

a. Describe key concepts in molecular biology, biochemistry, genetics, microbiology, and cell biology. (by means of coursework and laboratory-based and/or research-based opportunities in the curriculum)

b. Acquire and apply laboratory techniques essential to biotechnology. (by means of coursework and laboratory-based and/or research-based opportunities in the curriculum)

c. Cooperate and work with other students.

(by means of coursework, research-based learning and group project in the curriculum)

d. Communicate in written and oral communication skills. (by means of coursework, research-based learning and presentation opportunities in the curriculum)

e. Develop scientific inquiry and critical thinking skills, including the ability to understand, analyze, and evaluate problems in the field and develop solutions. (by means of coursework and laboratory-based and/or research-based opportunities in the curriculum)

(by means of coursework and laboratory-based and/or research-based opportunities in the curricului

f. Gain insight into real-life experience in the applications of biotechnology. (by means of coursework, laboratory-based and experiential learning in the curriculum)

#### Minimum Entry Requirement:

AL Biology or equivalent or a pass in BIOL0126 Fundamentals of biology

#### Minimum Credit Requirement:

72 credits (18 credits introductory level, 54 credits advanced level courses including experiential learning requirement)

#### Impermissible Combination:

Minor in Biotechnology

#### Required courses (72 credits)

#### 1. Introductory level courses (18 credits)

BIOL1122 Functional biology 6 BIOL1125 Introduction to biochemistry 6 BIOL1133 Biological sciences laboratory course 6

#### 2. Advanced level courses (48 credits)

BIOL2115 Cell biology & cell technology 6 BIOL2301 Protein structure and function 6 BIOL2303 Molecular biology 6 BIOL3315 Animal biotechnology 6 BIOL3316 Plant biotechnology 6 BIOL3317 Microbial biotechnology 6

Plus at least 12 credits of the following courses:

BIOL2111 Molecular microbiology 6 BIOL2119 Genetics 6 BIOL2203 Reproduction & reproductive biotechnology 6 BIOL2205 Immunology 6 BIOL2302 Fermentation technology 6 BIOL3214 General virology 6 BIOL3219 Clinical microbiology and applied immunology 6 BIOL3307 Biotechnology industry 6

#### 3. Experiential learning requirement (6 credits) \*

Students must take at least one of the following forms of extra-ordinary learning experience to fulfill the experiential learning requirement:

- BIOL2318 Biological sciences field course 6

- BIOL2320 Directed studies in biological sciences 6
- BIOL3321 Biological sciences project 12
- BIOL3988 Biological sciences internship 6
- SCNC2005 Career development for science students (non-credit bearing)
- SCNC2988 Service learning internship (non-credit bearing)

- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)

- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (noncredit bearing)

\* If the extra-ordinary learning experience is fulfilled by non-credit bearing activities, students must take an additional 6-credit advanced level biological sciences course (BIOL2XXX or BIOL3XXX level). Students are not required to take EL if this Science major is taken as a second major but a 6-credit advanced level course in the second major must be taken to fulfill the credit requirement.

#### **Remarks:**

Major Title	Major in Biotechnology
Offered to students admitted to Year 1 in	2011-2012

The Biotechnology curriculum trains students to use the advantage of biological insights and apply them to medicine, agriculture and environment. Biotechnology students will be equipped with solid background knowledge in molecular biology, biochemistry, genetics, microbiology, and cell biology. Based on further interests, they will acquire knowledge in the specialized fields of medicine, diagnostics, drug development, agriculture, aquaculture, etc., from the advanced courses. Biotechnology graduates are prepared to enter various sectors of industry and Government, including R&D, manufacturing, and sales and inspectors, or continue their education in professional programs or graduate school. The curriculum places strong emphasis on combining lecture courses with experiential learning, which includes laboratory studies, internship programs, and research projects, to enhance the student's knowledge in biotechnology, to improve their thinking and communication skills, and to apply their science knowledge to real-world situations.

#### Learning Outcomes:

a. Describe key concepts in molecular biology, biochemistry, genetics, microbiology, and cell biology. (by means of coursework and laboratory-based and/or research-based opportunities in the curriculum)

b. Acquire and apply laboratory techniques essential to biotechnology. (by means of coursework and laboratory-based and/or research-based opportunities in the curriculum)

c. Cooperate and work with other students.

(by means of coursework, research-based learning and group project in the curriculum)

d. Communicate in written and oral communication skills. (by means of coursework, research-based learning and presentation opportunities in the curriculum)

e. Develop scientific inquiry and critical thinking skills, including the ability to understand, analyze, and evaluate problems in the field and develop solutions.

(by means of coursework and laboratory-based and/or research-based opportunities in the curriculum)

f. Gain insight into real-life experience in the applications of biotechnology. (by means of coursework, laboratory-based and experiential learning in the curriculum)

#### Minimum Entry Requirement:

AL Biology or equivalent or a pass in BIOL0126 Fundamentals of biology

#### Minimum Credit Requirement:

72 credits (18 credits introductory level, 54 credits advanced level courses including experiential learning requirement)

#### Impermissible Combination:

Minor in Biotechnology

#### Required courses (72 credits)

#### 1. Introductory level courses (18 credits)

BIOL1122 Functional biology 6 BIOL1125 Introduction to biochemistry 6 BIOL1133 Biological sciences laboratory course 6

#### 2. Advanced level courses (48 credits)

BIOL2115 Cell biology & cell technology 6 BIOL2301 Protein structure and function 6 BIOL2303 Molecular biology 6 BIOL3315 Animal biotechnology 6 BIOL3316 Plant biotechnology 6 BIOL3317 Microbial biotechnology 6

Plus at least 12 credits of the following courses:

BIOL2111 Molecular microbiology 6 BIOL2116 Genetics I (note 1) OR BIOL2119 Genetics 6 BIOL2203 Reproduction & reproductive biotechnology 6 BIOL2205 Immunology 6 BIOL2302 Fermentation technology 6 BIOL2608 Biometrics (note 2) 6 BIOL3214 General virology 6 BIOL3219 Clinical microbiology and applied immunology 6 BIOL3307 Biotechnology industry 6

## 3. Experiential learning requirement (6 credits) \*

Students must take at least one of the following forms of extra-ordinary learning experience to fulfill the experiential learning requirement:

- BIOL2318 Biological sciences field course 6

- BIOL2320 Directed studies in biological sciences 6

- BIOL3321 Biological sciences project 12

- BIOL3988 Biological sciences internship 6

- SCNC2005 Career development for science students (non-credit bearing)

- SCNC2988 Service learning internship (non-credit bearing)

- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)

- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (noncredit bearing)

\* If the extra-ordinary learning experience is fulfilled by non-credit bearing activities, students must take an additional 6-credit advanced level biological sciences course (BIOL2XXX or BIOL3XXX level). Students are not required to take EL if this Science major is taken as a second major but a 6-credit advanced level course in the second major must be taken to fulfill the credit requirement.

#### Notes:

1. Starting from the academic year 2012-2013, students should take BIOL2119 Genetics which is equivalent to BIOL2116 Genetics I.

2. Not available in 2012-2013 or thereafter.

#### **Remarks:**

Major Title	Major in Biotechnology
Offered to students admitted to Year 1 in	2010-2011

The Biotechnology curriculum trains students to use the advantage of biological insights and apply them to medicine, agriculture and environment. Biotechnology students will be equipped with solid background knowledge in molecular biology, biochemistry, genetics, microbiology, and cell biology. Based on further interests, they will acquire knowledge in the specialized fields of medicine, diagnostics, drug development, agriculture, aquaculture, etc., from the advanced courses. Biotechnology graduates are prepared to enter various sectors of industry and Government, including R&D, manufacturing, and sales and inspectors, or continue their education in professional programs or graduate school. The curriculum places strong emphasis on combining lecture courses with experiential learning, which includes laboratory studies, internship programs, and research projects, to enhance the student's knowledge in biotechnology, to improve their thinking and communication skills, and to apply their science knowledge to real-world situations.

#### Learning Outcomes:

a. Describe key concepts in molecular biology, biochemistry, genetics, microbiology, and cell biology. (by means of coursework and laboratory-based and/or research-based opportunities in the curriculum)

b. Acquire and apply laboratory techniques essential to biotechnology. (by means of coursework and laboratory-based and/or research-based opportunities in the curriculum)

c. Cooperate and work with other students.

(by means of coursework, research-based learning and group project in the curriculum)

d. Communicate in written and oral communication skills. (by means of coursework, research-based learning and presentation opportunities in the curriculum)

e. Develop scientific inquiry and critical thinking skills, including the ability to understand, analyze, and evaluate problems in the field and develop solutions.

(by means of coursework and laboratory-based and/or research-based opportunities in the curriculum)

f. Gain insight into real-life experience in the applications of biotechnology. (by means of coursework, laboratory-based and experiential learning in the curriculum)

#### Minimum Entry Requirement:

AL Biology or equivalent or a pass in BIOL0126 Fundamentals of biology

#### Minimum Credit Requirement:

72 credits (18 credits introductory level, 54 credits advanced level courses including experiential learning requirement)

#### Impermissible Combination:

Minor in Biotechnology

## Required courses (72 credits)

#### 1. Introductory level courses (18 credits)

BIOL1122 Functional biology 6 BIOL1125 Introduction to biochemistry 6 BIOL1133 Biological sciences laboratory course 6

#### 2. Advanced level courses (48 credits)

BIOL2115 Cell biology & cell technology 6 BIOL2301 Protein structure and function 6 BIOL2303 Molecular biology 6 BIOL3315 Animal biotechnology 6 BIOL3316 Plant biotechnology 6 BIOL3317 Microbial biotechnology 6

Plus at least 12 credits of the following courses:

BIOL2111 Molecular microbiology 6 BIOL2116 Genetics I (note 1) OR BIOL2119 Genetics 6 BIOL2203 Reproduction & reproductive biotechnology 6 BIOL2205 Immunology 6 BIOL2302 Fermentation technology 6 BIOL2608 Biometrics (note 2) 6 BIOL3214 General virology 6 BIOL3219 Clinical microbiology and applied immunology 6 BIOL3307 Biotechnology industry 6

## 3. Experiential learning requirement (6 credits) \*

Students must take at least one of the following forms of extra-ordinary learning experience to fulfill the experiential learning requirement:

- BIOL2318 Biological sciences field course 6

- BIOL2320 Directed studies in biological sciences 6

- BIOL3321 Biological sciences project 12

- BIOL3988 Biological sciences internship 6

- SCNC2005 Career development for science students (non-credit bearing)

- SCNC2988 Service learning internship (non-credit bearing)

- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)

- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (noncredit bearing)

\* If the extra-ordinary learning experience is fulfilled by non-credit bearing activities, students must take an additional 6-credit advanced level biological sciences course (BIOL2XXX or BIOL3XXX level). Students are not required to take EL if this Science major is taken as a second major but a 6-credit advanced level course in the second major must be taken to fulfill the credit requirement.

#### Notes:

1. Starting from the academic year 2012-2013, students should take BIOL2119 Genetics which is equivalent to BIOL2116 Genetics I.

2. Not available in 2012-2013 or thereafter.

## Remarks:

Major Title	Major in Biotechnology
Offered to students admitted to Year 1 in	2009-2010

The Biotechnology curriculum trains students to use the advantage of biological insights and apply them to medicine, agriculture and environment. Biotechnology students will be equipped with solid background knowledge in molecular biology, biochemistry, genetics, microbiology, and cell biology. Based on further interests, they will acquire knowledge in the specialized fields of medicine, diagnostics, drug development, agriculture, aquaculture, etc., from the advanced courses. Biotechnology graduates are prepared to enter various sectors of industry and Government, including R&D, manufacturing, and sales and inspectors, or continue their education in professional programs or graduate school. The curriculum places strong emphasis on combining lecture courses with experiential learning, which includes laboratory studies, internship programs, and research projects, to enhance the student's knowledge in biotechnology, to improve their thinking and communication skills, and to apply their science knowledge to real-world situations.

#### Learning Outcomes:

a. Describe key concepts in molecular biology, biochemistry, genetics, microbiology, and cell biology. (by means of coursework and laboratory-based and/or research-based opportunities in the curriculum)

b. Acquire and apply laboratory techniques essential to biotechnology. (by means of coursework and laboratory-based and/or research-based opportunities in the curriculum)

c. Cooperate and work with other students.

(by means of coursework, research-based learning and group project in the curriculum)

d. Communicate in written and oral communication skills. (by means of coursework, research-based learning and presentation opportunities in the curriculum)

e. Develop scientific inquiry and critical thinking skills, including the ability to understand, analyze, and evaluate problems in the field and develop solutions. (by means of coursework and laboratory-based and/or research-based opportunities in the curriculum)

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f. Gain insight into real-life experience in the applications of biotechnology. (by means of coursework, laboratory-based and experiential learning in the curriculum)

#### Minimum Entry Requirement:

AL Biology or equivalent or a pass in BIOL0126 Fundamentals of biology

#### Minimum Credit Requirement:

72 credits (18 credits introductory level, 54 credits advanced level courses including experiential learning requirement)

#### Impermissible Combination:

Minor in Biotechnology

## Required courses (72 credits)

#### 1. Introductory level courses (18 credits)

BIOL1122 Functional biology 6 BIOL1125 Introduction to biochemistry 6 BIOL1133 Biological sciences laboratory course 6

#### 2. Advanced level courses (48 credits)

BIOL2115 Cell biology & cell technology 6 BIOL2301 Protein structure and function 6 BIOL2303 Molecular biology 6 BIOL3315 Animal biotechnology 6 BIOL3316 Plant biotechnology 6 BIOL3317 Microbial biotechnology 6

Plus at least 12 credits of the following courses:

BIOL2111 Molecular microbiology 6 BIOL2116 Genetics I (note 1) OR BIOL2119 Genetics 6 BIOL2203 Reproduction & reproductive biotechnology 6 BIOL2205 Immunology 6 BIOL2302 Fermentation technology 6 BIOL2515 Food microbiology 6 BIOL2530 Molecular biology and nutrigenomics 6 BIOL2608 Biometrics (note 2) 6 BIOL3214 General virology 6 BIOL3219 Clinical microbiology and applied immunology 6 BIOL3307 Biotechnology industry 6

## 3. Experiential learning requirement (6 credits) \*

Students must take at least one of the following forms of extra-ordinary learning experience to fulfill the experiential learning requirement:

- BIOL2318 Biological sciences field course 6

- BIOL2320 Directed studies in biological sciences 6
- BIOL3321 Biological sciences project 12
- BIOL3988 Biological sciences internship 6
- SCNC2005 Career development for science students (non-credit bearing)
- SCNC2988 Service learning internship (non-credit bearing)

- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)

- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (noncredit bearing)

\* If the extra-ordinary learning experience is fulfilled by non-credit bearing activities, students must take an additional 6-credit advanced level biological sciences course (BIOL2XXX or BIOL3XXX level). Students are not required to take EL if this Science major is taken as a second major but a 6-credit advanced level course in the second major must be taken to fulfill the credit requirement.

## Notes:

1. Starting from the academic year 2012-2013, students should take BIOL2119 Genetics which is equivalent to BIOL2116 Genetics I.

2. Not available in 2012-2013 or thereafter.

#### **Remarks:**

Major Title	Major in Chemistry
Offered to students admitted to Year 1 in	2012-2013

The Chemistry curriculum at the University of Hong Kong aims to provide students with a solid training in the major areas of chemistry. The curriculum includes core courses covering topics in physical, inorganic, organic, analytical and applied chemistry. A wide selection of elective courses, for instance, food and water analysis, medicinal chemistry and computational chemistry, is also available to provide students with practical 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 Chemistry-Major programme will also equip students with transferable skills in both theoretical and experimental investigations in sciences that are very crucial for their future careers in a knowledge-based economy.

Our curriculum emphasizes both theory and application. Chemical principles and concepts covered in the curriculum can be easily applied to many aspects of life, such as the collection and analysis of forensic evidence, knowledge of drugs and diseases, and the analysis and identification of hazardous substances in consumer products such as pesticide residues in vegetables and food additives. 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:

a. Students would acquire and apply knowledge in different fields of chemistry, such as physical, inorganic, organic, applied and analytical chemistry.

(by means of coursework, laboratory-based, research-based and learning activities in the curriculum)

b. Students would acquire and apply knowledge in modern chemistry laboratory operations, and receive solid hands-on experience to practise the experimental skills and use instrumentation in various fields of chemistry. (by requiring no less than 100 hours of laboratory classes in the curriculum)

c. Students would acquire and apply major techniques in chemical synthesis, analysis, and characterization by means of chemical instrumentation.

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

d. Students would gain insight into the operation of local chemical industries and other chemistry careers. (by participating in student field trip opportunities in the curriculum)

e. Students would be able to personally experience the real-life industrial or research environment, and develop their initiative and interpersonal skills

(by arrangement for student internship opportunities or directed studies of no less than three weeks with chemistryrelated companies or research laboratories.)

#### Minimum Entry Requirement:

AL Chemistry or equivalent or a pass in CHEM0008 Fundamental chemistry

#### Minimum Credit Requirement:

72 credits (18 credits introductory level, 54 credits advanced level courses including experiential learning requirement)

#### Impermissible Combination:

Minor in Chemistry

## Required courses (72 credits)

#### 1. Introductory level courses (18 credits)

CHEM1002 Chemistry: principles and concepts 6 CHEM1003 Chemistry: the molecular world 6 CHEM1004 Chemistry: an experimental science I 6

## 2. Advanced level courses (48 credits)

CHEM2202 Chemical instrumentation 6 CHEM2303 Intermediate inorganic chemistry 6 CHEM2403 Intermediate organic chemistry 6 CHEM2504 Physical chemistry I: Introduction to Quantum chemistry 6 CHEM2510 Principles and applications of spectroscopic and analytical techniques 6 Plus at least 18 credits of advanced level Chemistry courses (CHEM2XXX or CHEM3XXX level) including at least 12 credits of the following courses from two different areas (note 1):

(1) CHEM3305 Advanced Inorganic Chemistry

(2) CHEM3406 Integrated Organic Synthesis OR CHEM3404 Advanced Organic Chemistry

(3) CHEM3507 Physical Chemistry II: Statistical Thermodynamics and Kinetic Theory

## 3. Experiential learning requirement (6 credits) \*

Students must take at least one of the following forms of extra-ordinary learning experience to fulfill the experiential learning requirement:

- CHEM2111 Directed studies in chemistry 6

- CHEM3105 Chemistry project 12

- CHEM3901 HKUtopia: capstone experience for chemistry undergraduates 6
- CHEM3988 Chemistry internship 6
- SCNC2005 Career development for science students (non-credit bearing)
- SCNC2988 Service learning internship (non-credit bearing)

- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)

- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (noncredit bearing)

\* If the extra-ordinary learning experience is fulfilled by non-credit bearing activities, students must take an additional 6-credit advanced level chemistry course (CHEM2XXX or CHEM3XXX level). Students are not required to take EL if this Science major is taken as a second major but a 6-credit advanced level course in the second major must be taken to fulfill the credit requirement.

#### Notes:

Students who wish to specialize in a certain area are recommended to choose courses from the following lists.
 (a) For students who are interested in Analytical Chemistry: CHEM2102, CHEM2207, CHEM3204, CHEM3206.
 (b) For students who are interested in Applied Chemistry: CHEM2103, CHEM3107, CHEM3110, CHEM3204.
 (c) For students who are interested in Medicinal Chemistry: CHEM3404, CHEM3405, CHEM3406, CHEM3407.
 (d) For students who are interested in Pure Chemistry: CHEM3106, CHEM3305, CHEM3406, CHEM3406, CHEM3506/CHEM3507.

#### **Remarks:**

Major Title	Major in Chemistry
Offered to students admitted to Year 1 in	2011-2012

The Chemistry curriculum at the University of Hong Kong aims to provide students with a solid training in the major areas of chemistry. The curriculum includes core courses covering topics in physical, inorganic, organic, analytical and applied chemistry. A wide selection of elective courses, for instance, food and water analysis, medicinal chemistry and computational chemistry, is also available to provide students with practical 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 Chemistry-Major programme will also equip students with transferable skills in both theoretical and experimental investigations in sciences that are very crucial for their future careers in a knowledge-based economy.

Our curriculum emphasizes both theory and application. Chemical principles and concepts covered in the curriculum can be easily applied to many aspects of life, such as the collection and analysis of forensic evidence, knowledge of drugs and diseases, and the analysis and identification of hazardous substances in consumer products such as pesticide residues in vegetables and food additives. 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:

a. Students would acquire and apply knowledge in different fields of chemistry, such as physical, inorganic, organic, applied and analytical chemistry.

(by means of coursework, laboratory-based, research-based and learning activities in the curriculum)

b. Students would acquire and apply knowledge in modern chemistry laboratory operations, and receive solid hands-on experience to practise the experimental skills and use instrumentation in various fields of chemistry. (by requiring no less than 100 hours of laboratory classes in the curriculum)

c. Students would acquire and apply major techniques in chemical synthesis, analysis, and characterization by means of chemical instrumentation.

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

d. Students would gain insight into the operation of local chemical industries and other chemistry careers. (by participating in student field trip opportunities in the curriculum)

e. Students would be able to personally experience the real-life industrial or research environment, and develop their initiative and interpersonal skills

(by arrangement for student internship opportunities or directed studies of no less than three weeks with chemistryrelated companies or research laboratories.)

#### Minimum Entry Requirement:

AL Chemistry or equivalent or a pass in CHEM0008 Fundamental chemistry

#### Minimum Credit Requirement:

72 credits (18 credits introductory level, 54 credits advanced level courses including experiential learning requirement)

#### Impermissible Combination:

Minor in Chemistry

## Required courses (72 credits)

#### 1. Introductory level courses (18 credits)

CHEM1002 Chemistry: principles and concepts 6 CHEM1003 Chemistry: the molecular world 6 CHEM1004 Chemistry: an experimental science I 6

#### 2. Advanced level courses (48 credits)

CHEM2202 Chemical instrumentation 6 CHEM2303 Intermediate inorganic chemistry 6 CHEM2403 Intermediate organic chemistry 6 CHEM2504 Physical chemistry I: Introduction to Quantum chemistry 6 CHEM2510 Principles and applications of spectroscopic and analytical techniques 6 Plus at least 18 credits of advanced level Chemistry courses (CHEM2XXX or CHEM3XXX level) including at least 12 credits of the following courses from two different areas (note 1):

(1) CHEM3305 Advanced Inorganic Chemistry

(2) CHEM3406 Integrated Organic Synthesis OR CHEM3404 Advanced Organic Chemistry

(3) CHEM3507 Physical Chemistry II: Statistical Thermodynamics and Kinetic Theory

## 3. Experiential learning requirement (6 credits) \*

Students must take at least one of the following forms of extra-ordinary learning experience to fulfill the experiential learning requirement:

- CHEM2111 Directed studies in chemistry 6

- CHEM3105 Chemistry project 12

- CHEM3901 HKUtopia: capstone experience for chemistry undergraduates 6
- CHEM3988 Chemistry internship 6
- SCNC2005 Career development for science students (non-credit bearing)
- SCNC2988 Service learning internship (non-credit bearing)

- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)

- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (noncredit bearing)

\* If the extra-ordinary learning experience is fulfilled by non-credit bearing activities, students must take an additional 6-credit advanced level chemistry course (CHEM2XXX or CHEM3XXX level). Students are not required to take EL if this Science major is taken as a second major but a 6-credit advanced level course in the second major must be taken to fulfill the credit requirement.

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#### **Remarks:**

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#### Learning Outcomes:

a. Students would acquire and apply knowledge in different fields of chemistry, such as physical, inorganic, organic, applied and analytical chemistry.

(by means of coursework, laboratory-based, research-based and learning activities in the curriculum)

b. Students would acquire and apply knowledge in modern chemistry laboratory operations, and receive solid hands-on experience to practise the experimental skills and use instrumentation in various fields of chemistry. (by requiring no less than 100 hours of laboratory classes in the curriculum)

c. Students would acquire and apply major techniques in chemical synthesis, analysis, and characterization by means of chemical instrumentation.

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

d. Students would gain insight into the operation of local chemical industries and other chemistry careers. (by participating in student field trip opportunities in the curriculum)

e. Students would be able to personally experience the real-life industrial or research environment, and develop their initiative and interpersonal skills

(by arrangement for student internship opportunities or directed studies of no less than three weeks with chemistryrelated companies or research laboratories.)

#### Minimum Entry Requirement:

AL Chemistry or equivalent or a pass in CHEM0008 Fundamental chemistry

#### Minimum Credit Requirement:

72 credits (18 credits introductory level, 54 credits advanced level courses including experiential learning requirement)

#### Impermissible Combination:

Minor in Chemistry

## Required courses (72 credits)

#### 1. Introductory level courses (18 credits)

CHEM1002 Chemistry: principles and concepts 6 CHEM1003 Chemistry: the molecular world 6 CHEM1004 Chemistry: an experimental science I 6

#### 2. Advanced level courses (48 credits)

CHEM2202 Chemical instrumentation 6 CHEM2303 Intermediate inorganic chemistry 6 CHEM2403 Intermediate organic chemistry 6 CHEM2504 Physical chemistry I: introduction to quantum chemistry 6 CHEM2510 Principles and applications of spectroscopic and analytical techniques 6 Plus at least 18 credits of advanced level Chemistry courses (CHEM2XXX or CHEM3XXX level) including at least 12 credits of the following courses from two different areas (notes 1 and 2):

(1) CHEM3305 Advanced Inorganic Chemistry

(2) CHEM3406 Integrated Organic Synthesis OR CHEM3404 Advanced Organic Chemistry

(3) CHEM3507 Physical Chemistry II: Statistical Thermodynamics and Kinetic Theory

## 3. Experiential learning requirement (6 credits) \*

Students must take at least one of the following forms of extra-ordinary learning experience to fulfill the experiential learning requirement:

- CHEM2111 Directed studies in chemistry 6

- CHEM3105 Chemistry project 12

- CHEM3901 HKUtopia: capstone experience for chemistry undergraduates 6
- CHEM3988 Chemistry internship 6
- SCNC2005 Career development for science students (non-credit bearing)
- SCNC2988 Service learning internship (non-credit bearing)

- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)

- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (noncredit bearing)

\* If the extra-ordinary learning experience is fulfilled by non-credit bearing activities, students must take an additional 6-credit advanced level chemistry course (CHEM2XXX or CHEM3XXX level). Students are not required to take EL if this Science major is taken as a second major but a 6-credit advanced level course in the second major must be taken to fulfill the credit requirement.

#### Notes:

1 Students who wish to specialize in a certain area are recommended to choose courses from the following lists. (a) For students who are interested in Analytical Chemistry: CHEM2102, CHEM2207, CHEM3204, CHEM3206. (b) For students who are interested in Applied Chemistry: CHEM2103, CHEM3107, CHEM3110, CHEM3204. (c) For students who are interested in Medicinal Chemistry: CHEM3404, CHEM3405, CHEM3406, CHEM3407. (d) For students who are interested in Pure Chemistry: CHEM3106, CHEM3305, CHEM3406, CHEM3406, CHEM3506/CHEM3507.

2 Students who have passed CHEM2402 in 2010-2011 are not allowed to take CHEM2403. These students may take CHEM3403 Integrated organic synthesis (9) as a required CHEM3XXX level course in organic chemistry.

#### **Remarks:**

Major Title	Major in Chemistry
Offered to students admitted to Year 1 in	2009-2010

The Chemistry curriculum at the University of Hong Kong aims to provide students with a solid training in the major areas of chemistry. The curriculum includes core courses covering topics in physical, inorganic, organic, analytical and applied chemistry. A wide selection of elective courses, for instance, food and water analysis, medicinal chemistry and computational chemistry, is also available to provide students with practical 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 Chemistry-Major programme will also equip students with transferable skills in both theoretical and experimental investigations in sciences that are very crucial for their future careers in a knowledge-based economy.

Our curriculum emphasizes both theory and application. Chemical principles and concepts covered in the curriculum can be easily applied to many aspects of life, such as the collection and analysis of forensic evidence, knowledge of drugs and diseases, and the analysis and identification of hazardous substances in consumer products such as pesticide residues in vegetables and food additives. 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:

a. Students would acquire and apply knowledge in different fields of chemistry, such as physical, inorganic, organic, applied and analytical chemistry.

(by means of coursework, laboratory-based, research-based and learning activities in the curriculum)

b. Students would acquire and apply knowledge in modern chemistry laboratory operations, and receive solid hands-on experience to practise the experimental skills and use instrumentation in various fields of chemistry. (by requiring no less than 100 hours of laboratory classes in the curriculum)

c. Students would acquire and apply major techniques in chemical synthesis, analysis, and characterization by means of chemical instrumentation.

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

d. Students would gain insight into the operation of local chemical industries and other chemistry careers. (by participating in student field trip opportunities in the curriculum)

e. Students would be able to personally experience the real-life industrial or research environment, and develop their initiative and interpersonal skills

(by arrangement for student internship opportunities or directed studies of no less than three weeks with chemistryrelated companies or research laboratories.)

#### Minimum Entry Requirement:

AL Chemistry or equivalent or a pass in CHEM0008 Fundamental chemistry

#### Minimum Credit Requirement:

72 credits (18 credits introductory level, 54 credits advanced level courses including experiential learning requirement)

#### Impermissible Combination:

Minor in Chemistry

## Required courses (72 credits)

#### 1. Introductory level courses (18 credits)

CHEM1002 Chemistry: principles and concepts 6 CHEM1003 Chemistry: the molecular world 6 CHEM1004 Chemistry: an experimental science I 6

#### 2. Advanced level courses (48 credits)

CHEM2202 Chemical instrumentation 6 CHEM2302 Intermediate inorganic chemistry 9 CHEM2402 Intermediate organic chemistry 9 CHEM2503 Intermediate physical chemistry 9 CHEM2510 Principles and applications of spectroscopic and analytical techniques 6 Plus at least 9 credits of advanced level Chemistry courses (CHEM2XXX or CHEM3XXX level) of which 6 credits must be at CHEM3XXX level, subject to prerequisite requirements. (notes 1 and 2)

## 3. Experiential learning requirement (6 credits) \*

Students must take at least one of the following forms of extra-ordinary learning experience to fulfill the experiential learning requirement:

- CHEM2111 Directed studies in chemistry 6
- CHEM3105 Chemistry project 12
- CHEM3901 HKUtopia: capstone experience for chemistry undergraduates 6
- CHEM3988 Chemistry internship 6
- SCNC2005 Career development for science students (non-credit bearing)
- SCNC2988 Service learning internship (non-credit bearing)
- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)

- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (noncredit bearing)

\* If the extra-ordinary learning experience is fulfilled by non-credit bearing activities, students must take an additional 6-credit advanced level chemistry course (CHEM2XXX or CHEM3XXX level). Students are not required to take EL if this Science major is taken as a second major but a 6-credit advanced level course in the second major must be taken to fulfill the credit requirement.

#### Notes:

Students who wish to specialize in a certain area are recommended to choose courses from the following lists.
 (a) For students who are interested in Analytical Chemistry: CHEM2102, CHEM2207, CHEM3203, CHEM3204.
 (b) For students who are interested in Applied Chemistry: CHEM2103, CHEM3107, CHEM3110, CHEM3204.
 (c) For students who are interested in Medicinal Chemistry: CHEM3403, CHEM3404, CHEM3405, CHEM3407.
 (d) For students who are interested in Pure Chemistry: CHEM3106, CHEM3303, CHEM3403, CHEM3403, CHEM3506/CHEM3513.

2 Students who have not completed CHEM2302, CHEM2402, and CHEM2503 by 2010-2011 may take the following new core courses as replacement. The total number of required credits of advanced courses reamins the same (48 credits):

- CHEM2303 Intermediate inorganic chemistry 6 (replaces CHEM2302)

- CHEM2403 Intermediate organic chemistry 6 (replaces CHEM2402)

- CHEM2504 Physical chemistry I: introduction to quantum chemistry 6 (replaces CHEM2503)

#### Remarks:

Major Title	Major in Earth Sciences
Offered to students admitted to Year 1 in	2012-2013

The Earth Sciences curriculum at the University of Hong Kong aims to enhance students' understanding of the nature of Earth systems and Earth processes. This includes studies of the solid earth, the atmosphere, the oceans, the biosphere, and their interactions as well as impacts of human activities on Earth's natural environment. Core courses in the curriculum emphasize fundamental knowledge and skills in the Earth Sciences, while elective courses provide either training in specific Earth Science disciplines or an extension of knowledge aimed to give students the technical skills in certain specialized or applied areas including resource development, environmental management and geotechnical applications, so that they might follow a variety of career options. Throughout the curriculum there is consistent emphasis on experiential learning through fieldwork, laboratory studies, field camps, industrial training, and research-based learning, designed to enhance the students' knowledge in earth science, improve their thinking and communication skills, outlook and attitude, and increase their ability to improvise in unforeseen situations.

#### Learning Outcomes:

a. Students would be able to describe the key concepts in the conventional areas of the geosciences, covering the areas of earth systems, physical geology, historical geology, atmospheric system, oceanography, geochemistry, geophysics, and earth resources.

(by means of coursework and learning activities in the major or minor curriculum)

b. Students would have acquired the ability to make observation, description, measurement and analysis of common geological features and experience with geological mapping on 1:10,000 scale. (by requiring of no less than 56 days of field work in the major)

c. Students would be able to cooperate and work with other students in an effective manner and have learned to accept and appreciate different cultures.

(by means of requiring students to attend at least one overseas field camp in which students have to live and work together for 3 weeks consecutively)

d. Students would have improved their communication skills.

(by means of frequent opportunities and occasions in major in which students have to give oral and posters presentations to a peer audience. )

e. Students would have gained some insights in the real-life industrial environment and developed connection within the geosciences profession.

(by arrangement for students internship opportunities of no less than four weeks with companies or government.)

# Minimum Entry Requirement: NIL

## **Minimum Credit Requirement:**

72 credits (18 credits introductory level, 54 credits advanced level courses including experiential learning requirement)

## Impermissible Combination:

Minor in Earth Sciences

## **Required courses (72 credits)**

## 1. Introductory level courses (18 credits)

EASC0105 Earth through time 6 EASC0116 Introduction to physical geology 6 EASC0118 Blue planet 6

## 2. Advanced level courses (48 credits)

Any 48 credits of advanced-level Earth Sciences courses (note 1)

## 3. Experiential learning requirement (6 credits) \*

Students must take at least one of the following forms of extra-ordinary learning experience to fulfill the experiential learning requirement:

- EASC2301 Field camps 6

- EASC2307 Directed studies in earth sciences 6
- EASC3308 Earth sciences project 12
- EASC3988 Earth sciences internship 6
- SCNC2005 Career development for science students (non-credit bearing)
- SCNC2988 Service learning internship (non-credit bearing)

- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)

- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (noncredit bearing)

\* If the extra-ordinary learning experience is fulfilled by non-credit bearing activities, students must take an additional 6-credit advanced level earth sciences course (EASC2XXX or EASC3XXX level). Students are not required to take EL if this Science major is taken as a second major but a 6-credit advanced level course in the second major must be taken to fulfill the credit requirement.

## Notes:

1 Students may optionally follow one of the following themes in Earth Sciences:

(a) Geology theme

Objective: for students interested in a career as a geologist.

EASC2108; EASC2109; EASC2113; EASC2124; EASC2125; EASC2126; plus two other advanced courses in geology (EASC2000 or EASC3000 level).

Students intending to become engineering geologists are advised to take the following courses in addition to these eight advanced level courses: EASC2004; EASC2201; EASC3202; EASC3203.

Students intending for a career in mining geology are advised to take the following course as elective: EASC3133

(b) Environmental Geology theme

Objective: for students interested in environmental geology, application of chemistry and physics to studying pollution and environmental toxicology.

EASC2112; EASC2126; EASC2127; EASC2201; EASC3133; plus any 12 credits advanced level Earth Sciences courses (EASC2000 or EASC3000 level)

(c) Atmospheric and Oceanic Studies theme

Objective: for students interested in studying the dynamics of atmospheres and oceans. Minimum requirements: EASC2005; EASC2127; ENVS2013; EASC2129; EASC2131; plus any 12 credits advanced level Earth Sciences courses (EASC2000 or EASC3000 level)

#### **Remarks:**

Major Title	Major in Earth Sciences
Offered to students admitted to Year 1 in	2011-2012

The Earth Sciences curriculum at the University of Hong Kong aims to enhance students' understanding of the nature of Earth systems and Earth processes. This includes studies of the solid earth, the atmosphere, the oceans, the biosphere, and their interactions as well as impacts of human activities on Earth's natural environment. Core courses in the curriculum emphasize fundamental knowledge and skills in the Earth Sciences, while elective courses provide either training in specific Earth Science disciplines or an extension of knowledge aimed to give students the technical skills in certain specialized or applied areas including resource development, environmental management and geotechnical applications, so that they might follow a variety of career options. Throughout the curriculum there is consistent emphasis on experiential learning through fieldwork, laboratory studies, field camps, industrial training, and research-based learning, designed to enhance the students' knowledge in earth science, improve their thinking and communication skills, outlook and attitude, and increase their ability to improvise in unforeseen situations.

#### Learning Outcomes:

a. Students would be able to describe the key concepts in the conventional areas of the geosciences, covering the areas of earth systems, physical geology, historical geology, atmospheric system, oceanography, geochemistry, geophysics, and earth resources.

(by means of coursework and learning activities in the major or minor curriculum)

b. Students would have acquired the ability to make observation, description, measurement and analysis of common geological features and experience with geological mapping on 1:10,000 scale. (by requiring of no less than 56 days of field work in the major)

c. Students would be able to cooperate and work with other students in an effective manner and have learned to accept and appreciate different cultures.

(by means of requiring students to attend at least one overseas field camp in which students have to live and work together for 3 weeks consecutively)

d. Students would have improved their communication skills.

(by means of frequent opportunities and occasions in major in which students have to give oral and posters presentations to a peer audience.)

e. Students would have gained some insights in the real-life industrial environment and developed connection within the geosciences profession.

(by arrangement for students internship opportunities of no less than four weeks with companies or government.)

#### **Minimum Entry Requirement:** NIL

#### **Minimum Credit Requirement:**

72 credits (18 credits introductory level, 54 credits advanced level courses including experiential learning requirement)

## Impermissible Combination:

Minor in Earth Sciences

## Required courses (72 credits)

#### 1. Introductory level courses (18 credits)

EASC0105 Earth through time 6 EASC0116 Introduction to physical geology 6 EASC0118 Blue planet 6

#### 2. Advanced level courses (48 credits)

Any 48 credits of advanced-level Earth Sciences courses (note 1)

#### 3. Experiential learning requirement (6 credits) \*

Students must take at least one of the following forms of extra-ordinary learning experience to fulfill the experiential learning requirement:

EASC2301 Field camps 6

- EASC2307 Directed studies in earth sciences 6
- EASC3308 Earth sciences project 12
- EASC3988 Earth sciences internship 6
- SCNC2005 Career development for science students (non-credit bearing)
- SCNC2988 Service learning internship (non-credit bearing)

- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)

- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (noncredit bearing)

\* If the extra-ordinary learning experience is fulfilled by non-credit bearing activities, students must take an additional 6-credit advanced level earth sciences course (EASC2XXX or EASC3XXX level). Students are not required to take EL if this Science major is taken as a second major but a 6-credit advanced level course in the second major must be taken to fulfill the credit requirement.

## Notes:

1 Students may optionally follow one of the following themes in Earth Sciences:

(a) Geology theme

Objective: for students interested in a career as a geologist.

EASC2108; EASC2109; EASC2113; EASC2124; EASC2125; EASC2126; plus two other advanced courses in geology (EASC2000 or EASC3000 level).

Students intending to become engineering geologists are advised to take the following courses in addition to these eight advanced level courses: EASC2004; EASC2201; EASC3202; EASC3203.

Students intending for a career in mining geology are advised to take the following course as elective: EASC3133

(b) Environmental Geology theme

Objective: for students interested in environmental geology, application of chemistry and physics to studying pollution and environmental toxicology.

EASC2112; EASC2126; EASC2127; EASC2201; EASC3133; plus any 12 credits advanced level Earth Sciences courses (EASC2000 or EASC3000 level)

(c) Atmospheric and Oceanic Studies theme

Objective: for students interested in studying the dynamics of atmospheres and oceans. Minimum requirements: EASC2005; EASC2127; ENVS2013; EASC2129; EASC2131; plus any 12 credits advanced level Earth Sciences courses (EASC2000 or EASC3000 level)

#### **Remarks:**

Major Title	Major in Earth Sciences
Offered to students admitted to Year 1 in	2010-2011

The Earth Sciences curriculum at the University of Hong Kong aims to enhance students' understanding of the nature of Earth systems and Earth processes. This includes studies of the solid earth, the atmosphere, the oceans, the biosphere, and their interactions as well as impacts of human activities on Earth's natural environment. Core courses in the curriculum emphasize fundamental knowledge and skills in the Earth Sciences, while elective courses provide either training in specific Earth Science disciplines or an extension of knowledge aimed to give students the technical skills in certain specialized or applied areas including resource development, environmental management and geotechnical applications, so that they might follow a variety of career options. Throughout the curriculum there is consistent emphasis on experiential learning through fieldwork, laboratory studies, field camps, industrial training, and research-based learning, designed to enhance the students' knowledge in earth science, improve their thinking and communication skills, outlook and attitude, and increase their ability to improvise in unforeseen situations.

#### Learning Outcomes:

a. Students would be able to describe the key concepts in the conventional areas of the geosciences, covering the areas of earth systems, physical geology, historical geology, atmospheric system, oceanography, geochemistry, geophysics, and earth resources.

(by means of coursework and learning activities in the major or minor curriculum)

b. Students would have acquired the ability to make observation, description, measurement and analysis of common geological features and experience with geological mapping on 1:10,000 scale. (by requiring of no less than 56 days of field work in the major)

c. Students would be able to cooperate and work with other students in an effective manner and have learned to accept and appreciate different cultures.

(by means of requiring students to attend at least one overseas field camp in which students have to live and work together for 3 weeks consecutively)

d. Students would have improved their communication skills.

(by means of frequent opportunities and occasions in major in which students have to give oral and posters presentations to a peer audience.)

e. Students would have gained some insights in the real-life industrial environment and developed connection within the geosciences profession.

(by arrangement for students internship opportunities of no less than four weeks with companies or government.)

# Minimum Entry Requirement: NIL

## **Minimum Credit Requirement:**

72 credits (18 credits introductory level, 54 credits advanced level courses including experiential learning requirement)

## Impermissible Combination:

Minor in Earth Sciences

## **Required courses (72 credits)**

#### 1. Introductory level courses (18 credits)

EASC0105 Earth through time 6 EASC0116 Introduction to physical geology 6 EASC0118 Blue planet 6

## 2. Advanced level courses (48 credits)

Any 48 credits of advanced-level Earth Sciences courses (note 1)

## 3. Experiential learning requirement (6 credits) \*

Students must take at least one of the following forms of extra-ordinary learning experience to fulfill the experiential learning requirement:

- EASC2301 Field camps 6

- EASC2307 Directed studies in earth sciences 6
- EASC3308 Earth sciences project 12
- EASC3988 Earth sciences internship 6
- SCNC2005 Career development for science students (non-credit bearing)
- SCNC2988 Service learning internship (non-credit bearing)

- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)

- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (noncredit bearing)

\* If the extra-ordinary learning experience is fulfilled by non-credit bearing activities, students must take an additional 6-credit advanced level earth sciences course (EASC2XXX or EASC3XXX level). Students are not required to take EL if this Science major is taken as a second major but a 6-credit advanced level course in the second major must be taken to fulfill the credit requirement.

## Notes:

1 Students may optionally follow one of the following themes in Earth Sciences:

(a) Geology theme

Objective: for students interested in a career as a geologist.

EASC2108; EASC2109; EASC2113; EASC2124; EASC2125; EASC2126; plus two other advanced courses in geology (EASC2000 or EASC3000 level).

Students intending to become engineering geologists are advised to take the following courses in addition to these eight advanced level courses: EASC2004; EASC2201; EASC3202; EASC3203.

Students intending for a career in mining geology are advised to take the following course as elective: EASC3133

(b) Environmental Geology theme

Objective: for students interested in environmental geology, application of chemistry and physics to studying pollution and environmental toxicology.

EASC2112; EASC2126; EASC2127; EASC2130; EASC2201; EASC3133; plus any 12 credits advanced level Earth Sciences courses (EASC2000 or EASC3000 level)

(c) Atmospheric and Oceanic Studies theme

Objective: for students interested in studying the dynamics of atmospheres and oceans. Minimum requirements: EASC2005; EASC2127; EASC2128; EASC2129; EASC2130; EASC2131; plus any 12 credits advanced level Earth Sciences courses (EASC2000 or EASC3000 level)

#### **Remarks:**

#### Major in Earth Sciences

2009-2010

Offered to students admitted to Year 1 in

#### **Objectives:**

The Earth Sciences curriculum at the University of Hong Kong aims to enhance students' understanding of the nature of Earth systems and Earth processes. This includes studies of the solid earth, the atmosphere, the oceans, the biosphere, and their interactions as well as impacts of human activities on Earth's natural environment. Core courses in the curriculum emphasize fundamental knowledge and skills in the Earth Sciences, while elective courses provide either training in specific Earth Science disciplines or an extension of knowledge aimed to give students the technical skills in certain specialized or applied areas including resource development, environmental management and geotechnical applications, so that they might follow a variety of career options. Throughout the curriculum there is consistent emphasis on experiential learning through fieldwork, laboratory studies, field camps, industrial training, and research-based learning, designed to enhance the students' knowledge in earth science, improve their thinking and communication skills, outlook and attitude, and increase their ability to improvise in unforeseen situations.

#### Learning Outcomes:

a. Students would be able to describe the key concepts in the conventional areas of the geosciences, covering the areas of earth systems, physical geology, historical geology, atmospheric system, oceanography, geochemistry, geophysics, and earth resources.

(by means of coursework and learning activities in the major or minor curriculum)

b. Students would have acquired the ability to make observation, description, measurement and analysis of common geological features and experience with geological mapping on 1:10,000 scale. (by requiring of no less than 56 days of field work in the major)

c. Students would be able to cooperate and work with other students in an effective manner and have learned to accept and appreciate different cultures.

(by means of requiring students to attend at least one overseas field camp in which students have to live and work together for 3 weeks consecutively)

d. Students would have improved their communication skills.

(by means of frequent opportunities and occasions in major in which students have to give oral and posters presentations to a peer audience.)

e. Students would have gained some insights in the real-life industrial environment and developed connection within the geosciences profession.

(by arrangement for students internship opportunities of no less than three weeks with companies or government.)

## Minimum Entry Requirement:

NIL

## **Minimum Credit Requirement:**

72 credits (18 credits introductory level, 54 credits advanced level courses including experiential learning requirement)

## Impermissible Combination:

Minor in Earth Sciences

## **Required courses (72 credits)**

## 1. Introductory level courses (18 credits)

EASC0105 Earth through time 6 EASC0116 Introduction to physical geology 6 EASC0118 Blue planet 6

## 2. Advanced level courses (48 credits)

Any 48 credits of advanced-level Earth Sciences courses (note 1)

## 3. Experiential learning requirement (6 credits) \*

Students must take at least one of the following forms of extra-ordinary learning experience to fulfill the experiential learning requirement:

- EASC2301 Field camps 6

- EASC2307 Directed studies in earth sciences 6

- EASC3308 Earth sciences project 12

- EASC3988 Earth sciences internship 6

- SCNC2005 Career development for science students (non-credit bearing)

- SCNC2988 Service learning internship (non-credit bearing)

- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)

- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (noncredit bearing)

\* If the extra-ordinary learning experience is fulfilled by non-credit bearing activities, students must take an additional 6-credit advanced level earth sciences course (EASC2XXX or EASC3XXX level). Students are not required to take EL if this Science major is taken as a second major but a 6-credit advanced level course in the second major must be taken to fulfill the credit requirement.

## Notes:

1 Students may optionally follow one of the following themes in Earth Sciences:

(a) Geology theme

Objective: for students demanding an education in the principles and practice of geology. The curriculum is designed to prepare students to become a practicing geologist.

EASC2108; EASC2109; EASC2113; EASC2124; EASC2125; EASC2126; plus any 12 credits advanced level Earth Sciences courses (EASC2000 or EASC3000 level)

Students intending for a career in engineering geology are advised to take the following courses as electives: EASC2004; EASC2201; EASC3202; EASC3203

Students intending for a career in mining geology are advised to take the following course as elective: EASC3133

(b) Environmental Geology theme

Objective: for students interested in environmental geology, application of chemistry and physics to studying pollution and environmental toxicology.

EASC2112; EASC2126; EASC2127; EASC2130; EASC2201; EASC3133; plus any 12 credits advanced level Earth Sciences courses (EASC2000 or EASC3000 level)

(c) Atmospheric and Oceanic Studies theme

Objective: for students interested in studying the dynamics of atmospheres and oceans. Minimum requirements: EASC2005; EASC2127; EASC2128; EASC2129; EASC2130; EASC2131; plus any 12 credits advanced level Earth Sciences courses (EASC2000 or EASC3000 level)

#### **Remarks:**

#### Major Title

Major in Ecology & Biodiversity

Offered to students admitted to Year 1 in

2012-2013

### **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 a first year-core, which emphasizes plant and animal biology and includes a compulsory week-long residential field trip. The second and third year of the major teaches students about the ecology and biodiversity of different ecosystems (e.g. marine 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 of biodiversity scientists or conservation biologists.

## Learning Outcomes:

a. 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) b. understand and appreciate the variety of life in Hong Kong's and Southeast Asia's natural habitats, and become equipped to understand, study, manage and protect that diversity;

(by means of coursework, laboratory-based, tutorial classes and/or project-based learning in the curriculum) c. 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) d. are able to 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) e. 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)

f. 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)

g. are motivated and sufficiently equipped to be able to apply the knowledge solve local, regional and global environmental problems.

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

#### **Minimum Entry Requirement:** NIL

#### **Minimum Credit Requirement:**

72 credits (18 credits introductory level, 54 credits advanced level courses including experiential learning requirement)

## Impermissible Combination:

Minor in Ecology & Biodiversity

## **Required courses (72 credits)**

## 1. Introductory level courses (18 credits)

BIOL0604 Evolutionary diversity 6 BIOL0625 Ecology and evolution 6 **BIOL1608 Biostatistics 6** 

## 2. Advanced level courses (48 credits)

BIOL2611 Systematics & phylogenetics 6

BIOL2612 Conservation ecology 6

Plus at least 36 credits of the following courses (note 1):

BIOL2210 Evolution 6 BIOL2606 Environmental microbiology 6 BIOL2607 Fish biology 6 BIOL2610 Marine biology 6 BIOL2615 Freshwater ecology 6 BIOL2617 Experimental intertidal ecology 6 BIOL2619 Terrestrial ecology 6 BIOL2621 Plant structure and evolution 6 BIOL2622 The biology of marine mammals 6 BIOL2625 Animal behaviour 6 BIOL3621 Fisheries and mariculture 6 BIOL3622 Ecological impact assessment 6 BIOL3626 Conservation in practice 6

## 3. Experiential learning requirement (6 credits) \*

Students must take at least one of the following forms of extra-ordinary learning experience to fulfill the experiential learning requirement:

- BIOL2318 Biological sciences field course 6
- BIOL2320 Directed studies in biological sciences 6
- BIOL3321 Biological sciences project 12
- BIOL3988 Biological sciences internship 6
- SCNC2005 Career development for science students (non-credit bearing)
- SCNC2988 Service learning internship (non-credit bearing)

- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)

- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (noncredit bearing)

\* If the extra-ordinary learning experience is fulfilled by non-credit bearing activities, students must take an additional 6-credit advanced level biological sciences course (BIOL2XXX or BIOL3XXX level). Students are not required to take EL if this Science major is taken as a second major but a 6-credit advanced level course in the second major must be taken to fulfill the credit requirement.

## Notes:

1. Students who wish to specialize in a certain area are recommended to choose courses from the following lists. (a) For students who are interested in ecology & evolution: BIOL2210, BIOL2606, BIOL2615, BIOL2617, BIOL2619, BIOL2621.

(b) For students who are interested in marine biology: BIOL2607, BIOL2610, BIOL2617, BIOL2622, BIOL3621.

## **Remarks:**

#### Major Title

Major in Ecology & Biodiversity

Offered to students admitted to Year 1 in

2011-2012

## **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 a first year-core, which emphasizes plant and animal biology and includes a compulsory week-long residential field trip. The second and third year of the major teaches students about the ecology and biodiversity of different ecosystems (e.g. marine 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 of biodiversity scientists or conservation biologists.

## Learning Outcomes:

a. 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) b. understand and appreciate the variety of life in Hong Kong's and Southeast Asia's natural habitats, and become equipped to understand, study, manage and protect that diversity;

(by means of coursework, laboratory-based, tutorial classes and/or project-based learning in the curriculum) c. 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) d. are able to 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) e. 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)

f. 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)

g. are motivated and sufficiently equipped to be able to apply the knowledge solve local, regional and global environmental problems.

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

#### **Minimum Entry Requirement:** NIL

#### **Minimum Credit Requirement:**

72 credits (18 credits introductory level, 54 credits advanced level courses including experiential learning requirement)

## Impermissible Combination:

Minor in Ecology & Biodiversity

## **Required courses (72 credits)**

## 1. Introductory level courses (18 credits)

BIOL0600 Ecology of Hong Kong 6 BIOL0604 Evolutionary diversity 6 BIOL0625 Ecology and evolution 6

## 2. Advanced level courses (48 credits)

BIOL2608 Biometrics 6 (note 2)

BIOL2611 Systematics & phylogenetics 6 BIOL2612 Conservation ecology 6

Plus at least 30 credits of the following courses (note 1):

BIOL2210 Evolution 6 BIOL2606 Environmental microbiology 6 BIOL2607 Fish biology 6 BIOL2610 Biological oceanography OR Marine biology 6 BIOL2615 Freshwater ecology 6 BIOL2617 Coastal ecology 0R Experimental intertidal ecology 6 BIOL2619 Terrestrial ecology 6 BIOL2621 Plant structure and evolution 6 BIOL2622 The biology of marine mammals 6 BIOL2625 Animal behaviour 6 BIOL3621 Fisheries and mariculture 6 BIOL3622 Ecological impact assessment 6

## 3. Experiential learning requirement (6 credits) \*

Students must take at least one of the following forms of extra-ordinary learning experience to fulfill the experiential learning requirement:

- BIOL2318 Biological sciences field course 6
- BIOL2320 Directed studies in biological sciences 6
- BIOL3321 Biological sciences project 12
- BIOL3988 Biological sciences internship 6
- SCNC2005 Career development for science students (non-credit bearing)
- SCNC2988 Service learning internship (non-credit bearing)

- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)

- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (noncredit bearing)

\* If the extra-ordinary learning experience is fulfilled by non-credit bearing activities, students must take an additional 6-credit advanced level biological sciences course (BIOL2XXX or BIOL3XXX level). Students are not required to take EL if this Science major is taken as a second major but a 6-credit advanced level course in the second major must be taken to fulfill the credit requirement.

## Notes:

1. Students who wish to specialize in a certain area are recommended to choose courses from the following lists. (a) For students who are interested in ecology & evolution: BIOL2210, BIOL2606, BIOL2615, BIOL2617, BIOL2619, BIOL2621.

(b) For students who are interested in marine biology: BIOL2607, BIOL2610, BIOL2617, BIOL2622, BIOL3621. 2. Not available in 2012-2013 or thereafter.

## Remarks:

#### Major Title

Major in Ecology & Biodiversity

Offered to students admitted to Year 1 in 2010-2011

#### **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 a first year-core, which emphasizes plant and animal biology and includes a compulsory week-long residential field trip. The second and third year of the major teaches students about the ecology and biodiversity of different ecosystems (e.g. marine 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 of biodiversity scientists or conservation biologists.

## Learning Outcomes:

a. 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) b. understand and appreciate the variety of life in Hong Kong's and Southeast Asia's natural habitats, and become equipped to understand, study, manage and protect that diversity;

(by means of coursework, laboratory-based, tutorial classes and/or project-based learning in the curriculum) c. 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) d. are able to 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) e. 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)

f. 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)

g. are motivated and sufficiently equipped to be able to apply the knowledge solve local, regional and global environmental problems.

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

#### **Minimum Entry Requirement:** NIL

#### **Minimum Credit Requirement:**

72 credits (18 credits introductory level, 54 credits advanced level courses including experiential learning requirement)

## Impermissible Combination:

Minor in Ecology & Biodiversity

## **Required courses (72 credits)**

## 1. Introductory level courses (18 credits)

BIOL0600 Ecology of Hong Kong 6 BIOL0604 Evolutionary diversity 6 BIOL0625 Ecology and evolution 6

## 2. Advanced level courses (48 credits)

BIOL2608 Biometrics 6 (note 2)

BIOL2611 Systematics & phylogenetics 6 BIOL2612 Conservation ecology 6

Plus at least 30 credits of the following courses (note 1):

BIOL2210 Evolution 6 BIOL2606 Environmental microbiology 6 BIOL2607 Fish biology 6 BIOL2610 Biological oceanography OR Marine biology 6 BIOL2615 Freshwater ecology 6 BIOL2617 Coastal ecology 0R Experimental intertidal ecology 6 BIOL2619 Terrestrial ecology 6 BIOL2621 Plant structure and evolution 6 BIOL2622 The biology of marine mammals 6 BIOL2625 Animal behaviour 6 BIOL3621 Fisheries and mariculture 6 BIOL3622 Ecological impact assessment 6

## 3. Experiential learning requirement (6 credits) \*

Students must take at least one of the following forms of extra-ordinary learning experience to fulfill the experiential learning requirement:

- BIOL2318 Biological sciences field course 6
- BIOL2320 Directed studies in biological sciences 6
- BIOL3321 Biological sciences project 12
- BIOL3988 Biological sciences internship 6
- SCNC2005 Career development for science students (non-credit bearing)
- SCNC2988 Service learning internship (non-credit bearing)

- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)

- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (noncredit bearing)

\* If the extra-ordinary learning experience is fulfilled by non-credit bearing activities, students must take an additional 6-credit advanced level biological sciences course (BIOL2XXX or BIOL3XXX level). Students are not required to take EL if this Science major is taken as a second major but a 6-credit advanced level course in the second major must be taken to fulfill the credit requirement.

## Notes:

1. Students who wish to specialize in a certain area are recommended to choose courses from the following lists. (a) For students who are interested in ecology & evolution: BIOL2210, BIOL2606, BIOL2615, BIOL2617, BIOL2619, BIOL2621.

(b) For students who are interested in marine biology: BIOL2607, BIOL2610, BIOL2617, BIOL2622, BIOL3621. 2. Not available in 2012-2013 or thereafter.

## Remarks:

#### Major Title

Major in Ecology & Biodiversity

Offered to students admitted to Year 1 in

2009-2010

#### **Objectives:**

This major is directed at teaching students about the 'rules of existence' for organisms in nature. 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. Considerable emphasis is placed on the use of IT and student centred learning through the Learning Support Centre of the Division of Ecology & Biodiversity. This major is based around a first year-core, which emphasizes plant and animal biology and includes a compulsory weeklong residential field trip. The second and third year of the major teaches students about the ecology and biodiversity of different ecosystems (e.g. marine 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. In addition, students can conduct either a small research project or produce a dissertation under the close supervision of individual staff members. 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 environmental sector. Biodiversity conservation requires scientific input as well as passion. Through the range of formal field-based courses as well as extracurricular 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 of biodiversity scientists or conservation biologists.

## Learning Outcomes:

a. understand and appreciate the major living and non-living components of the regional and global environment, and how they interact; identify of the 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)

b. understand and appreciate the variety of life in Hong Kong's natural habitats, and equipped to understand, study, manage and protect that diversity;

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

c. have sufficient experience of the basic techniques of modern ecological science to prepare to learn new ones for specific tasks;

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

d. are able to 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)

e. demonstrate of 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)

f. have the skill and knowledge to pursue postgraduate ecological research or to develop their careers 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)

g. are motivated and sufficiently equipped to be able to apply the knowledge solve local, regional and global environmental problems.

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

## Minimum Entry Requirement:

NIL

#### Minimum Credit Requirement:

72 credits (18 credits introductory level, 54 credits advanced level courses including experiential learning requirement)

#### Impermissible Combination: Minor in Ecology & Biodiversity

Required courses (72 credits)

1. Introductory level courses (18 credits)

## Science Majors

BIOL0601 Ecology of Hong Kong (note 3) (3) OR BIOL0600 Ecology of Hong Kong 6 BIOL0604 Evolutionary diversity 6 BIOL0605 Ecology field course (note 3) 3 BIOL0625 Ecology and evolution 6

The following introductory courses are recommended as electives: BIOL0126 Fundamentals of biology 6 BIOL1133 Biological sciences laboratory course 6 CHEM1009 Basic chemistry 6 EASC0105 Earth through time 6

## 2. Advanced level courses (48 credits)

BIOL2608 Biometrics 6 (note 2) BIOL2611 Systematics & phylogenetics 6 BIOL2612 Conservation biology OR Conservation ecology 6

Plus at least 30 credits of the following courses (note 1):

BIOL2210 Evolution 6 BIOL2606 Environmental microbiology 6 BIOL2607 Fish biology 6 BIOL2610 Biological oceanography OR Marine biology 6 BIOL2615 Freshwater ecology 6 BIOL2616 Plant structure and evolution (note 3) (3) OR BIOL2621 Plant structure and evolution 6 BIOL2617 Coastal ecology OR Experimental intertidal ecology 6 BIOL2619 Terrestrial ecology 6 BIOL3621 Fisheries and mariculture 6

## 3. Experiential learning requirement (6 credits) \*

Students must take at least one of the following forms of extra-ordinary learning experience to fulfill the experiential learning requirement:

- BIOL2318 Biological sciences field course 6

- BIOL2320 Directed studies in biological sciences 6
- BIOL3321 Biological sciences project 12
- BIOL3988 Biological sciences internship 6
- SCNC2005 Career development for science students (non-credit bearing)
- SCNC2988 Service learning internship (non-credit bearing)
- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)

- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (noncredit bearing)

\* If the extra-ordinary learning experience is fulfilled by non-credit bearing activities, students must take an additional 6-credit advanced level biological sciences course (BIOL2XXX or BIOL3XXX level). Students are not required to take EL if this Science major is taken as a second major but a 6-credit advanced level course in the second major must be taken to fulfill the credit requirement.

#### Notes:

1. Students who wish to specialize in a certain area are recommended to choose courses from the following lists. (a) For students who are interested in ecology & evolution: BIOL2210, BIOL2606, BIOL2615, BIOL2616/BIOL2621, BIOL2617, BIOL2619.

(b) For students who are interested in marine biology: BIOL2607, BIOL2610, BIOL2617, BIOL3621.

- 2. Not available in 2012-2013 or thereafter.
- 3. Not available in 2010-2011 or thereafter.

#### **Remarks:**

Major in Environmental Science

2012-2013

Offered to students admitted to Year 1 in

#### **Objectives:**

The Environmental Science curriculum in the Faculty of 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:

a. Knowledge to identify and describe the nature, and context of key issues in environmental science; (by means of lectures, coursework, and tutorial classes in the curriculum)

b. Knowledge to use and to critically analyze a range of forms and sources of environmental data; (by means of lectures, coursework and laboratory-based learning in the curriculum)

c. Skills to observe, describe, measure and analyze physical, biological and chemical characteristics of natural and man-made environments;

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

d. Advanced level of ability in scientific inquiry and effective communications. (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)

# Minimum Entry Requirement: NIL

## Minimum Credit Requirement:

78 credits (24 credits introductory level, 54 credits advanced level courses including experiential learning requirement)

#### Impermissible Combination: Nil

NII

## Required courses (78 credits)

## 1. Introductory level courses (24 credits)

ENVS0001 Introduction to environmental science 6

Plus 18 credits of the following courses:

ENVS1002 Environmental life science OR BIOL0126 Fundamentals of biology 6 CHEM0008 Fundamental chemistry OR CHEM1009 Basic chemistry 6 EASC0118 Blue planet 6 PHYS0625 Physics by inquiry OR PHYS1417 Basic physics 6

## 2. Advanced level courses (48 credits) (note 1)

To meet the interdisciplinary objectives of the Environmental Science major and foster the development of transferable skills, students must take a minimum of two courses from 3 of the following 4 key areas. The key areas that are suggested in order to help prepare students for potential career pathways.

Area 1: Life and Environment

This area includes courses on Earth's ecological environment and biological resources.

BIOL2606 Environmental microbiology 6 BIOL2610 Marine biology 6 BIOL2612 Conservation ecology 6 BIOL2615 Freshwater ecology 6 BIOL2617 Experimental intertidal ecology 6 BIOL2619 Terrestrial ecology 6 BIOL3621 Fisheries and mariculture 6 ENVS2003 Demographic principles in ecology and evolution 6 ENVS2012 Global change ecology 6 ENVS3013 Ecological demography in changing environments 6

Area 2: Physical and Sustainable Environment

This area includes courses related to the Earth's physical environment, climatic changes, and energy, water and mineral resources.

EASC2113 Sedimentology 6 EASC2127 Global change: anthropogenic impact 6 EASC2131 A cool world: ice ages and climate change 6 EASC3132 Earth resources 6 ENVS2007 Natural hazards and mitigation 6 ENVS2010 Sustainable energy and environment 6 ENVS2013 Environmental Oceanography 6

Area 3: Pollution and Remediation

This area includes courses related to the chemical environment, anthropogenic hazards, air and water quality and waste management.

BIOL2614 Environmental toxicology 6 CHEM2102 Environmental chemistry 6 CHEM2103 Chemical process industries and analysis 6 CHEM2202 Chemical instrumentation 6 CHEM2207 Food and water analysis 6 CHEM2510 Principles and applications of spectroscopic and analytical techniques 6 ENVS2006 Environmental radiation 6 ENVS2008 Pollution 6 ENVS2009 Remediation 6

Area 4: Monitoring and Management

This area includes courses that deal with data and risk analysis, modeling, environmental planning and policies.

BIOL3622 Ecological impact assessment 6 ENVS2004 Environment and society 6 ENVS3014 Environmental risk assessment and management 6 MATH2408 Computational methods and differential equations with applications 6 STAT2311 Computer-aided data analysis 6

## 3. Experiential learning requirement (6 credits) \*

Students must take at least one of the following forms of extra-ordinary learning experience to fulfill the experiential learning requirement:

ENVS2011 Directed studies in environmental science 6 ENVS3015 Environmental science project 12 ENVS3016 Environmental science in practice 6

Other experiential learning courses/activities are also available as electives:

- ENVS3988 Environmental science internship 6

- SCNC2005 Career development for science students (non-credit bearing)

- SCNC2988 Service learning internship (non-credit bearing)

- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)

- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (noncredit bearing)

\* Students are not required to take EL if this Science major is taken as a second major but a 6-credit advanced level course in the second major must be taken to fulfill the credit requirement.

## Notes:

1. Availability of the advanced level courses is subject to change.

Major in Environmental Science

2011-2012

Offered to students admitted to Year 1 in

#### **Objectives:**

The Environmental Science curriculum in the Faculty of 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:

a. Knowledge to identify and describe the nature, and context of key issues in environmental science; (by means of lectures, coursework, and tutorial classes in the curriculum)

b. Knowledge to use and to critically analyze a range of forms and sources of environmental data; (by means of lectures, coursework and laboratory-based learning in the curriculum)

c. Skills to observe, describe, measure and analyze physical, biological and chemical characteristics of natural and man-made environments;

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

d. Advanced level of ability in scientific inquiry and effective communications. (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)

# Minimum Entry Requirement: NIL

## Minimum Credit Requirement:

78 credits (24 credits introductory level, 54 credits advanced level courses including experiential learning requirement)

#### Impermissible Combination: Nil

NII

## Required courses (78 credits)

## 1. Introductory level courses (24 credits)

ENVS0001 Introduction to environmental science 6

Plus 18 credits of the following courses:

ENVS1002 Environmental life science OR BIOL0126 Fundamentals of biology 6 CHEM0008 Fundamental chemistry OR CHEM1009 Basic chemistry 6 EASC0118 Blue planet 6 PHYS0625 Physics by inquiry OR PHYS1417 Basic physics 6

## 2. Advanced level courses (48 credits) (note 1)

To meet the interdisciplinary objectives of the Environmental Science major and foster the development of transferable skills, students must take a minimum of two courses from 3 of the following 4 key areas. The key areas that are suggested in order to help prepare students for potential career pathways.

Area 1: Life and Environment

This area includes courses on Earth's ecological environment and biological resources.

BIOL2606 Environmental microbiology 6 BIOL2610 Biological oceanography OR Marine biology 6 BIOL2612 Conservation ecology 6 BIOL2615 Freshwater ecology 6 BIOL2617 Coastal ecology OR Experimental intertidal ecology 6 BIOL2619 Terrestrial ecology 6 BIOL3621 Fisheries and mariculture 6 ENVS2003 Demographic principles in ecology and evolution OR Demographic principles in population and evolutionary biology 6 ENVS2012 Global change ecology 6 ENVS3013 Ecological demography in changing environments 6

Area 2: Physical and Sustainable Environment

This area includes courses related to the Earth's physical environment, climatic changes, and energy, water and mineral resources.

EASC2113 Sedimentology 6 EASC2127 Global change: anthropogenic impact 6 EASC2131 A cool world: ice ages and climate change 6 EASC3132 Earth resources 6 ENVS2007 Natural hazards and mitigation 6 ENVS2010 Sustainable energy and environment 6 ENVS2013 Environmental Oceanography 6

Area 3: Pollution and Remediation

This area includes courses related to the chemical environment, anthropogenic hazards, air and water quality and waste management.

BIOL2614 Environmental toxicology 6 CHEM2102 Environmental chemistry 6 CHEM2103 Chemical process industries and analysis 6 CHEM2202 Chemical instrumentation 6 CHEM2207 Food and water analysis 6 CHEM2510 Principles and applications of spectroscopic and analytical techniques 6 ENVS2006 Environmental radiation 6 ENVS2008 Pollution 6 ENVS2009 Remediation 6

Area 4: Monitoring and Management

This area includes courses that deal with data and risk analysis, modeling, environmental planning and policies.

BIOL2608 Biometrics (note 2) 6 BIOL3622 Ecological impact assessment 6 ENVS2004 Environment and society 6 ENVS3014 Environmental risk assessment and management 6 MATH2408 Computational methods and differential equations with applications 6 STAT2311 Computer-aided data analysis 6

## 3. Experiential learning requirement (6 credits) \*

Students must take at least one of the following forms of extra-ordinary learning experience to fulfill the experiential learning requirement:

ENVS2011 Directed studies in environmental science 6 ENVS3015 Environmental science project 12 ENVS3016 Environmental science in practice 6

Other experiential learning courses/activities are also available as electives:

- ENVS3988 Environmental science internship 6

- SCNC2005 Career development for science students (non-credit bearing)

- SCNC2988 Service learning internship (non-credit bearing)

- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)

- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (noncredit bearing)

\* Students are not required to take EL if this Science major is taken as a second major but a 6-credit advanced level course in the second major must be taken to fulfill the credit requirement.

Availability of the advanced level courses is subject to change.
 Not available in 2012-2013 or thereafter.

## **Remarks:**

Major	Title
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Major in Environmental Science

2010-2011

Offered to students admitted to Year 1 in

#### **Objectives:**

The Environmental Science curriculum in the Faculty of 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:

a. Knowledge to identify and describe the nature, and context of key issues in environmental science; (by means of lectures, coursework, and tutorial classes in the curriculum)

b. Knowledge to use and to critically analyze a range of forms and sources of environmental data; (by means of lectures, coursework and laboratory-based learning in the curriculum)

c. Skills to observe, describe, measure and analyze physical, biological and chemical characteristics of natural and man-made environments;

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

d. Advanced level of ability in scientific inquiry and effective communications. (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)

# Minimum Entry Requirement: NIL

## Minimum Credit Requirement:

78 credits (24 credits introductory level, 54 credits advanced level courses including experiential learning requirement)

#### Impermissible Combination: Nil

NII

## Required courses (78 credits)

## 1. Introductory level courses (24 credits)

ENVS0001 Introduction to environmental science 6

Plus 18 credits of the following courses:

ENVS1002 Environmental life science OR BIOL0126 Fundamentals of biology 6 CHEM0008 Fundamental chemistry OR CHEM1009 Basic chemistry 6 EASC0118 Blue planet 6 PHYS0625 Physics by inquiry OR PHYS1417 Basic physics 6

## 2. Advanced level courses (48 credits) (note 1)

To meet the interdisciplinary objectives of the Environmental Science major and foster the development of transferable skills, students must take a minimum of two courses from 3 of the following 4 key areas. The key areas that are suggested in order to help prepare students for potential career pathways.

Area 1: Life and Environment

This area includes courses on Earth's ecological environment and biological resources.

BIOL2606 Environmental microbiology 6 BIOL2610 Biological oceanography OR Marine biology 6 BIOL2612 Conservation ecology 6 BIOL2615 Freshwater ecology 6 BIOL2617 Coastal ecology OR Experimental intertidal ecology 6 BIOL2619 Terrestrial ecology 6 BIOL3621 Fisheries and mariculture 6 ENVS2003 Demographic principles in ecology and evolution OR Demographic principles in population and evolutionary biology 6 ENVS2012 Global change ecology 6 ENVS3013 Ecological demography in changing environments 6

Area 2: Physical and Sustainable Environment

This area includes courses related to the Earth's physical environment, climatic changes, and energy, water and mineral resources.

EASC2113 Sedimentology 6 EASC2127 Global change: anthropogenic impact 6 EASC2129 Physical oceanography 6 (note 2) OR ENVS2013 Environmental oceanography 6 EASC2131 A cool world: ice ages and climate change 6 EASC3132 Earth resources 6 ENVS2007 Natural hazards and mitigation 6 ENVS2010 Sustainable energy and environment 6

Area 3: Pollution and Remediation

This area includes courses related to the chemical environment, anthropogenic hazards, air and water quality and waste management.

BIOL2614 Environmental toxicology 6 CHEM2102 Environmental chemistry 6 CHEM2103 Chemical process industries and analysis 6 CHEM2202 Chemical instrumentation 6 CHEM2207 Food and water analysis 6 CHEM2510 Principles and applications of spectroscopic and analytical techniques 6 ENVS2006 Environmental radiation 6 ENVS2008 Pollution 6 ENVS2009 Remediation 6

Area 4: Monitoring and Management

This area includes courses that deal with data and risk analysis, modeling, environmental planning and policies.

BIOL2608 Biometrics (note 3) 6 BIOL3622 Ecological impact assessment 6 EASC2130 Earth observation and remote sensing 6 ENVS2004 Environment and society 6 ENVS3012 Business, economics and the environment 6 ENVS3014 Environmental risk assessment and management 6 MATH2408 Computational methods and differential equations with applications 6 MATH2901 Operations research I 6 STAT2311 Computer-aided data analysis 6

## 3. Experiential learning requirement (6 credits) \*

Students must take at least one of the following forms of extra-ordinary learning experience to fulfill the experiential learning requirement:

ENVS2011 Directed studies in environmental science 6 ENVS3015 Environmental science project 12 ENVS3016 Environmental science in practice 6

Other experiential learning courses/activities are also available as electives:

- ENVS3988 Environmental science internship 6

- SCNC2005 Career development for science students (non-credit bearing)
- SCNC2988 Service learning internship (non-credit bearing)

- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)

- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (noncredit bearing) \* Students are not required to take EL if this Science major is taken as a second major but a 6-credit advanced level course in the second major must be taken to fulfill the credit requirement.

#### Notes:

- 1. Availability of the advanced level courses is subject to change.
- 2. Not available in 2011-2012 or thereafter.
- 3. Not available in 2012-2013 or thereafter.

#### **Remarks:**

#### Major Title

Major in Environmental Science

2009-2010

Offered to students admitted to Year 1 in

#### **Objectives:**

The Environmental Science curriculum in the Faculty of 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:

a. Knowledge to identify and describe the nature, and context of key issues in environmental science; (by means of lectures, coursework, and tutorial classes in the curriculum)

b. Knowledge to use and to critically analyze a range of forms and sources of environmental data; (by means of lectures, coursework and laboratory-based learning in the curriculum)

c. Skills to observe, describe, measure and analyze physical, biological and chemical characteristics of natural and man-made environments;

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

d. Advanced level of ability in scientific inquiry and effective communications. (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)

# Minimum Entry Requirement: NIL

## **Minimum Credit Requirement:**

78 credits (24 credits introductory level, 54 credits advanced level courses including experiential learning requirement)

#### Impermissible Combination: Nil

NII

## Required courses (78 credits)

## 1. Introductory level courses (24 credits)

ENVS0001 Introduction to environmental science 6

Plus 18 credits of the following courses:

ENVS1002 Environmental life science OR BIOL0126 Fundamentals of biology 6 CHEM0008 Fundamental chemistry OR CHEM1009 Basic chemistry 6 EASC0118 Blue planet 6 PHYS0625 Physics by inquiry OR PHYS1417 Basic physics 6

## 2. Advanced level courses (48 credits) (note 1)

To meet the interdisciplinary objectives of the Environmental Science major and foster the development of transferable skills, students must take a minimum of two courses from 3 of the following 4 key areas. The key areas that are suggested in order to help prepare students for potential career pathways.

Area 1: Life and Environment

This area includes courses on Earth's ecological environment and biological resources.

BIOL2606 Environmental microbiology 6 BIOL2610 Biological oceanography OR Marine biology 6 BIOL2612 Conservation ecology 6 BIOL2615 Freshwater ecology 6 BIOL2617 Coastal ecology OR Experimental intertidal ecology 6 BIOL2619 Terrestrial ecology 6 BIOL3621 Fisheries and mariculture 6 ENVS2003 Demographic principles in ecology and evolution OR Demographic principles in population and evolutionary biology 6 ENVS2012 Global change ecology 6 ENVS3013 Ecological demography in changing environments 6

Area 2: Physical and Sustainable Environment

This area includes courses related to the Earth's physical environment, climatic changes, and energy, water and mineral resources.

EASC2113 Sedimentology 6 EASC2127 Global change: anthropogenic impact 6 EASC2129 Physical oceanography 6 (note 2) OR ENVS2013 Environmental oceanography 6 EASC2131 A cool world: ice ages and climate change 6 EASC3132 Earth resources 6 ENVS2007 Natural hazards and mitigation 6 ENVS2010 Sustainable energy and environment 6

Area 3: Pollution and Remediation

This area includes courses related to the chemical environment, anthropogenic hazards, air and water quality and waste management.

BIOL2614 Environmental toxicology 6 CHEM2102 Environmental chemistry 6 CHEM2103 Chemical process industries and analysis 6 CHEM2202 Chemical instrumentation 6 CHEM2207 Food and water analysis 6 CHEM2510 Principles and applications of spectroscopic and analytical techniques 6 ENVS2006 Environmental radiation 6 ENVS2008 Pollution 6 ENVS2009 Remediation 6

Area 4: Monitoring and Management

This area includes courses that deal with data and risk analysis, modeling, environmental planning and policies.

BIOL2608 Biometrics (note 3) 6 BIOL3622 Ecological impact assessment 6 EASC2130 Earth observation and remote sensing 6 ENVS2004 Environment and society 6 ENVS3012 Business, economics and the environment 6 ENVS3014 Environmental risk assessment and management 6 MATH2408 Computational methods and differential equations with applications 6 MATH2901 Operations research I 6 STAT2311 Computer-aided data analysis 6

## 3. Experiential learning requirement (6 credits) \*

Students must take at least one of the following forms of extra-ordinary learning experience to fulfill the experiential learning requirement:

ENVS2011 Directed studies in environmental science 6 ENVS3015 Environmental science project 12 ENVS3016 Environmental science in practice 6

Other experiential learning courses/activities are also available as electives:

- ENVS3988 Environmental science internship 6

- SCNC2005 Career development for science students (non-credit bearing)
- SCNC2988 Service learning internship (non-credit bearing)

- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)

- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (noncredit bearing) \* Students are not required to take EL if this Science major is taken as a second major but a 6-credit advanced level course in the second major must be taken to fulfill the credit requirement.

#### Notes:

- 1. Availability of the advanced level courses is subject to change.
- 2. Not available in 2011-2012 or thereafter.
- 3. Not available in 2012-2013 or thereafter.

#### **Remarks:**

Major Title

Major in Food & Nutritional Science

2012-2013

Offered to students admitted to Year 1 in

#### **Objectives:**

Objectives : The Food and Nutritional Science Major at the University of Hong Kong 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) A detailed critical knowledge and understanding of the theoretical and practical aspects of food science and technology and nutrition and their relationship to human health.

(b) A 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 M.Phil 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 program 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, designed to enhance the student's 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 majoring in this program 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:

a. 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)

b. Discuss 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)

c. 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)

d. 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)

e. 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)

f. Demonstrate teamwork skills necessary to working in a multi-disciplinary environment. (by means of coursework and group-project learning in the curriculum)

## Minimum Entry Requirement:

AL Biology or equivalent or a pass in BIOL0126 Fundamentals of biology and AL / AS Chemistry or equivalent or a pass in CHEM0008 Fundamental chemistry

## Minimum Credit Requirement:

72 credits (18 credits introductory level, 54 credits advanced level courses including experiential learning requirement)

## Impermissible Combination:

Minor in Food & Nutritional Science

#### Required courses (72 credits)

## 1. Introductory level courses (18 credits)

BIOL1125 Introduction to biochemistry OR CHEM1401 Fundamentals of organic chemistry 6 BIOL1514 Nutrition and metabolism 6 BIOL1528 Food chemistry 6 Alternative course possible in the case of students taking Majors / Minors with an overlap of core courses:

BIOL1122 Functional biology 6

#### 2. Advanced level courses (48 credits) (note 1)

BIOL2535 Food processing and engineering laboratory course 6 BIOL2536 Food and nutrients analysis laboratory course 6

Plus at least 36 credits of the following courses:

BIOL2218 Human physiology 6 BIOL2302 Fermentation technology 6 BIOL2503 Grain production & utilization 6 BIOL2507 Meat and dairy science 6 BIOL2515 Food microbiology 6 BIOL2530 Molecular biology and nutrigenomics 6 BIOL2532 Diet and disease 6 BIOL2533 Nutrition and life cycle 6 BIOL2534 Nutrition and public health 6 BIOL2538 Nutraceuticals and functional foods BIOL2540 Food and nutritional toxicology 6 BIOL3527 Food safety and quality management 6 BIOL3538 Food product development 6 BIOL3540 Diet, brain function and behaviour 6 PBSL2229 Exercise physiology 6

#### 3. Experiential learning requirement (6 credits) \*

Students must take at least one of the following forms of extra-ordinary learning experience to fulfill the experiential learning requirement:

- BIOL2318 Biological sciences field course 6

- BIOL2320 Directed studies in biological sciences 6

- BIOL3321 Biological sciences project 12

- BIOL3988 Biological sciences internship 6

- SCNC2005 Career development for science students (non-credit bearing)
- SCNC2988 Service learning internship (non-credit bearing)

- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)

- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (noncredit bearing)

\* If the extra-ordinary learning experience is fulfilled by non-credit bearing activities, students must take an additional 6-credit advanced level biological sciences course (BIOL2XXX or BIOL3XXX level). Students are not required to take EL if this Science major is taken as a second major but a 6-credit advanced level course in the second major must be taken to fulfill the credit requirement.

#### Notes:

1 Students who wish to specialize in a certain area are recommended to choose courses from the following lists: (a) Food Science and Technology: BIOL2302, BIOL2503, BIOL2507, BIOL2515, BIOL2535, BIOL2536, BIOL3527, BIOL3538.

(b) Nutrition and Health Science: BIOL2218, BIOL2540, BIOL2530, BIOL2532, BIOL2533, BIOL2534, BIOL2536, BIOL3540, PBSL2229.

(c) Food Safety and Toxicology: BIOL2218, BIOL2515, BIOL2540, BIOL2536, BIOL3527.

#### **Remarks:**

Major Title

Major in Food & Nutritional Science

Offered to students admitted to Year 1 in

2011-2012

#### **Objectives:**

Objectives : The Food and Nutritional Science Major at the University of Hong Kong 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) A detailed critical knowledge and understanding of the theoretical and practical aspects of food science and technology and nutrition and their relationship to human health.

(b) A 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 M.Phil 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 program 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, designed to enhance the student's 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 majoring in this program 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:

a. 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)

b. Discuss 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)

c. 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)

d. 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)

e. 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)

f. Demonstrate teamwork skills necessary to working in a multi-disciplinary environment. (by means of coursework and group-project learning in the curriculum)

## Minimum Entry Requirement:

AL Biology or equivalent or a pass in BIOL0126 Fundamentals of biology and AL / AS Chemistry or equivalent or a pass in CHEM0008 Fundamental chemistry

## Minimum Credit Requirement:

72 credits (18 credits introductory level, 54 credits advanced level courses including experiential learning requirement)

## Impermissible Combination:

Minor in Food & Nutritional Science

#### Required courses (72 credits)

## 1. Introductory level courses (18 credits)

BIOL1125 Introduction to biochemistry OR CHEM1401 Fundamentals of organic chemistry 6 BIOL1514 Nutrition and metabolism 6 BIOL1528 Food chemistry 6 Alternative course possible in the case of students taking Majors / Minors with an overlap of core courses:

BIOL1122 Functional biology 6

#### 2. Advanced level courses (48 credits) (note 1)

At least 12 credits of the following courses:

BIOL2535 Food processing and engineering laboratory course 6 BIOL2536 Food and nutrients analysis laboratory course 6 BIOL2537 Laboratory in nutritional science 6 BIOL3541 Advances in food toxicology 6

Plus at least 36 credits of the following courses:

BIOL2218 Human physiology 6 BIOL2302 Fermentation technology 6 BIOL2503 Grain production & utilization 6 BIOL2507 Meat and dairy science 6 BIOL2515 Food microbiology 6 BIOL2530 Molecular biology and nutrigenomics 6 BIOL2531 Principles of Chinese medicinal diet 6 BIOL2532 Diet and disease 6 BIOL2533 Nutrition and life cycle 6 BIOL2534 Nutrition and public health 6 **BIOL2538 Nutraceuticals and functional foods** BIOL2540 Basics of Toxicology OR Food and nutritional toxicology 6 BIOL3527 Food safety and quality management 6 BIOL3538 Food product development 6 BIOL3540 Diet, brain function and behaviour 6 PBSL2229 Exercise physiology 6

#### 3. Experiential learning requirement (6 credits) \*

Students must take at least one of the following forms of extra-ordinary learning experience to fulfill the experiential learning requirement:

- BIOL2318 Biological sciences field course 6

- BIOL2320 Directed studies in biological sciences 6
- BIOL3321 Biological sciences project 12
- BIOL3988 Biological sciences internship 6
- SCNC2005 Career development for science students (non-credit bearing)
- SCNC2988 Service learning internship (non-credit bearing)

- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)

- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (noncredit bearing)

\* If the extra-ordinary learning experience is fulfilled by non-credit bearing activities, students must take an additional 6-credit advanced level biological sciences course (BIOL2XXX or BIOL3XXX level). Students are not required to take EL if this Science major is taken as a second major but a 6-credit advanced level course in the second major must be taken to fulfill the credit requirement.

#### Notes:

1 Students who wish to specialize in a certain area are recommended to choose courses from the following lists: (a) Food Science and Technology: BIOL2302, BIOL2503, BIOL2507, BIOL2515, BIOL2535, BIOL2536, BIOL3527, BIOL3538, BIOL3541.

(b) Nutrition and Health Science: BIOL2218, BIOL2540, BIOL2530, BIOL2531, BIOL2532, BIOL2533, BIOL2534, BIOL2536, BIOL2537, BIOL3540, PBSL2229.

(c) Food Safety and Toxicology: BIOL2218, BIOL2515, BIOL2540, BIOL2536, BIOL3527, BIOL3541.

## **Remarks:**

#### Major Title

Major in Food & Nutritional Science

2010-2011

Offered to students admitted to Year 1 in

## Objectives:

Objectives : The Food and Nutritional Science Major at the University of Hong Kong 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) A detailed critical knowledge and understanding of the theoretical and practical aspects of food science and technology and nutrition and their relationship to human health.

(b) A 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 M.Phil 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 program 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, designed to enhance the student's 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 majoring in this program 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:

a. 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)

b. Discuss 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)

c. 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)

d. 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)

e. 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)

f. Demonstrate teamwork skills necessary to working in a multi-disciplinary environment. (by means of coursework and group-project learning in the curriculum)

## Minimum Entry Requirement:

AL Biology or equivalent or a pass in BIOL0126 Fundamentals of biology and AL / AS Chemistry or equivalent or a pass in CHEM0008 Fundamental chemistry

#### Minimum Credit Requirement:

72 credits (18 credits introductory level, 54 credits advanced level courses including experiential learning requirement)

## Impermissible Combination:

Minor in Food & Nutritional Science

#### Required courses (72 credits)

## 1. Introductory level courses (18 credits)

BIOL1125 Introduction to biochemistry OR CHEM1401 Fundamentals of organic chemistry 6 BIOL1514 Nutrition and metabolism 6 BIOL1528 Food chemistry 6 Alternative course possible in the case of students taking Majors / Minors with an overlap of core courses:

BIOL1122 Functional biology 6

#### 2. Advanced level courses (48 credits) (note 1)

At least 12 credits of the following courses:

BIOL2535 Food processing and engineering laboratory course 6 BIOL2536 Food and nutrients analysis laboratory course 6 BIOL2537 Laboratory in nutritional science 6 BIOL3541 Advances in Food Toxicology

Plus at least 36 credits of the following courses:

BIOL2218 Human physiology 6 BIOL2302 Fermentation technology 6 BIOL2503 Grain production & utilization 6 BIOL2507 Meat and dairy science 6 BIOL2515 Food microbiology 6 BIOL2529 Food and nutritional toxicology OR BIOL2540 Basics of Toxicology OR Food and nutritional toxicology 6 BIOL2530 Molecular biology and nutrigenomics 6 BIOL2531 Principles of Chinese medicinal diet 6 BIOL2532 Diet and disease 6 BIOL2533 Nutrition and life cycle 6 BIOL2534 Nutrition and public health 6 **BIOL2538** Nutraceuticals and functional foods BIOL3527 Food safety and quality management 6 BIOL3538 Food product development 6 BIOL3540 Diet, brain function and behaviour 6 PBSL2229 Exercise physiology 6

#### 3. Experiential learning requirement (6 credits) \*

Students must take at least one of the following forms of extra-ordinary learning experience to fulfill the experiential learning requirement:

- BIOL2318 Biological sciences field course 6
- BIOL2320 Directed studies in biological sciences 6
- BIOL3321 Biological sciences project 12
- BIOL3988 Biological sciences internship 6
- SCNC2005 Career development for science students (non-credit bearing)
- SCNC2988 Service learning internship (non-credit bearing)

- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)

- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (noncredit bearing)

\* If the extra-ordinary learning experience is fulfilled by non-credit bearing activities, students must take an additional 6-credit advanced level biological sciences course (BIOL2XXX or BIOL3XXX level). Students are not required to take EL if this Science major is taken as a second major but a 6-credit advanced level course in the second major must be taken to fulfill the credit requirement.

#### Notes:

1 Students who wish to specialize in a certain area are recommended to choose courses from the following lists: (a) Food Science and Technology: BIOL2302, BIOL2503, BIOL2507, BIOL2515, BIOL2535, BIOL2536, BIOL3527, BIOL3538, BIOL3539 OR BIOL3541.

(b) Nutrition and Health Science: BIOL2218, BIOL2529 OR BIOL2540, BIOL2530, BIOL2531, BIOL2532, BIOL2533, BIOL2534, BIOL2536, BIOL2537, BIOL3540, PBSL2229.

(c) Food Safety and Toxicology: BIOL2218, BIOL2515, BIOL2529 OR BIOL2540, BIOL2536, BIOL3527, BIOL3539 OR BIOL3541.

#### Remarks:

#### Major Title

Major in Food & Nutritional Science

2009-2010

Offered to students admitted to Year 1 in

#### **Objectives:**

Objectives : The Food and Nutritional Science Major at the University of Hong Kong 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) A detailed critical knowledge and understanding of the theoretical and practical aspects of food science and technology and nutrition and their relationship to human health.

(b) A 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 M.Phil 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 program 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, designed to enhance the student's 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 majoring in this program 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:

a. 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)

b. Discuss 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)

c. 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)

d. 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)

e. 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)

f. Demonstrate teamwork skills necessary to working in a multi-disciplinary environment. (by means of coursework and group-project learning in the curriculum)

## Minimum Entry Requirement:

AL Biology or equivalent or a pass in BIOL0126 Fundamentals of biology and AL / AS Chemistry or equivalent or a pass in CHEM0008 Fundamental chemistry

## Minimum Credit Requirement:

72 credits (18 credits introductory level, 54 credits advanced level courses including experiential learning requirement)

## Impermissible Combination:

Minor in Food & Nutritional Science

#### Required courses (72 credits)

## 1. Introductory level courses (18 credits)

BIOL1125 Introduction to biochemistry OR CHEM1401 Fundamentals of organic chemistry 6 BIOL1514 Nutrition and metabolism 6 BIOL1528 Food chemistry 6 Alternative courses possible in the case of students taking Majors / Minors with an overlap of core courses:

BIOL0002 Introduction to food and nutritional science (note 2) 3 BIOL1122 Functional biology 6 (these courses are also strongly recommended as electives)

#### 2. Advanced level courses (48 credits) (note 1)

At least 12 credits of the following courses:

BIOL2535 Food processing and engineering laboratory course 6 BIOL2536 Food and nutrients analysis laboratory course 6 BIOL2537 Laboratory in nutritional science 6 BIOL3539 Food safety and toxicology laboratory course (note 3) OR BIOL3541 Advances in Food Toxicology 6

Plus at least 36 credits of the following courses:

BIOL2218 Human physiology 6 BIOL2302 Fermentation technology 6 BIOL2503 Grain production & utilization 6 BIOL2507 Meat and dairy science 6 BIOL2515 Food microbiology 6 BIOL2529 Food and nutritional toxicology OR BIOL2540 Basics of toxicology OR Food and nutritional toxicology 6 BIOL2530 Molecular biology and nutrigenomics 6 BIOL2531 Principles of Chinese medicinal diet 6 BIOL2532 Diet and disease 6 BIOL2533 Nutrition and life cycle 6 BIOL2534 Nutrition and public health 6 **BIOL2538** Nutraceuticals and functional foods BIOL3527 Food safety and quality management 6 BIOL3538 Food product development 6 BIOL3540 Diet, brain function and behaviour 6 PBSL2229 Exercise physiology 6 3. Experiential learning requirement (6 credits) \*

Students must take at least one of the following forms of extra-ordinary learning experience to fulfill the experiential learning requirement:

- BIOL2318 Biological sciences field course 6

- BIOL2320 Directed studies in biological sciences 6
- BIOL3321 Biological sciences project 12
- BIOL3988 Biological sciences internship 6
- SCNC2005 Career development for science students (non-credit bearing)
- SCNC2988 Service learning internship (non-credit bearing)

- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)

- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (noncredit bearing)

\* If the extra-ordinary learning experience is fulfilled by non-credit bearing activities, students must take an additional 6-credit advanced level biological sciences course (BIOL2XXX or BIOL3XXX level). Students are not required to take EL if this Science major is taken as a second major but a 6-credit advanced level course in the second major must be taken to fulfill the credit requirement.

#### Notes:

1 Students who wish to specialize in a certain area are recommended to choose courses from the following lists: (a) Food Science and Technology: BIOL2302, BIOL2503, BIOL2507, BIOL2515, BIOL2535, BIOL2536, BIOL3527, BIOL3538, BIOL3539 OR BIOL3541.

(b) Nutrition and Health Science: BIOL2218, BIOL2529 OR BIOL2540, BIOL2530, BIOL2531, BIOL2532, BIOL2533, BIOL2534, BIOL2536, BIOL2537, BIOL3540, PBSL2229.

(c) Food Safety and Toxicology: BIOL2218, BIOL2515, BIOL2529 OR BIOL2540, BIOL2536, BIOL3527, BIOL3539 OR BIOL3541.

2 Not available in 2010-2011 or thereafter.

3 Not available in 2011-2012 or thereafter.

Major Title	Major in Mathematics
Offered to students admitted to Year 1 in	2012-2013

#### **Objectives:**

The Mathematics Major provides the 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. 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 diverse variety of courses, 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, etc.

#### Learning Outcomes:

a. Students should be able to describe and present fundamental concepts in mathematics. (by means of coursework and learning activities in the major or minor curriculum)

b. Student should be able to apply mathematical theory and techniques to different areas of Sciences. (by means of coursework and learning activities in the major or minor curriculum)

c. Students should be able to communicate in mathematical language and present scientific arguments. (by means of coursework, seminars, guided studies and projects.)

d. Students should be able to collaborate and work with other students in an effective manner. (by means of guided studies, projects and seminars)

e. Students should be able to appreciate the beauty and power of mathematics. (by means of guided studies, projects and seminars)

#### **Minimum Entry Requirement:**

(note 1)

1. HKCEE Additional Mathematics and AS Mathematics and Statistics; or

2. AL Pure Mathematics; or

3. a pass in MATH0201 Basic calculus (for those with HKCEE Math only) or a pass in MATH1804 University mathematics A (for those with AS Math & Stat only)

#### Minimum Credit Requirement:

72 credits (18 credits introductory level, 54 credits advanced level courses including experiential learning requirement)

#### Impermissible Combination:

Major in Mathematics/Physics Minor in Mathematics

#### **Required courses (72 credits)**

## 1. Introductory level courses (18 credits)

MATH1001 Fundamental concepts of mathematics 6 MATH1111 Linear algebra 6 MATH1211 Multivariable calculus 6

## 2. Advanced level courses (48 credits)

MATH2201 Introduction to mathematical analysis 6 MATH2301 Algebra I 6 MATH2401 Analysis I 6 MATH2403 Functions of a complex variable 6

Plus at least 24 credits of advanced level Mathematics courses (MATH2XXX or MATH3XXX or MATH6XXX level), at least 12 credits of which should be from MATH3XXX or MATH6XXX level (note 2).

## 3. Experiential learning requirement (6 credits) \*

Students must take at least one of the following forms of extra-ordinary learning experience to fulfill the experiential learning requirement:

- MATH2002 Mathematics seminar (note 3) 6

- MATH2999 Directed studies in mathematics 6

- MATH3988 Mathematics internship 6

- MATH3999 Mathematics project 12

- SCNC2005 Career development for science students (non-credit bearing)

- SCNC2988 Service learning internship (non-credit bearing)

- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)

- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (noncredit bearing)

\* If the extra-ordinary learning experience is fulfilled by non-credit bearing activities, students must take an additional 6-credit advanced level mathematics course (MATH2XXX or MATH3XXX or MATH6XXX level). Students are not required to take EL if this Science major is taken as a second major but a 6-credit advanced level course in the second major must be taken to fulfill the credit requirement.

## Notes:

1. Students with different mathematics background must consult the Department of Mathematics for advice on the bridging courses.

2 Students who wish to specialize in a certain area are recommended to choose courses from the following lists.

(a) For students who are interested in pure mathematics: MATH2303, MATH2304, MATH2402, MATH2403, MATH3302, MATH3404, MATH3501.

(b) For students who are interested in computational mathematics, logistics, and/or operations research: MATH2303, MATH2600, MATH2601, MATH2603, MATH2901, MATH2904, MATH2905, MATH3602, MATH3902, MATH3903.

(c) For students who are interested in economics and finance, and plan to take some professional examinations in related fields: MATH2906, MATH2907, and non-mathematics courses BUSI1002, FINA1001, FINA2802, ECON0701, ECON2101, ECON2102.

3. MATH2002 is for first year BSc students only.

## **Remarks:**

Major Title	Major in Mathematics
Offered to students admitted to Year 1 in	2011-2012

#### **Objectives:**

The Mathematics Major provides the 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. 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 diverse variety of courses, 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, etc.

#### Learning Outcomes:

a. Students should be able to describe and present fundamental concepts in mathematics. (by means of coursework and learning activities in the major or minor curriculum)

b Student should be able to apply mathematical theory and techniques to different areas of Sciences. (by means of coursework and learning activities in the major or minor curriculum)

c. Students should be able to communicate in mathematical language and present scientific arguments. (by means of coursework, seminars, guided studies and projects.)

d. Students should be able to collaborate and work with other students in an effective manner. (by means of guided studies, projects and seminars)

e. Students should be able to appreciate the beauty and power of mathematics. (by means of guided studies, projects and seminars)

#### **Minimum Entry Requirement:**

(note 1)

1. HKCEE Additional Mathematics and AS Mathematics and Statistics; or

2. AL Pure Mathematics; or

3. a pass in MATH0201 Basic calculus (for those with HKCEE Math only) or a pass in MATH1804 University mathematics A (for those with AS Math & Stat only)

#### Minimum Credit Requirement:

72 credits (18 credits introductory level, 54 credits advanced level courses including experiential learning requirement)

#### Impermissible Combination:

Major in Mathematics/Physics Minor in Mathematics

#### Required courses (72 credits)

## 1. Introductory level courses (18 credits)

MATH1001 Fundamental concepts of mathematics 6 MATH1111 Linear algebra 6 MATH1211 Multivariable calculus 6

#### 2. Advanced level courses (48 credits)

MATH2201 Introduction to mathematical analysis 6 MATH2301 Algebra I 6 MATH2401 Analysis I 6

Plus at least 18 credits of the following courses (note 2):

MATH2304 Introduction to number theory 6 MATH2403 Functions of a complex variable 6 MATH2405 Differential equations 6 MATH2600 Discrete mathematics 6 MATH2601 Numerical analysis 6 MATH2603 Probability theory 6 MATH2901 Operational research I 6 MATH2904 Introduction to optimization 6 MATH2911 Game theory and strategy 6

Plus at least 12 credits of advanced level Mathematics courses (MATH2XXX or MATH3XXX or MATH6XXX level), subject to prerequisite requirements.

## 3. Experiential learning requirement (6 credits) \*

Students must take at least one of the following forms of extra-ordinary learning experience to fulfill the experiential learning requirement:

- MATH2002 Mathematics seminar (note 3) 6

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- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)

- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (noncredit bearing)

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a. Students should be able to describe and present fundamental concepts in mathematics. (by means of coursework and learning activities in the major or minor curriculum)

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Major Title	Major in Mathematics
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#### **Minimum Entry Requirement:**

(note 1)

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2. AL Pure Mathematics; or

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#### Minimum Credit Requirement:

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#### Impermissible Combination:

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#### 2. Advanced level courses (48 credits)

MATH2201 Introduction to mathematical analysis 6 MATH2301 Algebra I 6 MATH2401 Analysis I 6

Plus at least 18 credits of the following courses (note 2):

MATH2304 Introduction to number theory 6 MATH2403 Functions of a complex variable 6 MATH2405 Differential equations 6 MATH2600 Discrete mathematics 6 MATH2601 Numerical analysis 6 MATH2603 Probability theory 6 MATH2901 Operational research I 6 MATH2904 Introduction to optimization 6 MATH2911 Game theory and strategy 6

Plus at least 12 credits of advanced level Mathematics courses (MATH2XXX or MATH3XXX or MATH6XXX level), subject to prerequisite requirements.

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- SCNC2005 Career development for science students (non-credit bearing)

- SCNC2988 Service learning internship (non-credit bearing)

- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)

- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (noncredit bearing)

\* If the extra-ordinary learning experience is fulfilled by non-credit bearing activities, students must take an additional 6-credit advanced level mathematics course (MATH2XXX or MATH3XXX or MATH6XXX level). Students are not required to take EL if this Science major is taken as a second major but a 6-credit advanced level course in the second major must be taken to fulfill the credit requirement.

#### Notes:

1 Students with different mathematics background must consult the Department of Mathematics for advice on the bridging courses.

2 Students who wish to specialize in a certain area are recommended to choose courses from the following lists. (a) For students who are interested in pure mathematics: MATH2303, MATH2304, MATH2402, MATH2403, MATH3302, MATH3404, MATH3501.

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(c) For students who are interested in economics and finance, and plan to take some professional examinations in related fields: MATH2906, MATH2907, and non-mathematics courses BUSI1002, FINA1001, FINA2802, ECON0701, ECON2101, ECON2102.

3 MATH2002 is for first year BSc students only.

#### **Remarks:**

Major in Mathematics/Physics

2012-2013

Offered to students admitted to Year 1 in

#### **Objectives:**

The Major in Mathematics/Physics is aimed to provide students with a solid foundation in both the subjects of 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 emphases experiential learning through internships, field studies and research projects with experts and peers, etc. With the comprehensive training received, graduates are expected to be well-prepared to go on further studies and to pursue careers in many fields of science and engineering.

#### Learning Outcomes:

a. Students should be able to identify and describe physical systems with a rigorous representation using their professional knowledge.

(By means of coursework and tutorial classes in the curriculum)

b. Students should 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)

c. Students should be able to apply mathematical theory and techniques to analyze physical problems qualitatively and quantitatively.

(By means of coursework, tutorial classes and research-based projects in the curriculum)

d. Students should be able to communicate and collaborate with people effectively in scientific issues. (By means of group projects, tutorial sessions and presentation opportunities in the curriculum)

e. Students should be able to apply scientific and quantitative methods in tackling problems in research or realword setting.

(By means of projects, directed studies, local and foreign internships attached to universities, research centers, government bodies, NGOs and influential companies.)

## **Minimum Entry Requirement:**

(note 1)

1. AL / AS Physics or AL Engineering Science; and

2. HKCEE Additional Mathematics and AS Mathematics and Statistics, or AL Pure Mathematics; or

3. or a pass in PHYS0625 Physics by inquiry or equivalent and pass in MATH0201 Basic calculus (for those with HKCEE only) or a pass in MATH1804 University mathematics A (for those with AS Math & Stat only)

## Minimum Credit Requirement:

78 credits (24 credits introductory level, 54 credits advanced level courses including experiential learning requirement)

## Impermissible Combination:

Major in Mathematics; Physics Minor in Mathematics; Physics

## Required courses (78 credits) (note 2)

## 1. Introductory level courses (24 credits) (note 3)

MATH1111 Linear algebra 6 MATH1211 Multivariable calculus 6 PHYS1414 General physics I 6 PHYS1415 General physics II 6

## 2. Advanced level courses (48 credits) (note 4)

MATH2201 Introduction to mathematical analysis 6 MATH2301 Algebra I 6 MATH2403 Functions of a complex variable 6 MATH2405 Differential equations 6 PHYS2321 Introductory electromagnetism 6 PHYS2322 Statistical mechanics and thermodynamics 6 PHYS2626 Introductory classical mechanics 6 PHYS2627 Introductory quantum physics (note 5) 6

## 3. Experiential learning requirement (6 credits) \*

Students must take at least one of the following forms of extra-ordinary learning experience to fulfill the experiential learning requirement:

- MATH2002 Mathematics seminar (note 6) 6

- MATH2999 Directed studies in mathematics 6

- MATH3988 Mathematics internship 6

- MATH3999 Mathematics project 12
- PHYS2533 Directed studies in physics 6
- PHYS3531 Physics project 12
- PHYS3987 Quantitative tools in physics (non-credit bearing)
- PHYS3988 Physics internship 6
- SCNC2005 Career development for science students (non-credit bearing)
- SCNC2988 Service learning internship (non-credit bearing)

- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)

- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (noncredit bearing)

\* If the extra-ordinary learning experience is fulfilled by non-credit bearing activities, students must take an additional 6-credit advanced level mathematics / physics course (MATH2XXX or MATH3XXX or MATH6XXX or PHYS2XXX or PHYS6XXX level).

Students are not required to take EL if this Science major is taken as a second major but a 6-credit advanced level course in the second major must be taken to fulfill the credit requirement.

#### Notes:

1 Students with different mathematics background must consult the Department of Mathematics for advice on the bridging courses.

2 Students would have already satisfied requirements from Blocks A and B with this curriculum.

3 Students are recommended to take also MATH1001.

4 Students who intend to pursue further studies in Mathematics/Physics are recommended to take also MATH2401, MATH3501, PHYS3331, and PHYS3332.

5 Students may consider taking PHYS2627 as early as possible to allow for maximum flexibility in course selection for advanced level courses.

6 MATH2002 is for first year BSc students only.

## Remarks:

Major	Title
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Major in Mathematics/Physics

2011-2012

Offered to students admitted to Year 1 in

#### **Objectives:**

The Major in Mathematics/Physics is aimed to provide students with a solid foundation in both the subjects of 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 emphases experiential learning through internships, field studies and research projects with experts and peers, etc. With the comprehensive training received, graduates are expected to be well-prepared to go on further studies and to pursue careers in many fields of science and engineering.

#### Learning Outcomes:

a. Students should be able to identify and describe physical systems with a rigorous representation using their professional knowledge.

(By means of coursework and tutorial classes in the curriculum)

b. Students should have developed their scientific intuition, abilities and techniques to tackle physical problems with intellectual rigor theoretically.

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d. Students should be able to communicate and collaborate with people effectively in scientific issues. (By means of group projects, tutorial sessions and presentation opportunities in the curriculum)

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Major in Mathematics/Physics

2009-2010

Offered to students admitted to Year 1 in

#### **Objectives:**

The Major in Mathematics/Physics is aimed to provide students with a solid foundation in both the subjects of 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 emphases experiential learning through internships, field studies and research projects with experts and peers, etc. With the comprehensive training received, graduates are expected to be well-prepared to go on further studies and to pursue careers in many fields of science and engineering.

#### Learning Outcomes:

a. Students should be able to identify and describe physical systems with a rigorous representation using their professional knowledge.

(By means of coursework and tutorial classes in the curriculum)

b. Students should 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)

c. Students should be able to apply mathematical theory and techniques to analyze physical problems qualitatively and quantitatively.

(By means of coursework, tutorial classes and research-based projects in the curriculum)

d. Students should be able to communicate and collaborate with people effectively in scientific issues. (By means of group projects, tutorial sessions and presentation opportunities in the curriculum)

e. Students should be able to apply scientific and quantitative methods in tackling problems in research or realword setting.

(By means of projects, directed studies, local and foreign internships attached to universities, research centers, government bodies, NGOs and influential companies.)

## **Minimum Entry Requirement:**

(note 1)

1. AL / AS Physics or AL Engineering Science; and

2. HKCEE Additional Mathematics and AS Mathematics and Statistics, or AL Pure Mathematics; or

3. a pass in PHYS0114 Fundamental physics I and PHYS0115 Fundamental physics II or a pass in PHYS0625 Physics by inquiry or equivalent and pass in MATH0201 Basic calculus (for those with HKCEE only) or a pass in MATH1804 University mathematics A (for those with AS Math & Stat only)

## Minimum Credit Requirement:

78 credits (24 credits introductory level, 54 credits advanced level courses including experiential learning requirement)

## Impermissible Combination:

Major in Mathematics; Physics Minor in Mathematics; Physics

## Required courses (78 credits) (note 2)

## 1. Introductory level courses (24 credits) (note 3)

MATH1111 Linear algebra 6 MATH1211 Multivariable calculus 6 PHYS1414 General physics I 6 PHYS1415 General physics II 6

## 2. Advanced level courses (48 credits) (note 4)

MATH2201 Introduction to mathematical analysis 6 MATH2301 Algebra I 6 MATH2403 Functions of a complex variable 6 MATH2405 Differential equations 6 PHYS2321 Introductory electromagnetism 6 PHYS2322 Statistical mechanics and thermodynamics 6 PHYS2626 Introductory classical mechanics 6 PHYS2627 Introductory quantum physics (note 5) 6

## 3. Experiential learning requirement (6 credits) \*

Students must take at least one of the following forms of extra-ordinary learning experience to fulfill the experiential learning requirement:

- MATH2002 Mathematics seminar (note 6) 6

- MATH2999 Directed studies in mathematics 6
- MATH3988 Mathematics internship 6
- MATH3999 Mathematics project 12
- PHYS2533 Directed studies in physics 6
- PHYS3531 Physics project 12
- PHYS3987 Quantitative tools in physics (non-credit bearing)
- PHYS3988 Physics internship 6
- SCNC2005 Career development for science students (non-credit bearing)
- SCNC2988 Service learning internship (non-credit bearing)

- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)

- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (noncredit bearing)

\* If the extra-ordinary learning experience is fulfilled by non-credit bearing activities, students must take an additional 6-credit advanced level mathematics / physics course (MATH2XXX or MATH3XXX or MATH6XXX or PHYS2XXX or PHYS6XXX level).

Students are not required to take EL if this Science major is taken as a second major but a 6-credit advanced level course in the second major must be taken to fulfill the credit requirement.

#### Notes:

1 Students with different mathematics background must consult the Department of Mathematics for advice on the bridging courses.

2 Students would have already satisfied requirements from Blocks A and B with this curriculum.

3 Students are recommended to take also MATH1001.

4 Students who intend to pursue further studies in Mathematics/Physics are recommended to take also MATH2401, MATH3501, PHYS3331, and PHYS3332.

5 Students may consider taking PHYS2627 as early as possible to allow for maximum flexibility in course selection for advanced level courses.

6 MATH2002 is for first year BSc students only.

## Remarks:

Major Title	Major in Microbiology
Offered to students admitted to Year 1 in	2012-2013

#### Objectives:

The aim of this major is to provide students with a stimulating, valuable and enjoyable learning experience in microbiology, a key life science discipline for the 21st century. Microbiology lies at the heart of understanding human health and disease, environmental processes and protection and advances in biotechnology and industrial microbiology. The curriculum places a strong emphasis on modern molecular approaches and analytical techniques. Core courses provide training in fundamental scientific skills and students also have the flexibility to choose form a variety of elective courses so that they may pursue their own interests in microbiology. Specialization is currently possible in medical microbiology, food microbiology, environmental microbiology and microbial biotechnology. Students interact closely with professors in a variety of interactive learning opportunities including laboratory classes and fieldtrips, seminars, tutorials and group activities. The critical thinking and communication skills emphasized during learning in this major are highly sought-after by employers.

#### Learning Outcomes:

a. Students will acquire the ability to clearly describe the key concepts and advances in microbiology including: the evolution and diversity of microbial life, microbial physiology, the occurrence and role of microorganisms in natural environments, the role of microorganisms in disease and medicine, food production and spoilage, plus their applications in biotechnology.

(achieved through lectures and interactive learning experiences)

b. Students will develop an understanding of broader scientific concepts, and be able to relate these to scientific issues of significance in their daily lives and also of more global significance. (achieved through lectures and interactive learning experiences)

c. Students will develop their skills in critical thinking and the ability to recognize real-world situations where they may apply these skills.

(achieved through problem-based learning experiences)

d. Students will improve their oral and written communication skills, and gain confidence in interacting with their peers and professors individually and as part of a team. (achieved through interactive learning experiences)

e. Students will gain an insight into the professional work of scientists and have exposure to potential employers during project work or placement. (achieved through experiential learning)

#### **Minimum Entry Requirement:**

AL Biology or equivalent, or a pass in BIOL0126 Fundamentals of biology

#### **Minimum Credit Requirement:**

72 credits (18 credits introductory level, 54 credits advanced level courses including experiential learning requirement)

#### Impermissible Combination:

Minor in Microbiology

## **Required courses (72 credits)**

#### 1. Introductory level courses (18 credits)

BIOL0135 Introductory microbiology 6 BIOL1125 Introduction to biochemistry OR BIOC1001 Basic biochemistry 6 BIOL1133 Biological science laboratory course 6

#### 2. Advanced level courses (48 credits)

BIOL2111 Molecular microbiology 6 BIOL2205 Immunology 6 BIOL2303 Molecular biology 6 BIOL2324 Microbial physiology and biochemistry 6

Plus at least 24 credits of the following courses:

BIOL2302 Fermentation technology 6

BIOL2515 Food microbiology 6 BIOL2606 Environmental microbiology 6 BIOL3214 General virology 6 BIOL3219 Clinical microbiology and applied immunology 6 BIOL3317 Microbial biotechnology 6 BIOL3325 Molecular phylogenetics and evolution 6 ENVS2009 Remediation 6

## 3. Experiential learning requirement (6 credits) \*

Students must take at least one of the following forms of extra-ordinary learning experience to fulfill the experiential learning requirement:

- BIOL2318 Biological sciences field course 6

- BIOL2320 Directed studies in biological sciences 6
- BIOL3321 Biological sciences project 12
- BIOL3988 Biological science internship 6
- SCNC2005 Career development for science students (non-credit bearing)
- SCNC2988 Service learning internship (non-credit bearing)

- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)

- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (noncredit bearing)

\* If the extra-ordinary learning experience is fulfilled by non-credit bearing activities, students must take an additional 6-credit advanced level biological sciences course (BIOL2XXX or BIOL3XXX level). Students are not required to take EL if this Science major is taken as a second major but a 6-credit advanced level course in the second major must be taken to fulfill the credit requirement.

#### **Remarks:**

Major Title	Major in Microbiology
Offered to students admitted to Year 1 in	2011-2012

#### Objectives:

The aim of this major is to provide students with a stimulating, valuable and enjoyable learning experience in microbiology, a key life science discipline for the 21st century. Microbiology lies at the heart of understanding human health and disease, environmental processes and protection and advances in biotechnology and industrial microbiology. The curriculum places a strong emphasis on modern molecular approaches and analytical techniques. Core courses provide training in fundamental scientific skills and students also have the flexibility to choose form a variety of elective courses so that they may pursue their own interests in microbiology. Specialization is currently possible in medical microbiology, food microbiology, environmental microbiology and microbial biotechnology. Students interact closely with professors in a variety of interactive learning opportunities including laboratory classes and fieldtrips, seminars, tutorials and group activities. The critical thinking and communication skills emphasized during learning in this major are highly sought-after by employers.

#### Learning Outcomes:

a. Students will acquire the ability to clearly describe the key concepts and advances in microbiology including: the evolution and diversity of microbial life, microbial physiology, the occurrence and role of microorganisms in natural environments, the role of microorganisms in disease and medicine, food production and spoilage, plus their applications in biotechnology.

(achieved through lectures and interactive learning experiences)

b. Students will develop an understanding of broader scientific concepts, and be able to relate these to scientific issues of significance in their daily lives and also of more global significance. (achieved through lectures and interactive learning experiences)

c. Students will develop their skills in critical thinking and the ability to recognize real-world situations where they may apply these skills.

(achieved through problem-based learning experiences)

d. Students will improve their oral and written communication skills, and gain confidence in interacting with their peers and professors individually and as part of a team. (achieved through interactive learning experiences)

e. Students will gain an insight into the professional work of scientists and have exposure to potential employers during project work or placement. (achieved through experiential learning)

## Minimum Entry Requirement:

AL Biology or equivalent, or a pass in BIOL0126 Fundamentals of biology

#### **Minimum Credit Requirement:**

72 credits (18 credits introductory level, 54 credits advanced level courses including experiential learning requirement)

#### Impermissible Combination:

Minor in Microbiology

#### Required courses (72 credits)

#### 1. Introductory level courses (18 credits)

BIOL0135 Introductory microbiology 6 BIOL1125 Introduction to biochemistry OR BIOC1001 Basic biochemistry 6 BIOL1133 Biological science laboratory course 6

## 2. Advanced level courses (48 credits)

BIOL2111 Molecular microbiology 6 BIOL2205 Immunology 6 BIOL2303 Molecular biology 6 BIOL2324 Microbial physiology and biochemistry 6

Plus at least 24 credits of the following courses:

BIOL2302 Fermentation technology 6

BIOL2515 Food microbiology 6 BIOL2606 Environmental microbiology 6 BIOL3214 General virology 6

BIOL3219 Clinical microbiology and applied immunology 6

BIOL3317 Microbial biotechnology 6

BIOL3325 Molecular phylogenetics and evolution 6

BIOL3624 Environmental monitoring and remediation techniques 6

## 3. Experiential learning requirement (6 credits) \*

Students must take at least one of the following forms of extra-ordinary learning experience to fulfill the experiential learning requirement:

- BIOL2318 Biological sciences field course 6

- BIOL2320 Directed studies in biological sciences 6

- BIOL3321 Biological sciences project 12

- BIOL3988 Biological science internship 6

- SCNC2005 Career development for science students (non-credit bearing)

- SCNC2988 Service learning internship (non-credit bearing)

- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)

- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (noncredit bearing)

\* If the extra-ordinary learning experience is fulfilled by non-credit bearing activities, students must take an additional 6-credit advanced level biological sciences course (BIOL2XXX or BIOL3XXX level). Students are not required to take EL if this Science major is taken as a second major but a 6-credit advanced level course in the second major must be taken to fulfill the credit requirement.

#### **Remarks:**

Major Title	Major in Microbiology
Offered to students admitted to Year 1 in	2010-2011

#### Objectives:

The aim of this major is to provide students with a stimulating, valuable and enjoyable learning experience in microbiology, a key life science discipline for the 21st century. Microbiology lies at the heart of understanding human health and disease, environmental processes and protection and advances in biotechnology and industrial microbiology. The curriculum places a strong emphasis on modern molecular approaches and analytical techniques. Core courses provide training in fundamental scientific skills and students also have the flexibility to choose form a variety of elective courses so that they may pursue their own interests in microbiology. Specialization is currently possible in medical microbiology, food microbiology, environmental microbiology and microbial biotechnology. Students interact closely with professors in a variety of interactive learning opportunities including laboratory classes and fieldtrips, seminars, tutorials and group activities. The critical thinking and communication skills emphasized during learning in this major are highly sought-after by employers.

#### Learning Outcomes:

a. Students will acquire the ability to clearly describe the key concepts and advances in microbiology including: the evolution and diversity of microbial life, microbial physiology, the occurrence and role of microorganisms in natural environments, the role of microorganisms in disease and medicine, food production and spoilage, plus their applications in biotechnology.

(achieved through lectures and interactive learning experiences)

b. Students will develop an understanding of broader scientific concepts, and be able to relate these to scientific issues of significance in their daily lives and also of more global significance. (achieved through lectures and interactive learning experiences)

c. Students will develop their skills in critical thinking and the ability to recognize real-world situations where they may apply these skills.

(achieved through problem-based learning experiences)

d. Students will improve their oral and written communication skills, and gain confidence in interacting with their peers and professors individually and as part of a team. (achieved through interactive learning experiences)

e. Students will gain an insight into the professional work of scientists and have exposure to potential employers during project work or placement. (achieved through experiential learning)

#### **Minimum Entry Requirement:**

AL Biology or equivalent, or a pass in BIOL0126 Fundamentals of biology

#### **Minimum Credit Requirement:**

72 credits (18 credits introductory level, 54 credits advanced level courses including experiential learning requirement)

#### Impermissible Combination:

Minor in Microbiology

## **Required courses (72 credits)**

#### 1. Introductory level courses (18 credits)

BIOL0135 Introductory microbiology 6 BIOL1125 Introduction to biochemistry OR BIOC1001 Basic biochemistry 6 BIOL1133 Biological science laboratory course 6

#### 2. Advanced level courses (48 credits)

BIOL2111 Molecular microbiology 6 BIOL2205 Immunology 6 BIOL2303 Molecular biology 6 BIOL2324 Microbial physiology and biochemistry 6

Plus at least 24 credits of the following courses:

BIOL2302 Fermentation technology 6

BIOL2515 Food microbiology 6 BIOL2606 Environmental microbiology 6 BIOL3214 General virology 6

BIOL3219 Clinical microbiology and applied immunology 6

BIOL3317 Microbial biotechnology 6

BIOL3325 Molecular phylogenetics and evolution 6

BIOL3624 Environmental monitoring and remediation techniques 6

#### 3. Experiential learning requirement (6 credits) \*

Students must take at least one of the following forms of extra-ordinary learning experience to fulfill the experiential learning requirement:

- BIOL2318 Biological sciences field course 6

- BIOL2320 Directed studies in biological sciences 6

- BIOL3321 Biological sciences project 12

- BIOL3988 Biological science internship 6

- SCNC2005 Career development for science students (non-credit bearing)

- SCNC2988 Service learning internship (non-credit bearing)

- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)

- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (noncredit bearing)

\* If the extra-ordinary learning experience is fulfilled by non-credit bearing activities, students must take an additional 6-credit advanced level biological sciences course (BIOL2XXX or BIOL3XXX level). Students are not required to take EL if this Science major is taken as a second major but a 6-credit advanced level course in the second major must be taken to fulfill the credit requirement.

#### **Remarks:**

Major Title	Major in Microbiology
Offered to students admitted to Year 1 in	2009-2010

The aim of this major is to provide students with a stimulating, valuable and enjoyable learning experience in microbiology, a key life science discipline for the 21st century. Microbiology lies at the heart of understanding human health and disease, environmental processes and protection and advances in biotechnology and industrial microbiology. The curriculum places a strong emphasis on modern molecular approaches and analytical techniques. Core courses provide training in fundamental scientific skills and students also have the flexibility to choose form a variety of elective courses so that they may pursue their own interests in microbiology. Specialization is currently possible in medical microbiology, food microbiology, environmental microbiology and microbial biotechnology. Students interact closely with professors in a variety of interactive learning opportunities including laboratory classes and fieldtrips, seminars, tutorials and group activities. The critical thinking and communication skills emphasized during learning in this major are highly sought-after by employers.

#### Learning Outcomes:

a. Students will acquire the ability to clearly describe the key concepts and advances in microbiology including: the evolution and diversity of microbial life, microbial physiology, the occurrence and role of microorganisms in natural environments, the role of microorganisms in disease and medicine, food production and spoilage, plus their applications in biotechnology.

(achieved through lectures and interactive learning experiences)

b. Students will develop an understanding of broader scientific concepts, and be able to relate these to scientific issues of significance in their daily lives and also of more global significance. (achieved through lectures and interactive learning experiences)

c. Students will develop their skills in critical thinking and the ability to recognize real-world situations where they may apply these skills.

(achieved through problem-based learning experiences)

d. Students will improve their oral and written communication skills, and gain confidence in interacting with their peers and professors individually and as part of a team. (achieved through interactive learning experiences)

e. Students will gain an insight into the professional work of scientists and have exposure to potential employers during project work or placement. (achieved through experiential learning)

#### Minimum Entry Requirement:

AL Biology or equivalent, or a pass in BIOL0126 Fundamentals of biology

#### **Minimum Credit Requirement:**

72 credits (18 credits introductory level, 54 credits advanced level courses including experiential learning requirement)

#### Impermissible Combination:

Minor in Microbiology

#### Required courses (72 credits)

#### 1. Introductory level courses (18 credits)

BIOL0129 Introductory microbiology (note 1) (3) OR BIOL0135 Introductory microbiology 6 BIOL0131 Basic medical microbiology (note 1) 3 BIOL1125 Introduction to biochemistry OR BIOC1001 Basic biochemistry 6 BIOL1133 Biological science laboratory course 6

#### 2. Advanced level courses (48 credits)

BIOL2111 Molecular microbiology 6 BIOL2205 Immunology 6 BIOL2303 Molecular biology 6 BIOL2324 Microbial physiology and biochemistry 6

Plus at least 24 credits of the following courses:

BIOL2302 Fermentation technology 6 BIOL2515 Food microbiology 6 BIOL2606 Environmental microbiology 6 BIOL3214 General virology 6 BIOL3219 Clinical microbiology and applied immunology 6 BIOL3317 Microbial biotechnology 6 BIOL3325 Molecular phylogenetics and evolution 6 BIOL3624 Environmental monitoring and remediation techniques 6

#### 3. Experiential learning requirement (6 credits) \*

Students must take at least one of the following forms of extra-ordinary learning experience to fulfill the experiential learning requirement:

- BIOL2318 Biological sciences field course 6

- BIOL2320 Directed studies in biological sciences 6
- BIOL3321 Biological sciences project 12
- BIOL3988 Biological science internship 6
- SCNC2005 Career development for science students (non-credit bearing)
- SCNC2988 Service learning internship (non-credit bearing)

- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)

- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (noncredit bearing)

\* If the extra-ordinary learning experience is fulfilled by non-credit bearing activities, students must take an additional 6-credit advanced level biological sciences course (BIOL2XXX or BIOL3XXX level). Students are not required to take EL if this Science major is taken as a second major but a 6-credit advanced level course in the second major must be taken to fulfill the credit requirement.

#### Notes:

1 Not available in 2010-2011 or thereafter.

#### **Remarks:**

Major Title	Major in Physics
Offered to students admitted to Year 1 in	2012-2013

The Major in Physics is aimed to provide students a solid foundation on the subject. It covers a wide range of core courses which form the blocks of fundamental knowledge to learn specialization, 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 would 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 for work in their specialized area.

#### Learning Outcomes:

a. Students should be able to identify and describe physical systems with their professional knowledge. (By means of coursework and tutorial classes in the curriculum)

b. Students should 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)

c. Students should be able to analyze problems qualitatively and quantitatively. (By means of coursework, tutorial classes and research-based projects in the curriculum)

d. Students should be able to communicate and collaborate with people effectively in scientific issues. (By means of group projects, tutorial sessions and presentation opportunities in the curriculum)

e. Students should be able to apply scientific and quantitative methods in tackling problems in research or realword setting.

(By means of projects, directed studies, local and foreign internships attached to universities, research centers, government bodies, NGOs and influential companies.)

#### **Minimum Entry Requirement:**

1. AL / AS Physics or AL Engineering Science; and HKCEE Additional Mathematics or AS Mathematics and Statistics or AL Pure Mathematics; or

2. a pass in PHYS0625 Physics by inquiry; or equivalent

#### **Minimum Credit Requirement:**

72 credits (18 credits introductory level, 54 credits advanced level courses including experiential learning requirement)

#### Impermissible Combination:

Major in Mathematics/Physics Minor in Physics

#### Required courses (72 credits)

#### 1. Introductory level courses (18 credits)

PHYS1414 General physics I 6 PHYS1415 General physics II 6

Plus at least 6 credits of introductory level Physics courses (PHYS0XXX or PHYS1XXX level), subject to prerequisite requirements.

#### 2. Advanced level courses (48 credits) (note 1)

PHYS2627 Introductory quantum physics (note 2) 6

Plus at least 12 credits of the following courses:

PHYS2321 Introductory electromagnetism 6 PHYS2322 Statistical mechanics and thermodynamics 6 PHYS2323 Introductory quantum mechanics 6 PHYS2626 Introductory classical mechanics 6 Plus at least 30 credits of advanced level Physics courses (PHYS2XXX or PHYS3XXX or PHYS6XXX level), subject to prerequisite requirements.

#### 3. Experiential learning requirement (6 credits) \*

Students must take at least one of the following forms of extra-ordinary learning experience to fulfill the experiential learning requirement:

- PHYS2533 Directed studies in physics 6
- PHYS3531 Physics project 12
- PHYS3987 Quantitative tools in physics (non-credit bearing)
- PHYS3988 Physics internship 6
- SCNC2005 Career development for science students (non-credit bearing)
- SCNC2988 Service learning internship (non-credit bearing)
- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)

- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (noncredit bearing)

\* If the extra-ordinary learning experience is fulfilled by non-credit bearing activities, students must take an additional 6-credit advanced level physics course (PHYS2XXX or PHYS3XXX or PHYS6XXX level). Students are not required to take EL if this Science major is taken as a second major but a 6-credit advanced level course in the second major must be taken to fulfill the credit requirement.

#### Notes:

1 Students who intend to pursue further studies in Physics are recommended to take also PHYS3331 and PHYS3332

2 Students may consider taking PHYS2627 as early as possible to allow for maximum flexibility in course selection for advanced level courses.

#### **Remarks:**

Major Title	Major in Physics
Offered to students admitted to Year 1 in	2011-2012

The Major in Physics is aimed to provide students a solid foundation on the subject. It covers a wide range of core courses which form the blocks of fundamental knowledge to learn specialization, 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 would 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 for work in their specialized area.

#### Learning Outcomes:

a. Students should be able to identify and describe physical systems with their professional knowledge. (By means of coursework and tutorial classes in the curriculum)

b. Students should 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)

c. Students should be able to analyze problems qualitatively and quantitatively. (By means of coursework, tutorial classes and research-based projects in the curriculum)

d. Students should be able to communicate and collaborate with people effectively in scientific issues. (By means of group projects, tutorial sessions and presentation opportunities in the curriculum)

e. Students should be able to apply scientific and quantitative methods in tackling problems in research or realword setting.

(By means of projects, directed studies, local and foreign internships attached to universities, research centers, government bodies, NGOs and influential companies.)

#### **Minimum Entry Requirement:**

1. AL / AS Physics or AL Engineering Science; and HKCEE Additional Mathematics or AS Mathematics and Statistics or AL Pure Mathematics; or

2. a pass in PHYS0625 Physics by inquiry; or equivalent

#### **Minimum Credit Requirement:**

72 credits (18 credits introductory level, 54 credits advanced level courses including experiential learning requirement)

#### Impermissible Combination:

Major in Mathematics/Physics Minor in Physics

#### Required courses (72 credits)

#### 1. Introductory level courses (18 credits)

PHYS1414 General physics I 6 PHYS1415 General physics II 6

Plus at least 6 credits of introductory level Physics courses (PHYS0XXX or PHYS1XXX level), subject to prerequisite requirements.

#### 2. Advanced level courses (48 credits) (note 1)

PHYS2627 Introductory quantum physics (note 2) 6

Plus at least 12 credits of the following courses:

PHYS2321 Introductory electromagnetism 6 PHYS2322 Statistical mechanics and thermodynamics 6 PHYS2323 Introductory quantum mechanics 6 PHYS2626 Introductory classical mechanics 6 Plus at least 30 credits of advanced level Physics courses (PHYS2XXX or PHYS3XXX or PHYS6XXX level), subject to prerequisite requirements.

#### 3. Experiential learning requirement (6 credits) \*

Students must take at least one of the following forms of extra-ordinary learning experience to fulfill the experiential learning requirement:

- PHYS2533 Directed studies in physics 6
- PHYS3531 Physics project 12
- PHYS3987 Quantitative tools in physics (non-credit bearing)
- PHYS3988 Physics internship 6
- SCNC2005 Career development for science students (non-credit bearing)
- SCNC2988 Service learning internship (non-credit bearing)
- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)

- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (noncredit bearing)

\* If the extra-ordinary learning experience is fulfilled by non-credit bearing activities, students must take an additional 6-credit advanced level physics course (PHYS2XXX or PHYS3XXX or PHYS6XXX level). Students are not required to take EL if this Science major is taken as a second major but a 6-credit advanced level course in the second major must be taken to fulfill the credit requirement.

#### Notes:

1 Students who intend to pursue further studies in Physics are recommended to take also PHYS3331 and PHYS3332

2 Students may consider taking PHYS2627 as early as possible to allow for maximum flexibility in course selection for advanced level courses.

#### **Remarks:**

Major Title	Major in Physics
Offered to students admitted to Year 1 in	2010-2011

The Major in Physics is aimed to provide students a solid foundation on the subject. It covers a wide range of core courses which form the blocks of fundamental knowledge to learn specialization, 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 would 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 for work in their specialized area.

#### Learning Outcomes:

a. Students should be able to identify and describe physical systems with their professional knowledge. (By means of coursework and tutorial classes in the curriculum)

b. Students should 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)

c. Students should be able to analyze problems qualitatively and quantitatively. (By means of coursework, tutorial classes and research-based projects in the curriculum)

d. Students should be able to communicate and collaborate with people effectively in scientific issues. (By means of group projects, tutorial sessions and presentation opportunities in the curriculum)

e. Students should be able to apply scientific and quantitative methods in tackling problems in research or realword setting.

(By means of projects, directed studies, local and foreign internships attached to universities, research centers, government bodies, NGOs and influential companies.)

#### **Minimum Entry Requirement:**

1. AL / AS Physics or AL Engineering Science; and HKCEE Additional Mathematics or AS Mathematics and Statistics or AL Pure Mathematics; or

2. a pass in PHYS0625 Physics by inquiry; or equivalent

#### **Minimum Credit Requirement:**

72 credits (18 credits introductory level, 54 credits advanced level courses including experiential learning requirement)

#### Impermissible Combination:

Major in Mathematics/Physics Minor in Physics

#### Required courses (72 credits)

#### 1. Introductory level courses (18 credits)

PHYS1414 General physics I 6 PHYS1415 General physics II 6

Plus at least 6 credits of introductory level Physics courses (PHYS0XXX or PHYS1XXX level), subject to prerequisite requirements.

#### 2. Advanced level courses (48 credits) (note 1)

PHYS2627 Introductory quantum physics (note 2) 6

Plus at least 12 credits of the following courses:

PHYS2321 Introductory electromagnetism 6 PHYS2322 Statistical mechanics and thermodynamics 6 PHYS2323 Introductory quantum mechanics 6 PHYS2626 Introductory classical mechanics 6 Plus at least 30 credits of advanced level Physics courses (PHYS2XXX or PHYS3XXX or PHYS6XXX level), subject to prerequisite requirements.

#### 3. Experiential learning requirement (6 credits) \*

Students must take at least one of the following forms of extra-ordinary learning experience to fulfill the experiential learning requirement:

- PHYS2533 Directed studies in physics 6
- PHYS3531 Physics project 12
- PHYS3987 Quantitative tools in physics (non-credit bearing)
- PHYS3988 Physics internship 6
- SCNC2005 Career development for science students (non-credit bearing)
- SCNC2988 Service learning internship (non-credit bearing)
- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)

- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (noncredit bearing)

\* If the extra-ordinary learning experience is fulfilled by non-credit bearing activities, students must take an additional 6-credit advanced level physics course (PHYS2XXX or PHYS3XXX or PHYS6XXX level). Students are not required to take EL if this Science major is taken as a second major but a 6-credit advanced level course in the second major must be taken to fulfill the credit requirement.

#### Notes:

1 Students who intend to pursue further studies in Physics are recommended to take also PHYS3331 and PHYS3332

2 Students may consider taking PHYS2627 as early as possible to allow for maximum flexibility in course selection for advanced level courses.

#### **Remarks:**

Major Title	Major in Physics
Offered to students admitted to Year 1 in	2009-2010

The Major in Physics is aimed to provide students a solid foundation on the subject. It covers a wide range of core courses which form the blocks of fundamental knowledge to learn specialization, 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 would 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 for work in their specialized area.

#### Learning Outcomes:

a. Students should be able to identify and describe physical systems with their professional knowledge. (By means of coursework and tutorial classes in the curriculum)

b. Students should 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)

c. Students should be able to analyze problems qualitatively and quantitatively. (By means of coursework, tutorial classes and research-based projects in the curriculum)

d. Students should be able to communicate and collaborate with people effectively in scientific issues. (By means of group projects, tutorial sessions and presentation opportunities in the curriculum)

e. Students should be able to apply scientific and quantitative methods in tackling problems in research or realword setting.

(By means of projects, directed studies, local and foreign internships attached to universities, research centers, government bodies, NGOs and influential companies.)

#### **Minimum Entry Requirement:**

1. AL / AS Physics or AL Engineering Science; and HKCEE Additional Mathematics or AS Mathematics and Statistics or AL Pure Mathematics; or

2. A pass in PHYS0114 Fundamental physics I and PHYS0115 Fundamental physics II or a pass in PHYS0625 Physics by inquiry;

or equivalent

#### Minimum Credit Requirement:

72 credits (18 credits introductory level, 54 credits advanced level courses including experiential learning requirement)

#### Impermissible Combination:

Major in Mathematics/Physics Minor in Physics

#### Required courses (72 credits)

#### 1. Introductory level courses (18 credits)

PHYS1414 General physics I 6 PHYS1415 General physics II 6

Plus at least 6 credits of introductory level Physics courses (PHYS0XXX or PHYS1XXX level), subject to prerequisite requirements.

#### 2. Advanced level courses (48 credits) (note 1)

PHYS2627 Introductory quantum physics (note 2) 6

Plus at least 12 credits of the following courses:

PHYS2321 Introductory electromagnetism 6 PHYS2322 Statistical mechanics and thermodynamics 6 PHYS2323 Introductory quantum mechanics 6 PHYS2626 Introductory classical mechanics 6 Plus at least 30 credits of advanced level Physics courses (PHYS2XXX or PHYS3XXX or PHYS6XXX level), subject to prerequisite requirements.

#### 3. Experiential learning requirement (6 credits) \*

Students must take at least one of the following forms of extra-ordinary learning experience to fulfill the experiential learning requirement:

- PHYS2533 Directed studies in physics 6

- PHYS3531 Physics project 12
- PHYS3987 Quantitative tools in physics (non-credit bearing)
- PHYS3988 Physics internship 6
- SCNC2005 Career development for science students (non-credit bearing)
- SCNC2988 Service learning internship (non-credit bearing)

- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)

- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (noncredit bearing)

\* If the extra-ordinary learning experience is fulfilled by non-credit bearing activities, students must take an additional 6-credit advanced level physics course (PHYS2XXX or PHYS3XXX or PHYS6XXX level). Students are not required to take EL if this Science major is taken as a second major but a 6-credit advanced level course in the second major must be taken to fulfill the credit requirement.

#### Notes:

1 Students who intend to pursue further studies in Physics are recommended to take also PHYS3331 and PHYS3332

2 Students may consider taking PHYS2627 as early as possible to allow for maximum flexibility in course selection for advanced level courses.

#### **Remarks:**

Major Title	Major in Risk Management
Offered to students admitted to Year 1 in	2012-2013

The Risk Management curriculum at the University of Hong Kong aims to provide students with the skills and expertise to enable them to acquire the theory and methodology behind the scientific process of risk management, with application to actuarial science, finance and other 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:

a. Students would be able to identify and categorize the various risks faced by an organization and be able to demonstrate a critical understanding of generic risk management issues and techniques. (by means of coursework, tutorial classes and/or project-based learning in the curriculum)

b. Students would be able to 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)

c. Students would be able to critically evaluate and make effective use of models and techniques for risk assessment and management.

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

d. Students would be able to 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)

e. Students would gain insights into current advances in risk management through either project or industrial training.

(by means of coursework, tutorial classes, project-based and/or experiential learning in the curriculum)

#### Minimum Entry Requirement:

A pass in AL Pure Mathematics or equivalent, or MATH1804 University mathematics A, or MATH0211 Basic applicable mathematics with grade B- or above

#### Minimum Credit Requirement:

72 credits (18 credits introductory level, 54 credits advanced level courses including experiential learning requirement)

#### Impermissible Combination:

Minor in Risk Management

#### Required courses (72 credits)

#### 1. Introductory level courses (18 credits)

STAT1301 Probability and statistics I 6 STAT1302 Probability and statistics II 6 STAT1303 Data management 6

Alternative courses possible in the case of students taking Major/Minor in Statistics with an overlap of core courses:

Any 6-credit advanced level statistics course (STAT2XXX or STAT3XXX or STAT6XXX level), subject to the Department's approval.

#### 2. Advanced level courses (48 credits)

STAT2301 Linear statistical analysis 6 STAT2309 The statistics of investment risk 6 STAT2315 Practical mathematics for investment 6 STAT3301 Time-series analysis 6 Alternative courses possible in the case of students taking Major/Minor in Statistics with an overlap of core courses:

Any from the list below

Plus at least 24 credits of the following courses:

STAT2303 Probability modelling 6 STAT2310 Risk management and insurance 6 STAT2312 Data mining 6 STAT3303 Derivatives and risk management 6 STAT3320 Risk management and Basel Accords in banking and finance 6 STAT3321 Credit risk analysis 6 STAT3322 Market risk analysis 6 STAT3323 Current topics in risk management 6 STAT3821 Financial economics II 6

#### 3. Experiential learning requirement (6 credits) \*

Students must take at least one of the following forms of extra-ordinary learning experience to fulfill the experiential learning requirement:

- STAT2318 Directed studies in statistics 6

- STAT3319 Statistics project 12
- STAT3988 Statistics internship 6
- STAT3989 Essential IT skills for statistical and risk analysts (non-credit bearing)
- SCNC2005 Career development for science students (non-credit bearing)
- SCNC2988 Service learning internship (non-credit bearing)

- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)

- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (noncredit bearing)

\* If the extra-ordinary learning experience is fulfilled by non-credit bearing activities, students must take an additional 6-credit advanced level statistics course (STAT2XXX or STAT3XXX or STAT6XXX level). Students are not required to take EL if this Science major is taken as a second major but a 6-credit advanced level course in the second major must be taken to fulfill the credit requirement.

#### Remarks:

Major Title	Major in Risk Management
Offered to students admitted to Year 1 in	2011-2012

The Risk Management curriculum at the University of Hong Kong aims to provide students with the skills and expertise to enable them to acquire the theory and methodology behind the scientific process of risk management, with application to actuarial science, finance and other 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 discrete-time models in finance, stochastic calculus with financial applications, and financial time series modeling. Through participating in experiential learning activities including research-based projects, industrial internships and overseas exchanges, students could enhance their knowledge in risk management and exposure in managing risk in practice, and improve their thinking and communication skills.

#### Learning Outcomes:

a. Students would be able to identify and categorize the various risks faced by an organization and be able to demonstrate a critical understanding of generic risk management issues and techniques. (by means of coursework, tutorial classes and/or project-based learning in the curriculum)

b. Students would be able to 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)

c. Students would be able to critically evaluate and make effective use of models and techniques for risk assessment and management.

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

d. Students would be able to 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)

e. Students would gain insights into current advances in risk management through either project or industrial training.

(by means of coursework, tutorial classes, project-based and/or experiential learning in the curriculum)

#### Minimum Entry Requirement:

A pass in AL Pure Mathematics or equivalent, or MATH1804 University mathematics A, or MATH0211 Basic applicable mathematics with grade B- or above

#### **Minimum Credit Requirement:**

72 credits (18 credits introductory level, 54 credits advanced level courses including experiential learning requirement)

#### Impermissible Combination:

Minor in Risk Management

#### Required courses (72 credits)

#### 1. Introductory level courses (18 credits)

STAT1301 Probability and statistics I 6 STAT1302 Probability and statistics II 6

Plus at least 6 credits of the following courses:

STAT1303 Data management 6 STAT1304 Design and analysis of sample surveys 6 STAT1323 Introduction to demographic and socio-economic statistics 6

Alternative courses possible in the case of students taking Major/Minor in Statistics with an overlap of core courses:

Any 6-credit advanced level statistics course (STAT2XXX, STAT3XXX or STAT6XXX level), subject to the

Department's approval.

#### 2. Advanced level courses (48 credits)

STAT2301 Linear statistical analysis 6 STAT2309 The statistics of investment risk 6 STAT2315 Practical mathematics for investment 6 STAT3301 Time-series analysis 6

Alternative courses possible in the case of students taking Major/Minor in Statistics with an overlap of core courses:

Any from the list below

Plus at least 24 credits of the following courses:

STAT2303 Probability modelling 6

STAT2310 Risk management and insurance 6

STAT2312 Data mining 6

STAT3303 Derivatives and risk management 6

STAT3320 Risk management and Basel Accords in banking and finance 6

STAT3321 Credit risk analysis 6

STAT3322 Market risk analysis 6

STAT3323 Current topics in risk management 6

STAT3821 Financial economics II 6

#### 3. Experiential learning requirement (6 credits) \*

Students must take at least one of the following forms of extra-ordinary learning experience to fulfill the experiential learning requirement:

- STAT2318 Directed studies in statistics 6

- STAT3319 Statistics project 12

- STAT3988 Statistics internship 6
- STAT3989 Essential IT skills for statistical and risk analysts (non-credit bearing)
- SCNC2005 Career development for science students (non-credit bearing)
- SCNC2988 Service learning internship (non-credit bearing)

- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)

- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (noncredit bearing)

\* If the extra-ordinary learning experience is fulfilled by non-credit bearing activities, students must take an additional 6-credit advanced level statistics course (STAT2XXX or STAT3XXX or STAT6XXX level). Students are not required to take EL if this Science major is taken as a second major but a 6-credit advanced level course in the second major must be taken to fulfill the credit requirement.

#### **Remarks:**

Major Title	Major in Risk Management
Offered to students admitted to Year 1 in	2010-2011

The Risk Management curriculum at the University of Hong Kong aims to provide students with the skills and expertise to enable them to acquire the theory and methodology behind the scientific process of risk management, with application to actuarial science, finance and other 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 discrete-time models in finance, stochastic calculus with financial applications, and financial time series modeling. Through participating in experiential learning activities including research-based projects, industrial internships and overseas exchanges, students could enhance their knowledge in risk management and exposure in managing risk in practice, and improve their thinking and communication skills.

#### Learning Outcomes:

a. Students would be able to identify and categorize the various risks faced by an organization and be able to demonstrate a critical understanding of generic risk management issues and techniques. (by means of coursework, tutorial classes and/or project-based learning in the curriculum)

b. Students would be able to 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)

c. Students would be able to critically evaluate and make effective use of models and techniques for risk assessment and management.

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

d. Students would be able to 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)

e. Students would gain insights into current advances in risk management through either project or industrial training.

(by means of coursework, tutorial classes, project-based and/or experiential learning in the curriculum)

#### Minimum Entry Requirement:

A pass in AL Pure Mathematics or equivalent, or MATH1804 University mathematics A, or MATH0211 Basic applicable mathematics with grade B- or above

#### **Minimum Credit Requirement:**

72 credits (18 credits introductory level, 54 credits advanced level courses including experiential learning requirement)

#### Impermissible Combination:

Minor in Risk Management

#### Required courses (72 credits)

#### 1. Introductory level courses (18 credits)

STAT1301 Probability and statistics I 6 STAT1302 Probability and statistics II 6

Plus at least 6 credits of the following courses:

STAT1303 Data management 6 STAT1304 Design and analysis of sample surveys 6 STAT1323 Introduction to demographic and socio-economic statistics 6

Alternative courses possible in the case of students taking Major/Minor in Statistics with an overlap of core courses:

Any 6-credit advanced level statistics course (STAT2XXX, STAT3XXX or STAT6XXX level), subject to the

Department's approval.

#### 2. Advanced level courses (48 credits)

STAT2301 Linear statistical analysis 6 STAT2309 The statistics of investment risk 6 STAT2315 Practical mathematics for investment 6 STAT3301 Time-series analysis 6

Alternative courses possible in the case of students taking Major/Minor in Statistics with an overlap of core courses:

Any from the list below

Plus at least 24 credits of the following courses:

STAT2303 Probability modelling 6

STAT2310 Risk management and insurance 6

STAT2312 Data mining 6

STAT3303 Derivatives and risk management 6

STAT3320 Risk management and Basel Accords in banking and finance/Risk management and Basel II in banking and finance 6

STAT3321 Credit risk analysis 6

STAT3322 Market risk analysis 6 STAT3821 Financial economics II 6

#### 3. Experiential learning requirement (6 credits) \*

Students must take at least one of the following forms of extra-ordinary learning experience to fulfill the experiential learning requirement:

- STAT2318 Directed studies in statistics 6

- STAT3319 Statistics project 12
- STAT3988 Statistics internship 6
- STAT3989 Essential IT skills for statistical and risk analysts (non-credit bearing)
- SCNC2005 Career development for science students (non-credit bearing)
- SCNC2988 Service learning internship (non-credit bearing)

- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)

- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (noncredit bearing)

\* If the extra-ordinary learning experience is fulfilled by non-credit bearing activities, students must take an additional 6-credit advanced level statistics course (STAT2XXX or STAT3XXX or STAT6XXX level). Students are not required to take EL if this Science major is taken as a second major but a 6-credit advanced level course in the second major must be taken to fulfill the credit requirement.

#### Remarks:

Major Title	Major in Risk Management
Offered to students admitted to Year 1 in	2009-2010

The Risk Management curriculum at the University of Hong Kong aims to provide students with the skills and expertise to enable them to acquire the theory and methodology behind the scientific process of risk management, with application to actuarial science, finance and other 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 discrete-time models in finance, stochastic calculus with financial applications, and financial time series modeling. Through participating in experiential learning activities including research-based projects, industrial internships and overseas exchanges, students could enhance their knowledge in risk management and exposure in managing risk in practice, and improve their thinking and communication skills.

#### Learning Outcomes:

a. Students would be able to identify and categorize the various risks faced by an organization and be able to demonstrate a critical understanding of generic risk management issues and techniques. (by means of coursework, tutorial classes and/or project-based learning in the curriculum)

b. Students would be able to 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)

c. Students would be able to critically evaluate and make effective use of models and techniques for risk assessment and management.

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

d. Students would be able to 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)

e. Students would gain insights into current advances in risk management through either project or industrial training.

(by means of coursework, tutorial classes, project-based and/or experiential learning in the curriculum)

#### Minimum Entry Requirement:

A pass in AL Pure Mathematics or equivalent, or MATH0211 Basic applicable mathematics

#### Minimum Credit Requirement:

72 credits (18 credits introductory level, 54 credits advanced level courses including experiential learning requirement)

#### Impermissible Combination:

Major in Statistics Minor in Risk Management; Statistics

#### Required courses (72 credits)

#### 1. Introductory level courses (18 credits)

STAT1301 Probability and statistics I 6 STAT1302 Probability and statistics II 6

Plus at least 6 credits of the following courses:

STAT1303 Data management 6 STAT1304 Design and analysis of sample surveys 6 STAT1323 Introduction to demographic and socio-economic statistics 6

#### 2. Advanced level courses (48 credits)

STAT2301 Linear statistical analysis 6 STAT2309 The statistics of investment risk 6 STAT3301 Time-series analysis 6 STAT2320 (note 1) / STAT3320 Risk management and Basel Accords in banking and finance/Risk management and Basel II in banking and finance 6

Plus at least 24 credits of the following courses:

STAT2303 Probability modelling 6 STAT2310 Risk management and insurance 6 STAT2312 Data mining 6 STAT2315 Practical mathematics for investment 6 STAT2812 Financial economics I 6 STAT3308 Financial engineering (note 1) OR STAT3303 Derivatives and risk management 6 STAT3321 Credit risk analysis 6 STAT3322 Market risk analysis 6 STAT3821 Financial economics II 6

#### 3. Experiential learning requirement (6 credits) \*

Students must take at least one of the following forms of extra-ordinary learning experience to fulfill the experiential learning requirement:

- STAT2318 Directed studies in statistics 6
- STAT3319 Statistics project 12
- STAT3988 Statistics internship 6
- STAT3989 Essential IT skills for statistical and risk analysts (non-credit bearing)
- SCNC2005 Career development for science students (non-credit bearing)
- SCNC2988 Service learning internship (non-credit bearing)

- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)

- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (noncredit bearing)

\* If the extra-ordinary learning experience is fulfilled by non-credit bearing activities, students must take an additional 6-credit advanced level statistics course (STAT2XXX or STAT3XXX or STAT6XXX level). Students are not required to take EL if this Science major is taken as a second major but a 6-credit advanced level course in the second major must be taken to fulfill the credit requirement.

#### Notes:

1 Not available in 2010-2011 or thereafter.

#### Remarks:

Major Title	Major in Statistics
Offered to students admitted to Year 1 in	2012-2013

The Major in Statistics curriculum centres on the study of statistics, a scientific discipline characterized by the development and applications of analytic and quantitative tools which involve logical thinking, problem formulation, probability reasoning and intensive data analyses. The programme aims to equip students with powerful mathematical, analytic and computational skills, which are in great demand in practical areas where data are obtained for the purpose of finding information in support of decision making. It establishes for 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:

a. Students would 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)

b. Students would be able to 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. (by means of coursework, tutorial classes and/or project-based learning in the curriculum)

c. Equipped with hands-on experience in data analysis using commercial statistical software, students would 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)

d. Students would 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)

e. Through the understanding and application of statistical concepts and techniques, students would 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 experiential learning in the curriculum)

#### Minimum Entry Requirement:

A pass in AL Pure Mathematics or equivalent, or MATH1804 University mathematics A, or MATH0211 Basic applicable mathematics with grade B- or above

#### Minimum Credit Requirement:

72 credits (18 credits introductory level, 54 credits advanced level courses including experiential learning requirement)

#### Impermissible Combination:

Minor in Statistics

#### Required courses (72 credits)

#### 1. Introductory level courses (18 credits)

STAT1301 Probability and statistics I 6 STAT1302 Probability and statistics II 6 STAT1303 Data management 6

Alternative courses possible in the case of students taking Major/Minor in Risk Management with an overlap of core courses:

Any 6-credit advanced level statistics course (STAT2XXX or STAT3XXX or STAT6XXX level), subject to the Department's approval.

#### 2. Advanced level courses (48 credits)

STAT2301 Linear statistical analysis 6 STAT2316 Advanced SAS programming 6 STAT3301 Time-series analysis 6 STAT3302 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:

STAT2302 Statistical inference 6 STAT2303 Probability modelling 6 STAT2304 Design and analysis of experiments 6

List B:

STAT2305 Quality control and Management 6 STAT2306 Business logistics 6 STAT2307 Statistics in clinical medicine & bio-medical research 6 STAT2308 Statistical genetics 6 STAT2312 Data mining 6 STAT2313 Marketing engineering 6 STAT2317 Sample survey methods 6 STAT3306 Selected topics in statistics 6 STAT3306 Selected topics in statistics 6 STAT3811 Survival analysis 6 Any 6-credit advanced level statistics course (STAT2XXX or STAT3XXX or STAT6XXX level), subject to the Department's approval 6

#### 3. Experiential learning requirement (6 credits) \*

Students must take at least one of the following forms of extra-ordinary learning experience to fulfill the experiential learning requirement:

- STAT2318 Directed studies in statistics 6

- STAT3319 Statistics project 12
- STAT3988 Statistics internship 6
- STAT3989 Essential IT skills for statistical and risk analysts (non-credit bearing)
- SCNC2005 Career development for science students (non-credit bearing)
- SCNC2988 Service learning internship (non-credit bearing)

- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)

- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (noncredit bearing)

\* If the extra-ordinary learning experience is fulfilled by non-credit bearing activities, students must take an additional 6-credit advanced level statistics course (STAT2XXX or STAT3XXX or STAT6XXX level). Students are not required to take EL if this Science major is taken as a second major but a 6-credit advanced level course in the second major must be taken to fulfill the credit requirement.

#### **Remarks:**

Major Title	Major in Statistics
Offered to students admitted to Year 1 in	2011-2012

The Major in Statistics curriculum centres on the study of statistics, a scientific discipline characterized by the development and applications of analytic and quantitative tools which involve logical thinking, problem formulation, probability reasoning and intensive data analyses. The programme aims to equip students with powerful mathematical, analytic and computational skills, which are in great demand in practical areas where data are obtained for the purpose of finding information in support of decision making. It establishes for 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:

a. Students would 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)

b. Students would be able to 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. (by means of coursework, tutorial classes and/or project-based learning in the curriculum)

c. Equipped with hands-on experience in data analysis using commercial statistical software, students would 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)

d. Students would 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)

e. Through the understanding and application of statistical concepts and techniques, students would 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 experiential learning in the curriculum)

#### Minimum Entry Requirement:

A pass in AL Pure Mathematics or equivalent, or MATH1804 University mathematics A, or MATH0211 Basic applicable mathematics with grade B- or above

#### Minimum Credit Requirement:

72 credits (18 credits introductory level, 54 credits advanced level courses including experiential learning requirement)

#### Impermissible Combination:

Minor in Statistics

#### Required courses (72 credits)

#### 1. Introductory level courses (18 credits)

STAT1301 Probability and statistics I 6 STAT1302 Probability and statistics II 6

Plus at least 6 credits of the following courses:

STAT1303 Data management 6 STAT1304 Design and analysis of sample surveys 6 STAT1323 Introduction to demographic and socio-economic statistics 6

Alternative courses possible in the case of students taking Major/Minor in Risk Management with an overlap of core courses:

Any 6-credit advanced level statistics course (STAT2XXX, STAT3XXX or STAT6XXX level), subject to the Department's approval.

2. Advanced level courses (48 credits)

STAT2301 Linear statistical analysis 6 STAT3301 Time-series analysis 6 STAT3302 Multivariate data analysis 6 STAT3304 Computer-aided statistical modelling 6

Plus at least 24 credits from Lists A and B, among which at least 6 credits from List A:

List A:

STAT2302 Statistical inference 6 STAT2303 Probability modelling 6 STAT2304 Design and analysis of experiments 6 STAT3316 Advanced probability 6 STAT3317 Computational statistics 6

List B:

STAT2305 Quality control and Management 6 STAT2306 Business logistics 6 STAT2307 Statistics in clinical medicine & bio-medical research 6 STAT2308 Statistical genetics 6 STAT2312 Data mining 6 STAT2313 Marketing engineering 6 STAT3306 Selected topics in statistics 6 STAT3811 Survival analysis 6

#### 3. Experiential learning requirement (6 credits) \*

Students must take at least one of the following forms of extra-ordinary learning experience to fulfill the experiential learning requirement:

- STAT2318 Directed studies in statistics 6

- STAT3319 Statistics project 12

- STAT3988 Statistics internship 6

- STAT3989 Essential IT skills for statistical and risk analysts (non-credit bearing)

- SCNC2005 Career development for science students (non-credit bearing)

- SCNC2988 Service learning internship (non-credit bearing)

- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)

- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (noncredit bearing)

\* If the extra-ordinary learning experience is fulfilled by non-credit bearing activities, students must take an additional 6-credit advanced level statistics course (STAT2XXX or STAT3XXX or STAT6XXX level). Students are not required to take EL if this Science major is taken as a second major but a 6-credit advanced level course in the second major must be taken to fulfill the credit requirement.

#### Remarks:

Major Title	Major in Statistics
Offered to students admitted to Year 1 in	2010-2011

The Major in Statistics curriculum centres on the study of statistics, a scientific discipline characterized by the development and applications of analytic and quantitative tools which involve logical thinking, problem formulation, probability reasoning and intensive data analyses. The programme aims to equip students with powerful mathematical, analytic and computational skills, which are in great demand in practical areas where data are obtained for the purpose of finding information in support of decision making. It establishes for 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:

a. Students would 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)

b. Students would be able to 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. (by means of coursework, tutorial classes and/or project-based learning in the curriculum)

c. Equipped with hands-on experience in data analysis using commercial statistical software, students would 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)

d. Students would 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)

e. Through the understanding and application of statistical concepts and techniques, students would 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 experiential learning in the curriculum)

#### Minimum Entry Requirement:

A pass in AL Pure Mathematics or equivalent, or MATH1804 University mathematics A, or MATH0211 Basic applicable mathematics with grade B- or above

#### Minimum Credit Requirement:

72 credits (18 credits introductory level, 54 credits advanced level courses including experiential learning requirement)

#### Impermissible Combination:

Minor in Statistics

#### Required courses (72 credits)

#### 1. Introductory level courses (18 credits)

STAT1301 Probability and statistics I 6 STAT1302 Probability and statistics II 6

Plus at least 6 credits of the following courses:

STAT1303 Data management 6 STAT1304 Design and analysis of sample surveys 6 STAT1323 Introduction to demographic and socio-economic statistics 6

Alternative courses possible in the case of students taking Major/Minor in Risk Management with an overlap of core courses:

Any 6-credit advanced level statistics course (STAT2XXX, STAT3XXX or STAT6XXX level), subject to the Department's approval.

2. Advanced level courses (48 credits)

STAT2301 Linear statistical analysis 6 STAT3301 Time-series analysis 6 STAT3302 Multivariate data analysis 6 STAT3304 Computer-aided statistical modelling 6

Plus at least 24 credits from Lists A and B, among which at least 6 credits from List A:

List A:

STAT2302 Statistical inference 6 STAT2303 Probability modelling 6 STAT2304 Design and analysis of experiments 6 STAT3316 Advanced probability 6 STAT3317 Computational statistics 6

List B:

STAT2305 Quality control and Management 6 STAT2306 Business logistics 6 STAT2307 Statistics in clinical medicine & bio-medical research 6 STAT2308 Statistical genetics 6 STAT2312 Data mining 6 STAT2313 Marketing engineering 6 STAT3306 Selected topics in statistics 6 STAT3811 Survival analysis 6

#### 3. Experiential learning requirement (6 credits) \*

Students must take at least one of the following forms of extra-ordinary learning experience to fulfill the experiential learning requirement:

- STAT2318 Directed studies in statistics 6

- STAT3319 Statistics project 12

- STAT3988 Statistics internship 6

- STAT3989 Essential IT skills for statistical and risk analysts (non-credit bearing)

- SCNC2005 Career development for science students (non-credit bearing)

- SCNC2988 Service learning internship (non-credit bearing)

- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)

- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (noncredit bearing)

\* If the extra-ordinary learning experience is fulfilled by non-credit bearing activities, students must take an additional 6-credit advanced level statistics course (STAT2XXX or STAT3XXX or STAT6XXX level). Students are not required to take EL if this Science major is taken as a second major but a 6-credit advanced level course in the second major must be taken to fulfill the credit requirement.

#### **Remarks:**

Major Title	Major in Statistics
Offered to students	2009-2010

admitted to Year 1 in

#### **Objectives:**

The Major in Statistics curriculum centres on the study of statistics, a scientific discipline characterized by the development and applications of analytic and quantitative tools which involve logical thinking, problem formulation, probability reasoning and intensive data analyses. The programme aims to equip students with powerful mathematical, analytic and computational skills, which are in great demand in practical areas where data are obtained for the purpose of finding information in support of decision making. It establishes for 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:

a. Students would 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)

b. Students would be able to 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. (by means of coursework, tutorial classes and/or project-based learning in the curriculum)

c. Equipped with hands-on experience in data analysis using commercial statistical software, students would 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)

d. Students would 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)

e. Through the understanding and application of statistical concepts and techniques, students would 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 experiential learning in the curriculum)

#### **Minimum Entry Requirement:**

A pass in AL Pure Mathematics or equivalent, or MATH0211 Basic applicable mathematics

#### Minimum Credit Requirement:

72 credits (18 credits introductory level, 54 credits advanced level courses including experiential learning requirement)

#### Impermissible Combination:

Major in Risk Management Minor in Risk Management; Statistics

#### Required courses (72 credits)

#### 1. Introductory level courses (18 credits)

STAT1301 Probability and statistics I 6 STAT1302 Probability and statistics II 6

Plus at least 6 credits of the following courses:

STAT1303 Data management 6 STAT1304 Design and analysis of sample surveys 6 STAT1323 Introduction to demographic and socio-economic statistics 6

#### 2. Advanced level courses (48 credits)

STAT2301 Linear statistical analysis 6 STAT3301 Time-series analysis 6 STAT3302 Multivariate data analysis 6 STAT3304 Computer-aided statistical modelling 6 Plus at least 24 credits from Lists A and B, among which at least 12 credits from List A:

List A:

STAT2302 Statistical inference 6 STAT2303 Probability modelling 6 STAT2308 Statistical genetics 6 STAT2312 Data mining 6 STAT2313 Marketing engineering 6 STAT3306 Selected topics in statistics 6 STAT3308 Financial engineering (note 1) OR STAT3303 Derivatives and risk management 6 STAT3316 Advanced probability 6 STAT3317 Computational statistics 6 STAT3322 Market risk analysis 6 STAT3811 Survival analysis 6 STAT3821 Financial economics II 6

List B:

STAT2304 Design and analysis of experiments 6 STAT2305 Quality control and Management 6 STAT2306 Business logistics 6 STAT2307 Statistics in clinical medicine & bio-medical research 6 STAT2309 The statistics of investment risk 6 STAT2310 Risk management and insurance 6 STAT2315 Practical mathematics for investment 6 STAT2320 (note 1) / STAT3320 Risk management and Basel II in banking and finance 6 STAT2801 Life contingencies 6 STAT2805 Credibility theory and loss distributions 6 STAT2812 Financial economics I 6

STAT3810 Risk theory 6

#### 3. Experiential learning requirement (6 credits) \*

Students must take at least one of the following forms of extra-ordinary learning experience to fulfill the experiential learning requirement:

- STAT2318 Directed studies in statistics 6
- STAT3319 Statistics project 12
- STAT3988 Statistics internship 6
- STAT3989 Essential IT skills for statistical and risk analysts (non-credit bearing)
- SCNC2005 Career development for science students (non-credit bearing)
- SCNC2988 Service learning internship (non-credit bearing)

- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)

- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (noncredit bearing)

\* If the extra-ordinary learning experience is fulfilled by non-credit bearing activities, students must take an additional 6-credit advanced level statistics course (STAT2XXX or STAT3XXX or STAT6XXX level). Students are not required to take EL if this Science major is taken as a second major but a 6-credit advanced level course in the second major must be taken to fulfill the credit requirement.

#### Notes:

1 Not available in 2010-2011 or thereafter.

#### **Remarks:**

# SECTION VI

### Science Minors on offer in 2012/13

## SCIENCE

#### SECTION VI Science Minors on offer in 2012/13

#### Minors offered by Science Faculty

#### **<u>Minors</u>** (16)

**Actuarial Studies** Astronomy Biochemistry Biology Biotechnology Chemistry Earth Sciences Ecology & Biodiversity Food & Nutritional Science General Science<sup>1</sup> Global Climate Change Mathematics Microbiology Physics **Risk Management Statistics** 

Notes: <sup>1</sup> General Science minor is only available for students outside the Faculty of Science

Minor Title	Minor in Actuarial Studies
Offered to students	2012-2013

Offered to students admitted to Year 1 in

**Objectives:** 

The Minor in Actuarial Studies aims to provide interested students with an introduction to the basic concepts and methodologies in Actuarial Science. The minor curriculum is designed particularly for students from different majors to enhance their interest in Actuarial Science and to strengthen their confidence and potential in solving mathematical, financial, economical and investment-related problems.

#### Learning Outcomes:

a. to 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)

b. to 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)

#### Minimum Entry Requirement:

AL Pure Mathematics or AS Mathematics and Statistics or equivalent

#### Minimum Credit Requirement:

36-42 credits (12-18 credits introductory level & 24 credits advanced level courses)

#### Impermissible Combination:

Nil

#### Required courses (36 or 42 credits)

#### 1. Introductory level courses (12 or 18 credits)

For students majoring in Risk Management or Statistics (12 credits)

STAT1323 Introduction to demographic and socio-economic statistics 6 STAT2303 Probability modelling 6 STAT2306 Business logistics 6 STAT2315 Practical mathematics for investment 6

For students minoring in Risk Management or Statistics (12 credits)

STAT1302 Probability and statistics II 6 STAT2303 Probability modelling 6 STAT2315 Practical mathematics for investment 6

For students not belonging to the above two categories (18 credits)

STAT1301 Probability and statistics I 6 STAT1302 Probability and statistics II 6 STAT1801 Probability and statistics: foundations of actuarial science 6 STAT2303 Probability modelling 6 STAT2315 Practical mathematics for investment 6

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

At least 24 credits of the following courses:

STAT2801 Life contingencies 6 STAT2805 Credibility theory and loss distributions 6 STAT2807 Corporate finance for actuarial science 6 STAT2812 Financial economics I 6 STAT3810 Risk theory 6 STAT3811 Survival analysis 6 STAT3821 Financial economics II 6

#### Remarks:

Minor Title	Minor in Actuarial Studies
Offered to students	2011-2012

Offered to students admitted to Year 1 in

**Objectives:** The Minor in Actuarial Studies aims to provide interested students with an introduction to the basic concepts and methodologies in Actuarial Science. The minor curriculum is designed particularly for students from different majors to enhance their interest in Actuarial Science and to strengthen their confidence and potential in solving mathematical, financial, economical and investment-related problems.

#### Learning Outcomes:

a. to 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)

b. to 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)

#### Minimum Entry Requirement:

AL Pure Mathematics or AS Mathematics and Statistics or equivalent

#### Minimum Credit Requirement:

36-42 credits (12-18 credits introductory level & 24 credits advanced level courses)

#### Impermissible Combination:

Nil

#### Required courses (36 or 42 credits)

#### 1. Introductory level courses (12 or 18 credits)

For students majoring in Risk Management or Statistics (12 credits)

STAT1323 Introduction to demographic and socio-economic statistics 6 STAT2303 Probability modelling 6 STAT2306 Business logistics 6 STAT2315 Practical mathematics for investment 6

For students minoring in Risk Management or Statistics (12 credits)

STAT1302 Probability and statistics II 6 STAT2303 Probability modelling 6 STAT2315 Practical mathematics for investment 6

For students not belonging to the above two categories (18 credits)

STAT1301 Probability and statistics I 6 STAT1302 Probability and statistics II 6 STAT1801 Probability and statistics: foundations of actuarial science 6 STAT2303 Probability modelling 6 STAT2315 Practical mathematics for investment 6

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

At least 24 credits of the following courses:

STAT2801 Life contingencies 6 STAT2805 Credibility theory and loss distributions 6 STAT2807 Corporate finance for actuarial science 6 STAT2812 Financial economics I 6 STAT3810 Risk theory 6 STAT3811 Survival analysis 6 STAT3821 Financial economics II 6

#### Remarks:

Minor Title	Minor in Actuarial Studies
Offered to students	2010-2011

Offered to students admitted to Year 1 in

Objectives:

The Minor in Actuarial Studies aims to provide interested students with an introduction to the basic concepts and methodologies in Actuarial Science. The minor curriculum is designed particularly for students from different majors to enhance their interest in Actuarial Science and to strengthen their confidence and potential in solving mathematical, financial, economical and investmentrelated problems.

#### Learning Outcomes:

a. to 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)

b. to 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)

#### Minimum Entry Requirement:

AL Pure Mathematics or AS Mathematics and Statistics or equivalent

#### Minimum Credit Requirement:

36-42 credits (12-18 credits introductory level & 24 credits advanced level courses)

#### Impermissible Combination:

Nil

#### Required courses (36 or 42 credits)

#### 1. Introductory level courses (12 or 18 credits)

For students majoring in Risk Management or Statistics (12 credits)

STAT1323 Introduction to demographic and socio-economic statistics 6 STAT2303 Probability modelling 6 STAT2306 Business logistics 6 STAT2315 Practical mathematics for investment 6

For students minoring in Risk Management or Statistics (12 credits)

STAT1302 Probability and statistics II 6 STAT2303 Probability modelling 6 STAT2315 Practical mathematics for investment 6

For students not belonging to the above two categories (18 credits)

STAT1301 Probability and statistics I 6 STAT1302 Probability and statistics II 6 STAT1801 Probability and statistics: foundations of actuarial science 6 STAT2303 Probability modelling 6 STAT2315 Practical mathematics for investment 6

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

At least 24 credits of the following courses:

STAT2801 Life contingencies 6 STAT2805 Credibility theory and loss distributions 6 STAT2807 Corporate finance for actuarial science 6 STAT2812 Financial economics I 6 STAT3810 Risk theory 6 STAT3811 Survival analysis 6 STAT3821 Financial economics II 6

#### Remarks:

Minor Title	Minor in Actuarial Studies

2009-2010

Offered to students admitted to Year 1 in

#### **Objectives:**

The Minor in Actuarial Studies aims to provide interested students with an introduction to the basic concepts and methodologies in Actuarial Science. The minor curriculum is designed particularly for students from different majors to enhance their interest in Actuarial Science and to strengthen their confidence and potential in solving mathematical, financial, economical and investment-related problems.

#### Learning Outcomes:

a. to 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)

b. to 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)

#### Minimum Entry Requirement:

AL Pure Mathematics or AS Mathematics and Statistics or equivalent

#### Minimum Credit Requirement:

36-42 credits (12-18 credits introductory level & 24 credits advanced level courses)

#### Impermissible Combination:

Nil

#### Required courses (36 or 42 credits)

#### 1. Introductory level courses (12 or 18 credits)

For students majoring in Risk Management or Statistics (12 credits)

STAT1323 Introduction to demographic and socio-economic statistics 6 STAT1802 Financial mathematics 6 STAT2303 Probability modelling 6 STAT2306 Business logistics 6

For students minoring in Risk Management or Statistics (12 credits)

STAT1302 Probability and statistics II 6 STAT1801 Probability and statistics: foundations of actuarial science 6 STAT1802 Financial mathematics 6 STAT2303 Probability modelling 6

For students not belonging to the above two categories (18 credits)

STAT1301 Probability and statistics I 6 STAT1302 Probability and statistics II 6 STAT1801 Probability and statistics: foundations of actuarial science 6 STAT1802 Financial mathematics 6 STAT2303 Probability modelling 6

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

At least 24 credits of the following courses:

STAT2801 Life contingencies 6 STAT2805 Credibility theory and loss distributions 6 STAT2807 Corporate finance for actuarial science 6 STAT2812 Financial economics I 6 STAT3810 Risk theory 6 STAT3811 Survival analysis 6 STAT3821 Financial economics II 6

#### Remarks:

Minor Title	Minor in Astronomy
Offered to students admitted to Year 1 in	2012-2013
a taste of the subject thro	intended to provide interested students a fundamental outlook on the subject. Students would acquire ugh a large selection of elective courses to allow them to pursue their interest in the subject and to veen the field of astronomy and other science disciplines.
	e to identify and describe astrophysical phenomena with fundamental knowledge in physics. and tutorial classes in the curriculum)
theoretical or observationa	developed their scientific intuition, abilities and techniques to tackle astrophysical problems either I in nature. tutorial classes, and opportunities of field activities in the curriculum)
	e to communicate and collaborate with people effectively in scientific issues. ets, tutorial sessions and presentation opportunities in the curriculum)
Minimum Entry Requiren	nent:
Minimum Credit Require 36 credits (12 credits intro	ment: ductory level & 24 credits advanced levelcourses)
Impermissible Combinat Major in Astronomy	ion:
Required courses (36 c	redits) (note 1)
1. Introductory level co	urses (12 credits)
PHYS0003 Nature of the	universe 6
Plus at least 6 credits of	introductory level Physics course (PHYS0XXX or PHYS1XXX level) (note 2 & 3)
2. Advanced level cour	ses (24 credits)
At least 24 credits of adv 12 credits are of the follo	anced level Physics courses (PHYS2XXX or PHYS3XXX or PHYS6XXX) level, out of which at least wing courses:
PHYS2021 The physical PHYS2022 Observationa PHYS3031 Astrophysics PHYS3033 General relat PHYS3034 Cosmology 6 PHYS3040 Stellar physic	al astronomy 6 6 ivity 6
1 For students having n introductory or advanced le 2 Students without AL/AS advanced level Physics co	rtment website http://www.physics.hku.hk for suggested curriculum. najor/minor combination of Physics / Astronomy, or Materials Science / Astronomy, any single evel Physics course can be used to satisfy a major or minor requirement only once. S Physics are strongly advised to take PHYS1417 to allow for maximum flexibility in selection of purses. Students without HKCEE Physics are strongly advised to take PHYS0114 and PHYS0115 and purses.

PHYS1417 to allow for maximum flexibility in selection of advanced level Physics courses. 3 Students are advised to take at least one of the following courses: PHYS1414, PHYS1415, or PHYS1417 toallow for maximum flexibility in selection for advanced level Physics courses.

#### Remarks:

	Minor in Astronomy
Offered to students admitted to Year 1 in	2011-2012
a taste of the subject throu	ntended to provide interested students a fundamental outlook on the subject. Students would acquire gh a large selection of elective courses to allow them to pursue their interest in the subject and to sen the field of astronomy and other science disciplines.
	to identify and describe astrophysical phenomena with fundamental knowledge in physics. nd tutorial classes in the curriculum)
theoretical or observational	eveloped their scientific intuition, abilities and techniques to tackle astrophysical problems either in nature. utorial classes, and opportunities of field activities in the curriculum)
	to communicate and collaborate with people effectively in scientific issues. s, tutorial sessions and presentation opportunities in the curriculum)
Minimum Entry Requirement	ent:
Minimum Credit Requirem	ent: uctory level & 24 credits advanced levelcourses)
Υ.	
Impermissible Combination Major in Astronomy	<i>л</i> .
Major in Astronomy	edits) (note 1)
Major in Astronomy Required courses (36 cro 1. Introductory level cou Either [ PHYS0001 Nature of the	edits) (note 1) rses (12 credits) universe I: introduction to observational astronomy and the solar system (note 4) (3) AND universe II: stars, galaxies and cosmology for beginners (note 4) (3) ]
Major in Astronomy Required courses (36 cro 1. Introductory level cou Either [ PHYS0001 Nature of the PHYS0002 Nature of the OR PHYS0003 Nature of the	edits) (note 1) rses (12 credits) universe I: introduction to observational astronomy and the solar system (note 4) (3) AND universe II: stars, galaxies and cosmology for beginners (note 4) (3) ]
Major in Astronomy Required courses (36 cross 1. Introductory level courses Either [ PHYS0001 Nature of the PHYS0002 Nature of the OR PHYS0003 Nature of the PHYS0003 Nature of the	edits) (note 1) rses (12 credits) universe I: introduction to observational astronomy and the solar system (note 4) (3) AND universe II: stars, galaxies and cosmology for beginners (note 4) (3) ] the universe 6 utroductory level Physics course (PHYS0XXX or PHYS1XXX level) (note 2 & 3)
Major in Astronomy Required courses (36 cross 1. Introductory level courses Either [ PHYS0001 Nature of the PHYS0002 Nature of the OR PHYS0003 Nature of the Plus at least 6 credits of in 2. Advanced level course	edits) (note 1) rses (12 credits) universe I: introduction to observational astronomy and the solar system (note 4) (3) AND universe II: stars, galaxies and cosmology for beginners (note 4) (3) ] the universe 6 itroductory level Physics course (PHYS0XXX or PHYS1XXX level) (note 2 & 3) es (24 credits) nced level Physics courses (PHYS2XXX or PHYS3XXX or PHYS6XXX) level, out of which at least

Refer to the Physics Department website http://www.physics.hku.hk for suggested curriculum.

1 For students having major/minor combination of Physics / Astronomy, or Materials Science / Astronomy, any single introductory or advanced level Physics course can be used to satisfy a major or minor requirement only once.

2 Students without AL/AS Physics are strongly advised to take PHYS1417 to allow for maximum flexibility in selection of advanced level Physics courses. Students without HKCEE Physics are strongly advised to take PHYS0114 and PHYS0115 and PHYS1417 to allow for maximum flexibility in selection of advanced level Physics courses.

3 Students are advised to take at least one of the following courses: PHYS1414, PHYS1415, or PHYS1417 toallow for maximum flexibility in selection for advanced level Physics courses.

4 Not available in 2012-2013 or thereafter.

#### Remarks:

	Minor in Astronomy
Offered to students admitted to Year 1 in	2010-2011
a taste of the subject throug	ntended to provide interested students a fundamental outlook on the subject. Students would acquir gh a large selection of elective courses to allow them to pursue their interest in the subject and to en the field of astronomy and other science disciplines.
	o identify and describe astrophysical phenomena with fundamental knowledge in physics. Id tutorial classes in the curriculum)
heoretical or observational in	eveloped their scientific intuition, abilities and techniques to tackle astrophysical problems eithe n nature. Itorial classes, and opportunities of field activities in the curriculum)
. Students should be able to	o communicate and collaborate with people effectively in scientific issues. , tutorial sessions and presentation opportunities in the curriculum)
/inimum Entry Requireme ∖IL	ent:
mpermissible Combination Major in Astronomy Required courses (36 cre	edits) (note 1)
1. Introductory level cour	ses (12 credits)
	universe I: introduction to observational astronomy and the solar system (note 4) (3) AND niverse II: stars, galaxies and cosmology for beginners (note 4) (3) ] he universe 6
Plus at least 6 credits of int	troductory level Physics course (PHYS0XXX or PHYS1XXX level) (note 2 & 3)
2. Advanced level course	es (24 credits)
At least 24 credits of advan 12 credits are of the following	nced level Physics courses (PHYS2XXX or PHYS3XXX or PHYS6XXX) level, out of which at least ing courses:
PHYS2021 The physical ur PHYS2022 Observational a	

Refer to the Physics Department website http://www.physics.hku.hk for suggested curriculum. 1 For students having major/minor combination of Physics / Astronomy, or Materials Science / Astronomy, any single

1 For students having major/minor combination of Physics / Astronomy, or Materials Science / Astronomy, any single introductory or advanced level Physics course can be used to satisfy a major or minor requirement only once.

2 Students without AL/AS Physics are strongly advised to take PHYS1417 to allow for maximum flexibility in selection of advanced level Physics courses. Students without HKCEE Physics are strongly advised to take PHYS0114 and PHYS0115 and PHYS1417 to allow for maximum flexibility in selection of advanced level Physics courses.

3 Students are advised to take at least one of the following courses: PHYS1414, PHYS1415, or PHYS1417 toallow for maximum flexibility in selection for advanced level Physics courses.

4 Not available in 2012-2013 or thereafter.

#### Remarks:

	Minor in Astronomy
Difered to students admitted to Year 1 in	2009-2010
a taste of the subject throug	tended to provide interested students a fundamental outlook on the subject. Students would acqui th a large selection of elective courses to allow them to pursue their interest in the subject and the en the field of astronomy and other science disciplines.
	o identify and describe astrophysical phenomena with fundamental knowledge in physics. d tutorial classes in the curriculum)
heoretical or observational ir	eveloped their scientific intuition, abilities and techniques to tackle astrophysical problems eithen n nature. torial classes, and opportunities of field activities in the curriculum)
. Students should be able to	o communicate and collaborate with people effectively in scientific issues. , tutorial sessions and presentation opportunities in the curriculum)
Ainimum Entry Requiremen	nt:
Ainimum Credit Requirements 66 credits (12 credits introduce	ent: ctory level & 24 credits advanced levelcourses)
mpermissible Combinatior Aajor in Astronomy	n:
Required courses (36 cree	dits) (note 1)
1. Introductory level cours	ses (12 credits)
	universe I: introduction to observational astronomy and the solar system (note 4) (3) AND niverse II: stars, galaxies and cosmology for beginners (note 4) (3) ] ne universe 6
Plus at least 6 credits of inte	roductory level Physics course (PHYS0XXX or PHYS1XXX level) (note 2 & 3)
2. Advanced level courses	s (24 credits)
At least 24 credits of advan 12 credits are of the following	nced level Physics courses (PHYS2XXX or PHYS3XXX or PHYS6XXX) level, out of which at least ng courses:
	niverse 6

Refer to the Physics Department website http://www.physics.hku.hk for suggested curriculum.

1 For students having major/minor combination of Physics / Astronomy, or Materials Science / Astronomy, any single introductory or advanced level Physics course can be used to satisfy a major or minor requirement only once.

2 Students without AL/AS Physics are strongly advised to take PHYS1417 to allow for maximum flexibility in selection of advanced level Physics courses. Students without HKCEE Physics are strongly advised to take PHYS0114 and PHYS0115 and PHYS1417 to allow for maximum flexibility in selection of advanced level Physics courses.

3 Students are advised to take at least one of the following courses: PHYS1414, PHYS1415, or PHYS1417 toallow for maximum flexibility in selection for advanced level Physics courses.

4 Not available in 2012-2013 or thereafter.

#### Remarks:

Offered to students admitted to Year 1 in

**Objectives:** 

The Minor in Biochemistry offered by the Department of 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 selects courses that will compliment the individual student's Major.

#### Learning Outcomes:

a. Students would be able to 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)

2012-2013

b. Students would be able to 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)

c. Students would be able to 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)

# Minimum Entry Requirement:

AL Biology or AS Chemistry or a pass in CHEM0008 Fundamental chemistry or equivalent

# Minimum Credit Requirement:

36 credits (12 credits introductory level & 24 credits advanced level courses)

# Impermissible Combination:

Major in Biochemistry

#### Required courses (36 credits)

# 1. Introductory level courses (12 credits)

BIOC1001 Basic biochemistry 6 BIOC1003 Introduction to molecular genetics 6

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

BIOL2301 Protein structure and function 6

Plus at least 6 credits of BIOC2XXX level courses and at least 12 credits of BIOC3XXX level courses, subject to prerequisite requirements.

#### Remarks:

n Biochemistry
i

Offered to students admitted to Year 1 in

#### **Objectives:**

The Minor in Biochemistry offered by the Department of 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 selects courses that will compliment the individual student's Major.

#### Learning Outcomes:

a. Students would be able to 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)

2011-2012

b. Students would be able to 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)

c. Students would be able to 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)

# Minimum Entry Requirement:

AL Biology or AS Chemistry or a pass in CHEM0008 Fundamental chemistry or equivalent

# Minimum Credit Requirement:

36 credits (12 credits introductory level & 24 credits advanced level courses)

# Impermissible Combination:

Major in Biochemistry

#### Required courses (36 credits)

# 1. Introductory level courses (12 credits)

BIOC1001 Basic biochemistry 6 BIOC1003 Introduction to molecular genetics 6

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

BIOL2301 Protein structure and function 6

Plus at least 6 credits of BIOC2XXX level courses and at least 12 credits of BIOC3XXX level courses, subject to prerequisite requirements.

#### Remarks:

Minor Title Minor i	n Biochemistry
---------------------	----------------

Offered to students 2010-2011 admitted to Year 1 in

#### Objectives:

The Minor in Biochemistry offered by the Department of 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 selects courses that will compliment the individual student's Major.

#### Learning Outcomes:

a. Students would be able to 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)

b. Students would be able to 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)

c. Students would be able to 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)

# Minimum Entry Requirement:

AL Biology or AS Chemistry or a pass in CHEM0008 Fundamental chemistry or equivalent

# Minimum Credit Requirement:

36 credits (12 credits introductory level & 24 credits advanced level courses)

# Impermissible Combination:

Major in Biochemistry

#### Required courses (36 credits)

# 1. Introductory level courses (12 credits)

BIOC1001 Basic biochemistry 6 BIOC1003 Introduction to molecular genetics 6

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

BIOL2301 Protein structure and function 6

Plus at least 6 credits of BIOC2XXX level courses and at least 12 credits of BIOC3XXX level courses, subject to prerequisite requirements.

#### Remarks:

Minor Title Min	nor in Biochemistry
-----------------	---------------------

Offered to students admitted to Year 1 in

#### **Objectives:**

The Minor in Biochemistry offered by the Department of 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 selects courses that will compliment the individual student's Major.

#### Learning Outcomes:

a. Students would be able to 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)

2009-2010

b. Students would be able to 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)

c. Students would be able to 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)

### Minimum Entry Requirement:

AL Biology or AS Chemistry or a pass in CHEM0008 Fundamental chemistry or equivalent

# Minimum Credit Requirement:

36 credits (12 credits introductory level & 24 credits advanced level courses)

# Impermissible Combination:

Major in Biochemistry

#### Required courses (36 credits)

# 1. Introductory level courses (12 credits)

BIOC1001 Basic biochemistry 6 BIOC1003 Introduction to molecular genetics 6

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

BIOL2301 Protein structure and function 6

Plus at least 6 credits of BIOC2XXX level courses and at least 12 credits of BIOC3XXX level courses, subject to prerequisite requirements.

#### Remarks:

Minor Title	Minor in Biology
Offered to students	2012-2013

Objectives:

#### The aim of this minor is to provide students with a gratifying learning experience in biology. Biology is a multidisciplinary broadbased subject that forms the foundation for all life sciences in modern days. The curriculum places strong emphasis in major aspects of biology including genetics, evolution, and molecular, cellular and organismic biosystems. The program provides trainings in fundamental laboratory skills with complementary core courses. In addition, students also have the flexibility to choose from a variety of elective courses so that they may specialize in certain discipline of their own interests. Specialization is currently possible in 1) genetics and evolution, 2) molecular and cellular biology, and 3) physiology and systems biology.

### Learning Outcomes:

a. Students will be able to develop scientific inquiry and critical thinking skills, including the ability to understand, analyze, and evaluate problems in order to develop solutions.

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

b. Students will be able to understand broader scientific concepts, and be able to relate and apply these to scientific issues of significance in their daily lives and also of more global significance.
 (by means of coursework and laboratory-based learning in the curriculum)

c. Students will be able to improve their oral and written communication skills, and gain confidence in interacting with their peers and professors individually and as part of a team. (by means of group projects, tutorial sessions and presentation opportunities in the curriculum)

d. Students will be able to understand and apply key concepts in genetics, evolution, molecular biology, biochemistry, cell biology, physiology and ecosystem.

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

#### Minimum Entry Requirement:

AL Biology or equivalent or a pass in BIOL0126 Fundamentals of biology

# Minimum Credit Requirement:

36 credits (12 credits introductory level & 24 credits advanced level courses)

Impermissible Combination:

Major in Biology

#### Required courses (36 credits)

# 1. Introductory level courses (12 credits)

At least 12 credits of the following courses:

BIOL0604 Evolutionary diversity 6 BIOL1122 Functional biology 6 BIOL1133 Biological sciences laboratory course 6

(Students are strongly recommended to take "BIOL1125 Introduction to biochemistry" as an elective)

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

BIOL2303 Molecular biology 6

Plus at least 18 credits of advanced level courses (BIOL2XXX and BIOL3XXX level)

Students are recommended to take the following courses:

BIOL2112 Plant physiology 6 BIOL2115 Cell biology & cell technology 6 BIOL2119 Genetics 6 BIOL2207 Endocrinology: human physiology II 6 BIOL2210 Evolution 6 BIOL2215 Animal physiology & environmental adaptation 6 BIOL2218 Human physiology 6 BIOL2611 Systematics & phylogenetics 6 BIOL3325 Molecular phylogenetics and evolution 6

#### Remarks:

Minor Title	Minor in Biology
Offered to students	2011-2012

Objectives:

admitted to Year 1 in

The aim of this minor is to provide students with a gratifying learning experience in biology. Biology is a multidisciplinary broadbased subject that forms the foundation for all life sciences in modern days. The curriculum places strong emphasis in major aspects of biology including genetics, evolution, and molecular, cellular and organismic biosystems. The program provides trainings in fundamental laboratory skills with complementary core courses. In addition, students also have the flexibility to choose from a variety of elective courses so that they may specialize in certain discipline of their own interests. Specialization is currently possible in 1) genetics and evolution, 2) molecular and cellular biology, and 3) physiology and systems biology.

#### Learning Outcomes:

a. Students will be able to develop scientific inquiry and critical thinking skills, including the ability to understand, analyze, and evaluate problems in order to develop solutions.

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

b. Students will be able to understand broader scientific concepts, and be able to relate and apply these to scientific issues of significance in their daily lives and also of more global significance.
 (by means of coursework and laboratory-based learning in the curriculum)

c. Students will be able to improve their oral and written communication skills, and gain confidence in interacting with their peers and professors individually and as part of a team. (by means of group projects, tutorial sessions and presentation opportunities in the curriculum)

d. Students will be able to understand and apply key concepts in genetics, evolution, molecular biology, biochemistry, cell biology, physiology and ecosystem.

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

#### Minimum Entry Requirement:

AL Biology or equivalent or a pass in BIOL0126 Fundamentals of biology

# Minimum Credit Requirement:

36 credits (12 credits introductory level & 24 credits advanced level courses)

Impermissible Combination:

Major in Biology

#### Required courses (36 credits)

## 1. Introductory level courses (12 credits)

At least 12 credits of the following courses:

BIOL0604 Evolutionary diversity 6 BIOL1122 Functional biology 6 BIOL1133 Biological sciences laboratory course 6

(Students are strongly recommended to take "BIOL1125 Introduction to biochemistry" as an elective)

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

BIOL2303 Molecular biology 6

Plus at least 18 credits of advanced level courses (BIOL2XXX and BIOL3XXX level)

Students are recommended to take the following courses:

BIOL2112 Plant physiology 6 BIOL2115 Cell biology & cell technology 6 BIOL2116 Genetics I (note 1) 6 BIOL2117 Genetics II (note 1) 6 BIOL2207 Endocrinology: human physiology II 6 BIOL2210 Evolution 6 BIOL2215 Animal physiology: functional interactions with environment OR Animal physiology & environmental adaptation 6 BIOL2218 Human physiology 6 BIOL2611 Systematics & phylogenetics 6 BIOL3325 Molecular phylogenetics and evolution 6

Notes:

1. Starting from the academic year 2012-2013, students should take BIOL2119 Genetics which is equivalent to BIOL2116 Genetics I or BIOL2117 Genetics II.

Minor Title	Minor in Biology
Offered to students	2010-2011

# Objectives:

admitted to Year 1 in

The aim of this minor is to provide students with a gratifying learning experience in biology. Biology is a multidisciplinary broadbased subject that forms the foundation for all life sciences in modern days. The curriculum places strong emphasis in major aspects of biology including genetics, evolution, and molecular, cellular and organismic biosystems. The program provides trainings in fundamental laboratory skills with complementary core courses. In addition, students also have the flexibility to choose from a variety of elective courses so that they may specialize in certain discipline of their own interests. Specialization is currently possible in 1) genetics and evolution, 2) molecular and cellular biology, and 3) physiology and systems biology.

#### Learning Outcomes:

a. Students will be able to develop scientific inquiry and critical thinking skills, including the ability to understand, analyze, and evaluate problems in order to develop solutions.

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

b. Students will be able to understand broader scientific concepts, and be able to relate and apply these to scientific issues of significance in their daily lives and also of more global significance.
 (by means of coursework and laboratory-based learning in the curriculum)

c. Students will be able to improve their oral and written communication skills, and gain confidence in interacting with their peers and professors individually and as part of a team. (by means of group projects, tutorial sessions and presentation opportunities in the curriculum)

d. Students will be able to understand and apply key concepts in genetics, evolution, molecular biology, biochemistry, cell biology, physiology and ecosystem.

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

#### Minimum Entry Requirement:

AL Biology or equivalent or a pass in BIOL0126 Fundamentals of biology

# Minimum Credit Requirement:

36 credits (12 credits introductory level & 24 credits advanced level courses)

Impermissible Combination:

Major in Biology

#### Required courses (36 credits)

## 1. Introductory level courses (12 credits)

At least 12 credits of the following courses:

BIOL0604 Evolutionary diversity 6 BIOL1122 Functional biology 6 BIOL1133 Biological sciences laboratory course 6

(Students are strongly recommended to take "BIOL1125 Introduction to biochemistry" as an elective)

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

BIOL2303 Molecular biology 6

Plus at least 18 credits of advanced level courses (BIOL2XXX and BIOL3XXX level)

Students are recommended to take the following courses:

BIOL2112 Plant physiology 6 BIOL2115 Cell biology & cell technology 6 BIOL2116 Genetics I (note 1) 6 BIOL2117 Genetics II (note 1) 6 BIOL2207 Endocrinology: human physiology II 6 BIOL2210 Evolution 6 BIOL2215 Animal physiology: functional interactions with environment OR Animal physiology & environmental adaptation 6 BIOL2218 Human physiology 6 BIOL2611 Systematics & phylogenetics 6 BIOL3325 Molecular phylogenetics and evolution 6

Notes:

1. Starting from the academic year 2012-2013, students should take BIOL2119 Genetics which is equivalent to BIOL2116 Genetics I or BIOL2117 Genetics II.

#### Remarks:

Minor Title	Minor in Biology
Offered to students	2009-2010

#### **Objectives:**

The aim of this minor is to provide students with a gratifying learning experience in biology. Biology is a multidisciplinary broadbased subject that forms the foundation for all life sciences in modern days. The curriculum places strong emphasis in major aspects of biology including genetics, evolution, and molecular, cellular and organismic biosystems. The program provides trainings in fundamental laboratory skills with complementary core courses. In addition, students also have the flexibility to choose from a variety of elective courses so that they may specialize in certain discipline of their own interests. Specialization is currently possible in 1) genetics and evolution, 2) molecular and cellular biology, and 3) physiology and systems biology.

# Learning Outcomes:

a. Students will be able to develop scientific inquiry and critical thinking skills, including the ability to understand, analyze, and evaluate problems in order to develop solutions.

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

b. Students will be able to understand broader scientific concepts, and be able to relate and apply these to scientific issues of significance in their daily lives and also of more global significance.
 (by means of coursework and laboratory-based learning in the curriculum)

c. Students will be able to improve their oral and written communication skills, and gain confidence in interacting with their peers and professors individually and as part of a team. (by means of group projects, tutorial sessions and presentation opportunities in the curriculum)

d. Students will be able to understand and apply key concepts in genetics, evolution, molecular biology, biochemistry, cell biology, physiology and ecosystem.

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

#### Minimum Entry Requirement:

AL Biology or equivalent or a pass in BIOL0126 Fundamentals of biology

# Minimum Credit Requirement:

36 credits (12 credits introductory level & 24 credits advanced level courses)

Impermissible Combination:

Major in Biology

#### Required courses (36 credits)

## 1. Introductory level courses (12 credits)

At least 12 credits of the following courses:

BIOL0604 Evolutionary diversity 6 BIOL1122 Functional biology 6 BIOL1133 Biological sciences laboratory course 6

(Students are strongly recommended to take "BIOL1125 Introduction to biochemistry" as an elective)

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

BIOL2303 Molecular biology 6

Plus at least 18 credits of advanced level courses (BIOL2XXX and BIOL3XXX level)

Students are recommended to take the following courses:

BIOL2112 Plant physiology 6 BIOL2115 Cell biology & cell technology 6 BIOL2116 Genetics I (note 1) 6 BIOL2117 Genetics II (note 1) 6 BIOL2207 Endocrinology: human physiology II 6 BIOL2210 Evolution 6 BIOL2215 Animal physiology OR Animal physiology: functional interactions with environment OR Animal physiology & environmental adaptation 6 BIOL2611 Systematics & phylogenetics 6

#### Notes:

1. Starting from the academic year 2012-2013, students should take BIOL2119 Genetics which is equivalent to BIOL2116 Genetics I or BIOL2117 Genetics II.

#### 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 major or/and minor in order to satisfy the degree graduation requirements. Courses which appear in 2 or more majors or minors will only be counted once.

	Minor in Biotechnology
Offered to students admitted to Year 1 in	2012-2013
business sections and our o	aimed to provide students a fundamental understanding of biotechnology which is relevant to mar daily life. Students will learn the scientific principles underlying current biotechnological advances ar chnology business and advancements.
	technical and knowledge-based skills in biotechnology. nd laboratory-based learning in the curriculum)
	of critical inquiry, teamwork, and effective communication. s, tutorial classes and presentation opportunities in the curriculum)
	e the issues and concerns fundamental to the field. nd laboratory-based learning in the curriculum)
Minimum Entry Requirem AL Biology or equivalent or	<b>ent:</b> a pass in BIOL0126 Fundamentals of biology
Minimum Credit Requiren 36 credits (12 credits introd	nent: uctory level & 24 credits advanced level courses)
mpermissible Combination	on:
Required courses (36 cr 1. Introductory level cou	
	irses (12 credits)
1. Introductory level cou	ollowing courses: ogy 6 biochemistry 6
1. Introductory level council At least 12 credits of the f BIOL1122 Functional biological BIOL1125 Introduction to	ollowing courses: ogy 6 biochemistry 6 hces laboratory course 6
1. Introductory level cou At least 12 credits of the f BIOL1122 Functional biol BIOL1125 Introduction to BIOL1133 Biological scien	ollowing courses: ogy 6 biochemistry 6 nces laboratory course 6 es (24 credits)
1. Introductory level cou At least 12 credits of the f BIOL1122 Functional biol BIOL1125 Introduction to BIOL1133 Biological scier 2. Advanced level cours	arses (12 credits) ollowing courses: ogy 6 biochemistry 6 nces laboratory course 6 es (24 credits) ngy 6
1. Introductory level cou At least 12 credits of the final BIOL1122 Functional biolo BIOL1125 Introduction to BIOL1133 Biological scient 2. Advanced level cours BIOL2303 Molecular biolo Plus at least 18 credits of BIOL2111 Molecular micro BIOL2119 Genetics 6 BIOL2203 Reproduction 8 BIOL2205 Immunology 6	arses (12 credits) ollowing courses: ogy 6 biochemistry 6 hces laboratory course 6 es (24 credits) ogy 6 the following courses: obiology 6 & reproductive biotechnology 6
1. Introductory level cou At least 12 credits of the f BIOL1122 Functional biol BIOL1125 Introduction to BIOL1125 Introduction to BIOL1133 Biological scien 2. Advanced level cours BIOL2303 Molecular biolo Plus at least 18 credits of BIOL2111 Molecular micr BIOL2119 Genetics 6 BIOL2203 Reproduction 8 BIOL2205 Immunology 6 BIOL2302 Fermentation to BIOL3204 General virology BIOL3307 Biotechnology BIOL3316 Plant biotechnology	irrses (12 credits)         ollowing courses:         ogy 6         biochemistry 6         hcces laboratory course 6         es (24 credits)         ogy 6         the following courses:         obiology 6         & reproductive biotechnology 6         echnology 6         yp 6         iology and applied immunology 6         iology 6         biology 6
1. Introductory level cou At least 12 credits of the f BIOL1122 Functional biolo BIOL1125 Introduction to BIOL1133 Biological scien 2. Advanced level cours BIOL2303 Molecular biolo Plus at least 18 credits of BIOL2111 Molecular micro BIOL2119 Genetics 6 BIOL2203 Reproduction 8 BIOL2205 Immunology 6 BIOL2302 Fermentation to BIOL3214 General virolog BIOL3219 Clinical microb BIOL3307 Biotechnology BIOL3315 Animal biotech	irrses (12 credits)         ollowing courses:         ogy 6         biochemistry 6         hcces laboratory course 6         es (24 credits)         ogy 6         the following courses:         obiology 6         & reproductive biotechnology 6         echnology 6         yp 6         iology and applied immunology 6         iology 6         biology 6

	Minor in Biotechnology
Offered to students admitted to Year 1 in	2011-2012
business sections and ou	is aimed to provide students a fundamental understanding of biotechnology which is relevant to many r daily life. Students will learn the scientific principles underlying current biotechnological advances and technology business and advancements.
	ic technical and knowledge-based skills in biotechnology. and laboratory-based learning in the curriculum)
	ls of critical inquiry, teamwork, and effective communication. cts, tutorial classes and presentation opportunities in the curriculum)
	ibe the issues and concerns fundamental to the field. and laboratory-based learning in the curriculum)
Minimum Entry Require	ment: or a pass in BIOL0126 Fundamentals of biology
Minimum Credit Require 36 credits (12 credits intro	ement: oductory level & 24 credits advanced level courses)
Impermissible Combina Major in Biotechnology	tion:
Required courses (36	credits)
1. Introductory level co	
At least 12 credits of the	e following courses:
BIOL1122 Functional bi BIOL1125 Introduction t BIOL1133 Biological sci	to biochemistry 6
2. Advanced level cou	
2. Advanced level courses BIOL2303 Molecular bio	rses (24 credits)
BIOL2303 Molecular bic	rses (24 credits) blogy 6
BIOL2303 Molecular bio Plus at least 18 credits o BIOL2111 Molecular mi BIOL2116 Genetics I (no BIOL2203 Reproduction	rses (24 credits) blogy 6 of the following courses: crobiology 6 ote 1) OR BIOL2119 Genetics 6 n & reproductive biotechnology 6
BIOL2303 Molecular bio Plus at least 18 credits of BIOL2111 Molecular mi BIOL2116 Genetics I (m BIOL2203 Reproduction BIOL2205 Immunology BIOL2302 Fermentation BIOL3214 General virol	rses (24 credits) blogy 6 of the following courses: crobiology 6 ote 1) OR BIOL2119 Genetics 6 h & reproductive biotechnology 6 6 h technology 6 ogy 6 bbiology and applied immunology 6
BIOL2303 Molecular bio Plus at least 18 credits of BIOL2111 Molecular mi BIOL2116 Genetics I (m BIOL2203 Reproduction BIOL2205 Immunology BIOL2302 Fermentation BIOL3214 General virol BIOL3219 Clinical micro	rses (24 credits) blogy 6 of the following courses: crobiology 6 ote 1) OR BIOL2119 Genetics 6 h & reproductive biotechnology 6 6 h technology 6 ogy 6 bbiology and applied immunology 6 hy industry 6 chnology 6 biology 7 biology 7
BIOL2303 Molecular bid Plus at least 18 credits of BIOL2111 Molecular mi BIOL2116 Genetics I (m BIOL2203 Reproduction BIOL2205 Immunology BIOL2302 Fermentation BIOL3214 General virol BIOL3219 Clinical micro BIOL3307 Biotechnolog BIOL3315 Animal biotech	rses (24 credits) blogy 6 of the following courses: crobiology 6 ote 1) OR BIOL2119 Genetics 6 h & reproductive biotechnology 6 6 h technology 6 ogy 6 bbiology and applied immunology 6 hy industry 6 chnology 6 biology 7 biology 7
BIOL2303 Molecular bid Plus at least 18 credits of BIOL2111 Molecular mi BIOL2116 Genetics I (m BIOL2203 Reproduction BIOL2205 Immunology BIOL2302 Fermentation BIOL3214 General virol BIOL3219 Clinical micro BIOL3307 Biotechnolog BIOL3315 Animal biotech BIOL3316 Plant biotech BIOL3317 Microbial biot	rses (24 credits) blogy 6 of the following courses: crobiology 6 ote 1) OR BIOL2119 Genetics 6 h & reproductive biotechnology 6 6 h technology 6 ogy 6 bbiology and applied immunology 6 by industry 6 chnology 6 innology 6

Minor Title	Minor in Biotechnology
Offered to students admitted to Year 1 in	2010-2011
business sections and our	is aimed to provide students a fundamental understanding of biotechnology which is relevant to many r daily life. Students will learn the scientific principles underlying current biotechnological advances and echnology business and advancements.
	c technical and knowledge-based skills in biotechnology. and laboratory-based learning in the curriculum)
	s of critical inquiry, teamwork, and effective communication. ets, tutorial classes and presentation opportunities in the curriculum)
	be the issues and concerns fundamental to the field. and laboratory-based learning in the curriculum)
Minimum Entry Requirer AL Biology or equivalent o	<b>nent:</b> or a pass in BIOL0126 Fundamentals of biology
Minimum Credit Require 36 credits (12 credits intro	ment: ductory level & 24 credits advanced level courses)
Impermissible Combinat Major in Biotechnology	ion:
1. Introductory level co At least 12 credits of the BIOL1122 Functional bio BIOL1125 Introduction to BIOL1133 Biological scie	following courses:
2. Advanced level cour	ses (24 credits)
BIOL2303 Molecular bio	logy 6
Plus at least 18 credits o	of the following courses:
BIOL2203 Reproduction BIOL2205 Immunology 6 BIOL2302 Fermentation BIOL3214 General virolo	bite 1) OR BIOL2119 Genetics 6 & reproductive biotechnology 6 technology 6 biology and applied immunology 6 y industry 6 thnology 6
Notes: 1. Starting from the acad Genetics I.	demic year 2012-2013, students should take BIOL2119 Genetics which is equivalent to BIOL2116

Minor Title	Minor in Biotechnology
Offered to students admitted to Year 1 in	2009-2010
business sections and our	is aimed to provide students a fundamental understanding of biotechnology which is relevant to many r daily life. Students will learn the scientific principles underlying current biotechnological advances and echnology business and advancements.
	ic technical and knowledge-based skills in biotechnology. and laboratory-based learning in the curriculum)
	s of critical inquiry, teamwork, and effective communication. cts, tutorial classes and presentation opportunities in the curriculum)
	be the issues and concerns fundamental to the field. and laboratory-based learning in the curriculum)
Minimum Entry Required AL Biology or equivalent of	ment: or a pass in BIOL0126 Fundamentals of biology
Minimum Credit Require 36 credits (12 credits intro	ement: aductory level & 24 credits advanced level courses)
Impermissible Combinate Major in Biotechnology	tion:
Required courses (36 o	credits)
1. Introductory level co	ourses (12 credits)
At least 12 credits of the	following courses:
BIOL1122 Functional bio BIOL1125 Introduction to BIOL1133 Biological science	
2. Advanced level cour	rses (24 credits)
BIOL2303 Molecular bio	logy 6
Plus at least 18 credits of	of the following courses:
BIOL2111 Molecular mid	crobiology 6
BIOL2116 Genetics I (no	ote 1) OR BIOL2119 Genetics 6
BIOL2203 Reproduction BIOL2205 Immunology (	e k reproductive biotechnology 6
BIOL2302 Fermentation	technology 6
BIOL2515 Food microbio	
BIOL3214 General virolo	logy and nutrigenomics 6
BIOL3219 Clinical micro	biology and applied immunology 6
BIOL3307 Biotechnolog	
BIOL3315 Animal biotec BIOL3316 Plant biotech	
BIOL3317 Microbial biot	
Notes:	
	demic year 2012-2013, students should take BIOL2119 Genetics which is equivalent to BIOL2116
Remarks: Important! Ultimate respo	onsibility rests with students to ensure that the required pre-requisites and co-requisite of selected

	Minor in Chemistry
Offered to students admitted to Year 1 in	2012-2013
concepts of chemistry. T	aimed to provide students who are interested in chemistry with an introduction to the fundament ne minor curriculum is designed to provide students from different science majors with a high degree ses to enhance their knowledge and interest in chemistry.
	y the basic concepts of chemistry; and laboratory-based learning in the curriculum)
<ul> <li>to apply chemistry cond by means of coursework</li> </ul>	cepts in other subjects; and laboratory-based learning in the curriculum)
	ncepts to complement their major of study. and laboratory-based learning in the curriculum)
Minimum Entry Require	ment: CHEM0008 Fundamental chemistry or equivalent
mpermissible Combina	ductory level & 24 credits advanced level courses)
36 credits (12 credits intro	ductory level & 24 credits advanced level courses) tion:
36 credits (12 credits intro I <b>mpermissible Combina</b> Major in Chemistry	ductory level & 24 credits advanced level courses) tion: credits)
36 credits (12 credits intro mpermissible Combina Major in Chemistry Required courses (36	oductory level & 24 credits advanced level courses) tion: credits) purses (12 credits)
36 credits (12 credits intro mpermissible Combina Major in Chemistry Required courses (36 1. Introductory level co 12 credits of the followin CHEM1002 Chemistry: CHEM1003 Chemistry: CHEM1009 Basic chem	aductory level & 24 credits advanced level courses) tion: credits) purses (12 credits) g courses: principles and concepts (note 1) 6 the molecular world 6
36 credits (12 credits intro mpermissible Combina Major in Chemistry Required courses (36 1. Introductory level co 12 credits of the followin CHEM1002 Chemistry: CHEM1003 Chemistry: CHEM1009 Basic chem	aductory level & 24 credits advanced level courses) tion: credits) purses (12 credits) g courses: principles and concepts (note 1) 6 the molecular world 6 istry (note 1) 6 als of organic chemistry 6

1 CHEM1002 and CHEM1009 are mutually exclusive

### Remarks:

Vinor Title	Minor in Chemistry
Offered to students admitted to Year 1 in	2011-2012
concepts of chemistry. T	aimed to provide students who are interested in chemistry with an introduction to the fundament he minor curriculum is designed to provide students from different science majors with a high degree ses to enhance their knowledge and interest in chemistry.
	y the basic concepts of chemistry; and laboratory-based learning in the curriculum)
<ul> <li>to apply chemistry con</li> <li>by means of coursework</li> </ul>	cepts in other subjects; and laboratory-based learning in the curriculum)
	ncepts to complement their major of study. and laboratory-based learning in the curriculum)
<b>Minimum Entry Require</b> AL Chemistry or a pass ir	ment: CHEM0008 Fundamental chemistry or equivalent
AL Chemistry or a pass in Minimum Credit Require	CHEM0008 Fundamental chemistry or equivalent
AL Chemistry or a pass in Minimum Credit Requir 36 credits (12 credits intro	a CHEM0008 Fundamental chemistry or equivalent ement: aductory level & 24 credits advanced level courses)
AL Chemistry or a pass in Minimum Credit Require	a CHEM0008 Fundamental chemistry or equivalent ement: aductory level & 24 credits advanced level courses)
AL Chemistry or a pass in Minimum Credit Requir 36 credits (12 credits intro mpermissible Combina	n CHEM0008 Fundamental chemistry or equivalent ement: oductory level & 24 credits advanced level courses) tion:
AL Chemistry or a pass in Minimum Credit Requir 36 credits (12 credits intro mpermissible Combina Major in Chemistry	a CHEM0008 Fundamental chemistry or equivalent ement: aductory level & 24 credits advanced level courses) tion: credits)
AL Chemistry or a pass in Minimum Credit Require 36 credits (12 credits intro- mpermissible Combine Major in Chemistry Required courses (36	a CHEM0008 Fundamental chemistry or equivalent ement: oductory level & 24 credits advanced level courses) tion: credits) purses (12 credits)
AL Chemistry or a pass in Minimum Credit Require 36 credits (12 credits intro- mpermissible Combina Major in Chemistry Required courses (36 1. Introductory level c 12 credits of the followin CHEM1002 Chemistry: CHEM1003 Chemistry: CHEM1009 Basic chem	a CHEM0008 Fundamental chemistry or equivalent ament: boductory level & 24 credits advanced level courses) tion: credits) purses (12 credits) ng courses: principles and concepts (note 1) 6 the molecular world 6 istry (note 1) 6
AL Chemistry or a pass in Minimum Credit Require 36 credits (12 credits intro- mpermissible Combinate Major in Chemistry Required courses (36 1. Introductory level c 12 credits of the followin CHEM1002 Chemistry: CHEM1003 Chemistry: CHEM1009 Basic chem	a CHEM0008 Fundamental chemistry or equivalent poductory level & 24 credits advanced level courses) tion: credits) purses (12 credits) ag courses: principles and concepts (note 1) 6 the molecular world 6 istry (note 1) 6 als of organic chemistry 6
AL Chemistry or a pass in Minimum Credit Require 36 credits (12 credits intro- mpermissible Combina Major in Chemistry Required courses (36 1. Introductory level c 12 credits of the followin CHEM1002 Chemistry: CHEM1003 Chemistry: CHEM1009 Basic chem CHEM1401 Fundament 2. Advanced level cour	a CHEM0008 Fundamental chemistry or equivalent poductory level & 24 credits advanced level courses) tion: credits) purses (12 credits) ag courses: principles and concepts (note 1) 6 the molecular world 6 istry (note 1) 6 als of organic chemistry 6

1 CHEM1002 and CHEM1009 are mutually exclusive

### Remarks:

2010-2011 ed to provide students who are interested in chemistry with an introduction to the fundament ninor curriculum is designed to provide students from different science majors with a high degree to enhance their knowledge and interest in chemistry.
ninor curriculum is designed to provide students from different science majors with a high degree
e basic concepts of chemistry; d laboratory-based learning in the curriculum)
is in other subjects; I laboratory-based learning in the curriculum)
pts to complement their major of study. I laboratory-based learning in the curriculum)
nt: IEM0008 Fundamental chemistry or equivalent
ent: ctory level & 24 credits advanced level courses)
1:
dits)
ses (12 credits)
ourses:
ciples and concepts (note 1) 6 molecular world 6 y (note 1) 6 of organic chemistry 6
s (24 credits)
level Chemistry courses (CHEM2XXX or CHEM3XXX level), subject to prerequisite

# Remarks:

Minor Title	Minor in Chemistry
Offered to students admitted to Year 1 in	2009-2010
concepts of chemistry. Th	nimed to provide students who are interested in chemistry with an introduction to the fundament e minor curriculum is designed to provide students from different science majors with a high degree ses to enhance their knowledge and interest in chemistry.
	v the basic concepts of chemistry; and laboratory-based learning in the curriculum)
b. to apply chemistry conc (by means of coursework a	epts in other subjects; and laboratory-based learning in the curriculum)
	cepts to complement their major of study. and laboratory-based learning in the curriculum)
(by means of coursework a	and laboratory-based learning in the curriculum)
Minimum Entry Requirer	
Minimum Entry Requirer AL Chemistry or a pass in Minimum Credit Require	nent: CHEM0008 Fundamental chemistry or equivalent ment:
Minimum Entry Requirer AL Chemistry or a pass in Minimum Credit Require	nent: CHEM0008 Fundamental chemistry or equivalent ment: ductory level & 24 credits advanced level courses)
Minimum Entry Requirer AL Chemistry or a pass in Minimum Credit Require 36 credits (12 credits intro Impermissible Combinat	nent: CHEM0008 Fundamental chemistry or equivalent ment: ductory level & 24 credits advanced level courses) ion:
Minimum Entry Requirer AL Chemistry or a pass in Minimum Credit Require 36 credits (12 credits intro Impermissible Combinat Major in Chemistry	nent: CHEM0008 Fundamental chemistry or equivalent ment: ductory level & 24 credits advanced level courses) ion:
Minimum Entry Requirer AL Chemistry or a pass in Minimum Credit Require 36 credits (12 credits intro Impermissible Combinat Major in Chemistry Required courses (36 c	nent: CHEM0008 Fundamental chemistry or equivalent ment: ductory level & 24 credits advanced level courses) ion: rredits) urses (12 credits)
Minimum Entry Requirer AL Chemistry or a pass in Minimum Credit Require 36 credits (12 credits intro Impermissible Combinat Major in Chemistry Required courses (36 c 1. Introductory level co 12 credits of the following CHEM1002 Chemistry: p CHEM1003 Chemistry: t CHEM1009 Basic chemi	nent: CHEM0008 Fundamental chemistry or equivalent ment: ductory level & 24 credits advanced level courses) ion: rredits) urses (12 credits) g courses: principles and concepts (note 1) 6 he molecular world 6
Minimum Entry Requirer AL Chemistry or a pass in Minimum Credit Require 36 credits (12 credits intro Impermissible Combinat Major in Chemistry Required courses (36 c 1. Introductory level co 12 credits of the following CHEM1002 Chemistry: p CHEM1003 Chemistry: t CHEM1009 Basic chemi	nent: CHEM0008 Fundamental chemistry or equivalent ment: ductory level & 24 credits advanced level courses) ion: rredits) urses (12 credits) g courses: principles and concepts (note 1) 6 he molecular world 6 stry (note 1) 6 ils of organic chemistry 6

# Notes:

1 CHEM1002 and CHEM1009 are mutually exclusive

#### Remarks:

Minor Title	Minor in Earth Sciences
Offered to students	2012-2013

Objectives:

The Earth Sciences minor is aimed to provide interested students 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 interest in Earth Sciences or to complement their major of study.

# Learning Outcomes:

a. to understand and describe the methods used by Earth scientists to study the Earth systems (by means of coursework, tutorial classes and field-based learning in the curriculum)

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

c. to discuss and comment critically issues related to the Earth Sciences in media reports (by means of coursework, group projects and presentation opportunities in the curriculum)

# Minimum Entry Requirement: NIL

# Minimum Credit Requirement:

36 credits (12 credits introductory level & 24 credits advanced level courses)

# Impermissible Combination:

Major in Earth Sciences

# Required courses (36 credits)

# 1. Introductory level courses (12 credits)

Any two of the following three courses:

EASC0105 Earth through time 6 EASC0116 Introduction to physical geology 6 EASC0118 Blue planet 6

# 2. Advanced level courses (24 credits)

Any 24 credits of advanced level Earth Sciences courses (EASC2XXX or EASC3XXX level), subject to prerequisite requirements.

#### Remarks:

Minor Title	Minor in Earth Sciences
Offered to students	2011-2012

**Objectives:** The Earth Sciences minor is aimed to provide interested students 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 interest in Earth Sciences or to complement their major of study.

# Learning Outcomes:

a. to understand and describe the methods used by Earth scientists to study the Earth systems (by means of coursework, tutorial classes and field-based learning in the curriculum)

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

c. to discuss and comment critically issues related to the Earth Sciences in media reports (by means of coursework, group projects and presentation opportunities in the curriculum)

#### Minimum Entry Requirement: NIL

# Minimum Credit Requirement:

36 credits (12 credits introductory level & 24 credits advanced level courses)

# Impermissible Combination:

Major in Earth Sciences

# Required courses (36 credits)

# 1. Introductory level courses (12 credits)

Any two of the following three courses:

EASC0105 Earth through time 6 EASC0116 Introduction to physical geology 6 EASC0118 Blue planet 6

# 2. Advanced level courses (24 credits)

Any 24 credits of advanced level Earth Sciences courses (EASC2XXX or EASC3XXX level), subject to prerequisite requirements.

#### Remarks:

Minor Title	Minor in Earth Sciences
Offered to students admitted to Year 1 in	2010-2011
history of the Earth. The minor	ned to provide interested students an introduction to the fundamental structure, process and curriculum is designed particularly to provide students from different majors the flexibility to nterest in Earth Sciences or to complement their major of study.

#### Learning Outcomes:

a. to understand and describe the methods used by Earth scientists to study the Earth systems (by means of coursework, tutorial classes and field-based learning in the curriculum)

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

c. to discuss and comment critically issues related to the Earth Sciences in media reports (by means of coursework, group projects and presentation opportunities in the curriculum)

#### Minimum Entry Requirement: NIL

# Minimum Credit Requirement:

36 credits (12 credits introductory level & 24 credits advanced level courses)

# Impermissible Combination:

Major in Earth Sciences

# Required courses (36 credits)

# 1. Introductory level courses (12 credits)

Any two of the following three courses:

EASC0105 Earth through time 6 EASC0116 Introduction to physical geology 6 EASC0118 Blue planet 6

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

Any 24 credits of advanced level Earth Sciences courses (EASC2XXX or EASC3XXX level), subject to prerequisite requirements.

#### Remarks:

	Minor in Earth Sciences
Offered to students admitted to Year 1 in	2009-2010
history of the Earth. The m	s aimed to provide interested students an introduction to the fundamental structure, process ar inor curriculum is designed particularly to provide students from different majors the flexibility reir interest in Earth Sciences or to complement their major of study.
	e the methods used by Earth scientists to study the Earth systems torial classes and field-based learning in the curriculum)
	e the basic nomenclature used in Earth Sciences torial classes and field-based learning in the curriculum)
	critically issues related to the Earth Sciences in media reports oup projects and presentation opportunities in the curriculum)
Minimum Entry Requireme	nt.
NIL	
NIL Minimum Credit Requirem	
NIL Minimum Credit Requirem	ent: ctory level & 24 credits advanced level courses)
NIL Minimum Credit Requirem 36 credits (12 credits introdu Impermissible Combinatio	ent: ctory level & 24 credits advanced level courses) n:
NIL <b>Minimum Credit Requirem</b> 36 credits (12 credits introdu <b>Impermissible Combinatio</b> Major in Earth Sciences	ent: ctory level & 24 credits advanced level courses) n: rdits)
NIL Minimum Credit Requirem 36 credits (12 credits introdu Impermissible Combinatio Major in Earth Sciences Required courses (36 cre	ent: ctory level & 24 credits advanced level courses) n: rdits) rses (12 credits)
NIL Minimum Credit Requirem 36 credits (12 credits introdu Impermissible Combinatio Major in Earth Sciences Required courses (36 cre 1. Introductory level cour	ent: ctory level & 24 credits advanced level courses) n: dits) rees (12 credits) ree courses: ime 6
NIL Minimum Credit Requirem 36 credits (12 credits introdu Impermissible Combinatio Major in Earth Sciences Required courses (36 cre 1. Introductory level cour Any two of the following th EASC0105 Earth through th EASC0116 Introduction to	ent: ctory level & 24 credits advanced level courses) n: dits) rese (12 credits) ree courses: ime 6 physical geology 6

Minor Title	Minor in Ecology & Biodiversity
Offered to students	2012-2013

# Objectives:

This minor 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 of this minor will then be able to build upon this basic knowledge 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:

a. 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)

b. 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)

c. 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)

# Minimum Entry Requirement:

#### NIL

# Minimum Credit Requirement:

36 credits (12 credits introductory level & 24 credits advanced level courses)

# Impermissible Combination:

Major in Ecology & Biodiversity

# **Required courses (36 credits)**

# 1. Introductory level courses (12 credits)

At least 12 credits of the following courses:

BIOL0604 Evolutionary diversity 6 BIOL0625 Ecology and evolution 6 BIOL1608 Biostatistics 6

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

Plus at least 24 credits of the following courses:

BIOL2606 Environmental microbiology 6 BIOL2607 Fish biology 6 BIOL2610 Marine biology 6 BIOL2611 Systematics & phylogenetics 6 BIOL2612 Conservation ecology 6 BIOL2615 Freshwater ecology 6 BIOL2615 Freshwater ecology 6 BIOL2617 Experimental intertidal ecology 6 BIOL2619 Terrestrial ecology 6 BIOL2621 Plant structure and evolution 6 BIOL2622 The biology of marine mammals 6 BIOL2625 Animal behaviour 6 BIOL3622 Ecological impact assessment 6 BIOL3626 Conservation in practice 6

#### Remarks:

Minor Title	Minor in Ecology & Biodiversity
Offered to students	2011-2012

#### **Objectives:**

This minor 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 of this minor will then be able to build upon this basic knowledge 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:

a. 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)

b. 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)

c. 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)

# Minimum Entry Requirement:

NIL

#### Minimum Credit Requirement:

36 credits (12 credits introductory level & 24 credits advanced level courses)

# Impermissible Combination:

Major in Ecology & Biodiversity

#### **Required courses (36 credits)**

### 1. Introductory level courses (12 credits)

At least 12 credits of the following courses:

BIOL0600 Ecology of Hong Kong 6 BIOL0604 Evolutionary diversity 6 BIOL0625 Ecology and evolution 6

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

Plus at least 24 credits of the following courses:

BIOL2606 Environmental microbiology 6 BIOL2607 Fish biology 6 BIOL2608 Biometrics (note 1) 6 BIOL2610 Biological oceanography OR Marine biology 6 BIOL2611 Systematics & phylogenetics 6 BIOL2612 Conservation ecology 6 BIOL2615 Freshwater ecology 6 BIOL2615 Freshwater ecology 6 BIOL2619 Terrestrial ecology 6 BIOL2619 Terrestrial ecology 6 BIOL2621 Plant structure and evolution 6 BIOL2622 The biology of marine mammals 6 BIOL2622 Ecological impact assessment 6

#### Notes:

1. Not available in 2012-2013 or thereafter.

#### Remarks:

Minor Title	Minor in Ecology & Biodiversity
Offered to students	2010-2011

#### Objectives:

This minor 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 of this minor will then be able to build upon this basic knowledge 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:

a. 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)

b. 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)

c. 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)

# Minimum Entry Requirement:

#### NIL

# Minimum Credit Requirement:

36 credits (12 credits introductory level & 24 credits advanced level courses)

# Impermissible Combination:

Major in Ecology & Biodiversity

# **Required courses (36 credits)**

# 1. Introductory level courses (12 credits)

At least 12 credits of the following courses:

BIOL0600 Ecology of Hong Kong 6 BIOL0604 Evolutionary diversity 6 BIOL0625 Ecology and evolution 6

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

Plus at least 24 credits of the following courses:

BIOL2606 Environmental microbiology 6 BIOL2607 Fish biology 6 BIOL2608 Biometrics (note 1) 6 BIOL2610 Biological oceanography OR Marine biology 6 BIOL2611 Systematics & phylogenetics 6 BIOL2612 Conservation ecology 6 BIOL2615 Freshwater ecology 6 BIOL2615 Freshwater ecology 6 BIOL2617 Coastal ecology 0R Experimental intertidal ecology 6 BIOL2619 Terrestrial ecology 6 BIOL2621 Plant structure and evolution 6 BIOL2622 The biology of marine mammals 6 BIOL3622 Ecological impact assessment 6

# Notes:

1. Not available in 2012-2013 or thereafter.

#### Remarks:

Minor Title	Minor in Ecology & Biodiversity
Offered to students	2009-2010

Offered to students admitted to Year 1 in

Year 1 in

# Objectives:

This minor 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 of this minor will then be able to build upon this basic knowledge 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:

a. 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)

b. 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)

c. 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)

# Minimum Entry Requirement:

NIL

# Minimum Credit Requirement:

36 credits (12 credits introductory level & 24 credits advanced level courses)

# Impermissible Combination:

Major in Ecology & Biodiversity

# **Required courses (36 credits)**

# 1. Introductory level courses (12 credits)

At least 12 credits of the following courses:

BIOL0601 Ecology of Hong Kong (note 1) (3) OR BIOL0600 Ecology of Hong Kong 6 BIOL0604 Evolutionary diversity 6 BIOL0605 Ecology field course (note 1) 3 BIOL0625 Ecology and evolution 6

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

Plus at least 24 credits of the following courses:

BIOL2606 Environmental microbiology 6 BIOL2607 Fish biology 6 BIOL2608 Biometrics (note 2) 6 BIOL2610 Biological oceanography OR Marine biology 6 BIOL2611 Systematics & phylogenetics 6 BIOL2612 Conservation biology OR Conservation ecology 6 BIOL2615 Freshwater ecology 6 BIOL2616 Plant structure and evolution (note 1) (3) OR BIOL2621 Plant structure and evolution 6 BIOL2617 Coastal ecology OR Experimental intertidal ecology 6 BIOL2619 Terrestrial ecology 6

#### Notes:

1. Not available in 2010-2011 or thereafter.

2. Not available in 2012-2013 or thereafter.

#### Remarks:

Minor Title	Minor in Food & Nutritional Science

Offered to students admitted to Year 1 in 2012-2013

### Objectives:

The Food and Nutritional Science minor 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:

a. Demonstrate broad knowledge in the field of food and nutritional science. (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)

b. 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)

c. 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)

d. 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)

# Minimum Entry Requirement:

AL Biology or equivalent or a pass in BIOL0126 Fundamentals of biology and AL / AS Chemistry or equivalent or a pass in CHEM0008 Fundamental chemistry

# Minimum Credit Requirement:

36 credits (12 credits introductory level & 24 credits advanced level courses)

# Impermissible Combination:

Major in Food & Nutritional Science

# Required courses (36 credits)

# 1. Introductory level courses (12 credits)

BIOL1514 Nutrition and metabolism 6 BIOL1528 Food chemistry 6

# 2. Advanced level courses (24 credits)

At least 24 credits of the following courses:

BIOL2218 Human physiology 6 BIOL2302 Fermentation technology 6 BIOL2503 Grain production & utilization 6 BIOL2507 Meat and dairy science 6 BIOL2515 Food microbiology 6 BIOL2530 Molecular biology and nutrigenomics 6 BIOL2532 Diet and disease 6 BIOL2533 Nutrition and life cycle 6 BIOL2534 Nutrition and public health 6 BIOL2535 Food processing and engineering laboratory course 6 BIOL2536 Food and nutrients analysis laboratory course 6 **BIOL2538 Nutraceuticals and functional foods** BIOL2540 Food and nutritional toxicology 6 BIOL3527 Food safety and quality management 6 BIOL3538 Food product development 6 BIOL3540 Diet, brain function and behavious 6

#### Remarks:

Minor Title	Minor in Food & Nutritional Science

Offered to students admitted to Year 1 in

lents 2011-2012

### **Objectives:**

The Food and Nutritional Science minor 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:

a. Demonstrate broad knowledge in the field of food and nutritional science. (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)

b. 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)

c. 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)

d. 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)

# Minimum Entry Requirement:

AL Biology or equivalent or a pass in BIOL0126 Fundamentals of biology and AL / AS Chemistry or equivalent or a pass in CHEM0008 Fundamental chemistry

# Minimum Credit Requirement:

36 credits (12 credits introductory level & 24 credits advanced level courses)

# Impermissible Combination:

Major in Food & Nutritional Science

# **Required courses (36 credits)**

# 1. Introductory level courses (12 credits)

BIOL1514 Nutrition and metabolism 6 BIOL1528 Food chemistry 6

# 2. Advanced level courses (24 credits)

At least 24 credits of the following courses:

BIOL2218 Human physiology 6 BIOL2302 Fermentation technology 6 BIOL2503 Grain production & utilization 6 BIOL2507 Meat and dairy science 6 BIOL2515 Food microbiology 6 BIOL2530 Molecular biology and nutrigenomics 6 BIOL2531 Principles of Chinese medicinal diet 6 BIOL2532 Diet and disease 6 BIOL2533 Nutrition and life cycle 6 BIOL2534 Nutrition and public health 6 BIOL2535 Food processing and engineering laboratory course 6 BIOL2536 Food and nutrients analysis laboratory course 6 BIOL2538 Nutraceuticals and functional foods BIOL2540 Basics of toxicology OR Food and nutritional toxicology 6 BIOL3527 Food safety and quality management 6 BIOL3538 Food product development 6 BIOL3540 Diet, brain function and behavious 6

#### Remarks:

sociological employment

Minor Title	Minor in Food & Nutritional Science
Offered to students admitted to Year 1 in	2010-2011
	e minor aims to provide a comprehensive education in food, nutrition and related g graduates to develop their interest in food and nutrition and have a wide range of e
Learning Outcomes: a. Demonstrate broad knowledge in the field of food and nutritional science. (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)	

b. 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)

c. 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)

d. 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)

#### Minimum Entry Requirement:

AL Biology or equivalent or a pass in BIOL0126 Fundamentals of biology and AL / AS Chemistry or equivalent or a pass in CHEM0008 Fundamental chemistry

#### Minimum Credit Requirement:

36 credits (12 credits introductory level & 24 credits advanced level courses)

# Impermissible Combination:

Major in Food & Nutritional Science

#### **Required courses (36 credits)**

### 1. Introductory level courses (12 credits)

BIOL1514 Nutrition and metabolism 6 BIOL1528 Food chemistry 6

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

At least 24 credits of the following courses:

BIOL2218 Human physiology 6 BIOL2302 Fermentation technology 6 BIOL2503 Grain production & utilization 6 BIOL2507 Meat and dairy science 6 BIOL2515 Food microbiology 6 BIOL2529 Food and nutritional toxicology OR BIOL2540 Basics of Toxicology OR Food and nutritional toxicology 6 BIOL2530 Molecular biology and nutrigenomics 6 BIOL2531 Principles of Chinese medicinal diet 6 BIOL2532 Diet and disease 6 BIOL2533 Nutrition and life cycle 6 BIOL2534 Nutrition and public health 6 BIOL2535 Food processing and engineering laboratory course 6 BIOL2536 Food and nutrients analysis laboratory course 6 **BIOL2538 Nutraceuticals and functional foods** BIOL3527 Food safety and quality management 6 BIOL3538 Food product development 6 BIOL3540 Diet, brain function and behavious 6

#### Remarks:

Minor	Title
1011101	1100

Minor in Food & Nutritional Science

Offered to students admitted to Year 1 in

2009-2010

#### **Objectives:**

The Food and Nutritional Science minor 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:

a. Demonstrate broad knowledge in the field of food and nutritional science. (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)

b. 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)

c. 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)

d. 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)

#### Minimum Entry Requirement:

AL Biology or equivalent or a pass in BIOL0126 Fundamentals of biology and AL / AS Chemistry or equivalent or a pass in CHEM0008 Fundamental chemistry

#### Minimum Credit Requirement:

36 credits (12 credits introductory level & 24 credits advanced level courses)

#### Impermissible Combination:

Major in Food & Nutritional Science

#### **Required courses (36 credits)**

#### 1. Introductory level courses (12 credits)

BIOL1514 Nutrition and metabolism 6 BIOL1528 Food chemistry 6

The following course is strongly recommended as an elective: BIOL0002 Introduction to food and nutritional science (note 1) 3

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

At least 24 credits of the following courses:

BIOL2218 Human physiology 6 BIOL2302 Fermentation technology 6 BIOL2503 Grain production & utilization 6 BIOL2507 Meat and dairy science 6 BIOL2515 Food microbiology 6 BIOL2529 Food and nutritional toxicology OR BIOL2540 Basics of Toxicology OR Food and nutritional toxicology 6 BIOL2530 Molecular biology and nutrigenomics 6 BIOL2531 Principles of Chinese medicinal diet 6 BIOL2532 Diet and disease 6 BIOL2533 Nutrition and life cycle 6 BIOL2534 Nutrition and public health 6 BIOL2535 Food processing and engineering laboratory course 6 BIOL2536 Food and nutrients analysis laboratory course 6 BIOL2538 Nutraceuticals and functional foods BIOL3527 Food safety and quality management 6 BIOL3538 Food product development 6 BIOL3540 Diet, brain function and behavious 6

# Notes:

1 Not available in 2010-2011 or thereafter.

#### Remarks:

Minor Title	Minor in General Science
Offered to students	2012-2013

Objectives:

admitted to Year 1 in

Science is an indispensable component of this modern world, with a significant impact to our daily lives. Be it the interaction between animals and their natural environment, the food in our daily diet, the synthesis of new materials (nanomaterials, polymeric and semiconducting materials), the mystery of the human gene, or the application of mathematics to solve problems. This Minor is suitable for non-Science students who are interested in exploring science and learning how scientists study the real world. The scientific knowledge, quantitative reasoning, logical and analytical thinking and sense of numeracy will be useful in various fields of finance, business, social sciences, arts and education. Students have the flexibility to gather courses in any area of interest.

# Learning Outcomes:

NIL

# Minimum Entry Requirement: NIL

Minimum Credit Requirement:

36 credits (12 credits introductory level & 24 credits advanced level courses)

# Impermissible Combination:

Nil (This Minor is only offered to non-Faculty of Science students.)

#### Required courses (36 credits)

# 1. Introductory level courses (12 credits)

At least 12 credits of any introductory level Science courses (level 0 & 1), subject to prerequisite requirements.

# 2. Advanced level courses (24 credits)

At least 24 credits of any advanced level Science courses (level 2 & 3), subject to prerequisite requirements.

# Remarks:

Minor Title	Minor in General Science
Offered to students	2011-2012

#### **Objectives:**

Science is an indispensable component of this modern world, with a significant impact to our daily lives. Be it the interaction between animals and their natural environment, the food in our daily diet, the synthesis of new materials (nanomaterials, polymeric and semiconducting materials), the mystery of the human gene, or the application of mathematics to solve problems. This Minor is suitable for non-Science students who are interested in exploring science and learning how scientists study the real world. The scientific knowledge, quantitative reasoning, logical and analytical thinking and sense of numeracy will be useful in various fields of finance, business, social sciences, arts and education. Students have the flexibility to gather courses in any area of interest.

# Learning Outcomes:

NIL

# Minimum Entry Requirement: NIL

Minimum Credit Requirement:

36 credits (12 credits introductory level & 24 credits advanced level courses)

# Impermissible Combination:

Nil (This Minor is only offered to non-Faculty of Science students.)

# Required courses (36 credits)

# 1. Introductory level courses (12 credits)

At least 12 credits of any introductory level Science courses (level 0 & 1), subject to prerequisite requirements.

# 2. Advanced level courses (24 credits)

At least 24 credits of any advanced level Science courses (level 2 & 3), subject to prerequisite requirements.

# Remarks:

Minor Title	Minor in General Science
Offered to students	2010-2011

Objectives:

Science is an indispensable component of this modern world, with a significant impact to our daily lives. Be it the interaction between animals and their natural environment, the food in our daily diet, the synthesis of new materials (nanomaterials, polymeric and semiconducting materials), the mystery of the human gene, or the application of mathematics to solve problems. This Minor is suitable for non-Science students who are interested in exploring science and learning how scientists study the real world. The scientific knowledge, quantitative reasoning, logical and analytical thinking and sense of numeracy will be useful in various fields of finance, business, social sciences, arts and education. Students have the flexibility to gather courses in any area of interest.

# Learning Outcomes:

NIL

# Minimum Entry Requirement: NIL

Minimum Credit Requirement:

36 credits (12 credits introductory level & 24 credits advanced level courses)

# Impermissible Combination:

Nil (This Minor is only offered to non-Faculty of Science students.)

# Required courses (36 credits)

# 1. Introductory level courses (12 credits)

At least 12 credits of any introductory level Science courses (level 0 & 1), subject to prerequisite requirements.

# 2. Advanced level courses (24 credits)

At least 24 credits of any advanced level Science courses (level 2 & 3), subject to prerequisite requirements.

# Remarks:

Minor Title	Minor in General Science
Offered to students	2009-2010

### Objectives:

Science is an indispensable component of this modern world, with a significant impact to our daily lives. Be it the interaction between animals and their natural environment, the food in our daily diet, the synthesis of new materials (nanomaterials, polymeric and semiconducting materials), the mystery of the human gene, or the application of mathematics to solve problems. This Minor is suitable for non-Science students who are interested in exploring science and learning how scientists study the real world. The scientific knowledge, quantitative reasoning, logical and analytical thinking and sense of numeracy will be useful in various fields of finance, business, social sciences, arts and education. Students have the flexibility to gather courses in any area of interest.

# Learning Outcomes:

NIL

# Minimum Entry Requirement: NIL

Minimum Credit Requirement:

36 credits (12 credits introductory level & 24 credits advanced level courses)

# Impermissible Combination:

Nil (This Minor is only offered to non-Faculty of Science students.)

# Required courses (36 credits)

# 1. Introductory level courses (12 credits)

At least 12 credits of any introductory level Science courses (level 0 & 1), subject to prerequisite requirements.

# 2. Advanced level courses (24 credits)

At least 24 credits of any advanced level Science courses (level 2 & 3), subject to prerequisite requirements.

# Remarks:

Minor Title	Minor in Global Climate Change
Offered to students admitted to Year 1 in	2012-2013

#### **Objectives:**

Global Climate Change is one of the most pressing issues affecting all mankind in today's world. The Global Climate Change minor is aimed to provide interested students an introduction to the phenomenon of global climate change, it's impact on Earth's inhabitants, and various anthropogenic and natural factors, which cause the change. The curriculum of this minor is designed particularly to provide students from different majors the flexibility to select courses to enhance their interest in Global Climate Change or to complement their major of study.

#### Learning Outcomes:

a. to recognize, explain and connect the basic principles, concepts, theories, pertaining to the global climate change debate using appropriate scientific language

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

b. to describe and interpret the evolution of Earth's climate system (by means of coursework, tutorial and laboratory-based learning in the curriculum)

c. to communicate, analyse and explain the past and possible future effects of global climate change on Earth's inhabitants (by means of coursework, tutorial and laboratory-based learning in the curriculum)

d. to describe and compare anthropogenic and natural factors responsible for climate change at different timeframes. (by means of coursework, tutorial and laboratory-based learning in the curriculum)

# Minimum Entry Requirement:

NIL

#### Minimum Credit Requirement:

36 credits (12 credits introductory level & 24 credits advanced level courses)

# Impermissible Combination:

NIL (note 1)

#### Required courses (36 credits)

#### 1. Introductory level courses (12 credits)

EASC0122 Introduction to climate science 6

Plus at least 6 credits from the following courses:

BIOL0625 Ecology and evolution 6 EASC0105 Earth through time 6 EASC0118 Blue planet 6 PHYS0629 Weather and climate 6

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

EASC2127 Global change: anthropogenic impact 6 EASC2131 A cool world: ice ages and climate change 6

Plus at least 12 credits from the following courses:

BIOL2610 Biological oceanography 6 BIOL2612 Conservation ecology 6 CHEM2102 Environmental chemistry 6 EASC2005 Meteorology 6 EASC2112 Earth systems 6 ENVS2013 Environmental oceanography 6

#### Notes:

1 For students having major / minor combination of Earth Sciences / Global Climate Change, any single introductory or advanced level Earth Sciences course can be used to satisfy a major or minor requirement only once.

#### Remarks:

Minor Title	Minor in Global Climate Change
Offered to students admitted to Year 1 in	2011-2012

#### Objectives:

Global Climate Change is one of the most pressing issues affecting all mankind in today's world. The Global Climate Change minor is aimed to provide interested students an introduction to the phenomenon of global climate change, it's impact on Earth's inhabitants, and various anthropogenic and natural factors, which cause the change. The curriculum of this minor is designed particularly to provide students from different majors the flexibility to select courses to enhance their interest in Global Climate Change or to complement their major of study.

#### Learning Outcomes:

a. to recognize, explain and connect the basic principles, concepts, theories, pertaining to the global climate change debate using appropriate scientific language

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

b. to describe and interpret the evolution of Earth's climate system (by means of coursework, tutorial and laboratory-based learning in the curriculum)

c. to communicate, analyse and explain the past and possible future effects of global climate change on Earth's inhabitants (by means of coursework, tutorial and laboratory-based learning in the curriculum)

d. to describe and compare anthropogenic and natural factors responsible for climate change at different timeframes. (by means of coursework, tutorial and laboratory-based learning in the curriculum)

#### Minimum Entry Requirement:

NIL

#### Minimum Credit Requirement:

36 credits (12 credits introductory level & 24 credits advanced level courses)

#### Impermissible Combination:

NIL (note 1)

#### Required courses (36 credits)

#### 1. Introductory level courses (12 credits)

EASC0122 Introduction to climate science 6

Plus at least 6 credits from the following courses:

BIOL0625 Ecology and evolution 6 EASC0105 Earth through time 6 EASC0118 Blue planet 6 PHYS0629 Weather and climate 6

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

EASC2127 Global change: anthropogenic impact 6 EASC2131 A cool world: ice ages and climate change 6

Plus at least 12 credits from the following courses:

BIOL2610 Biological oceanography OR Marine biology 6 BIOL2612 Conservation ecology 6 CHEM2102 Environmental chemistry 6 EASC2005 Meteorology 6 EASC2112 Earth systems 6 ENVS2013 Environmental oceanography 6

#### Notes:

1 For students having major / minor combination of Earth Sciences / Global Climate Change, any single introductory or advanced level Earth Sciences course can be used to satisfy a major or minor requirement only once.

#### Remarks:

Minor Title	Minor in Global Climate Change
Offered to students admitted to Year 1 in	2010-2011
minor is aimed to provide intereste	the most pressing issues affecting all mar ed students an introduction to the phenome

Global Climate Change is one of the most pressing issues affecting all mankind in today's world. The Global Climate Change minor is aimed to provide interested students an introduction to the phenomenon of global climate change, it's impact on Earth's inhabitants, and various anthropogenic and natural factors, which cause the change. The curriculum of this minor is designed particularly to provide students from different majors the flexibility to select courses to enhance their interest in Global Climate Change or to complement their major of study.

#### Learning Outcomes:

a. to recognize, explain and connect the basic principles, concepts, theories, pertaining to the global climate change debate using appropriate scientific language

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d. to describe and compare anthropogenic and natural factors responsible for climate change at different timeframes. (by means of coursework, tutorial and laboratory-based learning in the curriculum)

#### Minimum Entry Requirement:

NIL

#### Minimum Credit Requirement:

36 credits (12 credits introductory level & 24 credits advanced level courses)

#### Impermissible Combination:

NIL (note 1)

#### Required courses (36 credits)

#### 1. Introductory level courses (12 credits)

EASC0122 Introduction to climate science 6

Plus at least 6 credits from the following courses:

BIOL0625 Ecology and evolution 6 EASC0105 Earth through time 6 EASC0118 Blue planet 6 PHYS0629 Weather and climate 6

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

EASC2127 Global change: anthropogenic impact 6 EASC2131 A cool world: ice ages and climate change 6

Plus at least 12 credits from the following courses:

BIOL2610 Biological oceanography OR Marine biology 6 BIOL2612 Conservation ecology 6 CHEM2102 Environmental chemistry 6 EASC2005 Meteorology 6 EASC2112 Earth systems 6 EASC2128 Earth-ocean-atmosphere interactions 6 EASC2129 Physical oceanography 6 EASC2130 Earth observation and remote sensing 6

#### Notes:

1 For students having major / minor combination of Earth Sciences / Global Climate Change, any single introductory or advanced level Earth Sciences course can be used to satisfy a major or minor requirement only once.

#### Remarks:

Minor Title	Minor in Global Climate Change
Offered to students admitted to Year 1 in	2009-2010
<b>Objectives:</b> Global Climate Change is one of	the most pressing issues affecting all r

Global Climate Change is one of the most pressing issues affecting all mankind in today's world. The Global Climate Change minor is aimed to provide interested students an introduction to the phenomenon of global climate change, it's impact on Earth's inhabitants, and various anthropogenic and natural factors, which cause the change. The curriculum of this minor is designed particularly to provide students from different majors the flexibility to select courses to enhance their interest in Global Climate Change or to complement their major of study.

#### Learning Outcomes:

a. to recognize, explain and connect the basic principles, concepts, theories, pertaining to the global climate change debate using appropriate scientific language

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

b. to describe and interpret the evolution of Earth's climate system (by means of coursework, tutorial and laboratory-based learning in the curriculum)

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d. to describe and compare anthropogenic and natural factors responsible for climate change at different timeframes. (by means of coursework, tutorial and laboratory-based learning in the curriculum)

#### Minimum Entry Requirement:

NIL

#### Minimum Credit Requirement:

36 credits (12 credits introductory level & 24 credits advanced level courses)

### Impermissible Combination:

NIL (note 1)

#### Required courses (36 credits)

#### 1. Introductory level courses (12 credits)

EASC0121 Earth's climate past and future 3 EASC0136 Introduction to climatology 3

Plus at least 6 credits from the following courses:

BIOL0605 Ecology field course 3 BIOL0625 Ecology and evolution 6 EASC0105 Earth through time 6 EASC0118 Blue planet 6 EASC0120 Earth, environment and society 6 PHYS0610 Weather today 3

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

EASC2127 Global change: anthropogenic impact 6 EASC2131 A cool world: ice ages and climate change 6

Plus at least 12 credits from the following courses:

BIOL2610 Biological oceanography OR Marine biology 6 BIOL2612 Conservation ecology 6 CHEM2102 Environmental chemistry 6 EASC2005 Meteorology 6 EASC2112 Earth systems 6 EASC2128 Earth-ocean-atmosphere interactions 6 EASC2129 Physical oceanography 6 EASC2130 Earth observation and remote sensing 6

#### Notes:

1 For students having major / minor combination of Earth Sciences / Global Climate Change, any single introductory or advanced level Earth Sciences course can be used to satisfy a major or minor requirement only once.

Remarks:

	Minor in Mathematics
Offered to students Idmitted to Year 1 in	2012-2013
lesigned for students who aims to nurture quantitativ	provides the students with fundamental undergraduate education in the subject. It is specificall to are interested in the subject and those whose majors require sophisticated mathematical skills. re reasoning, logical, analytical and critical thinking, innovative imagination, meticulous care to work ills for problem-solving, and capability to tackle novel situations and ill-defined problems.
	and describe fundamental concepts of mathematics tutorial classes and project-based learning in the curriculum)
	nematical methods and analysis to real life problems tutorial classes and project-based learning in the curriculum)
	ate and discuss scientific issues related to mathematics tutorial classes and presentation opportunities in the curriculum)
Minimum Entry Requirer	nent:
	ematics and AS Mathematics and Statistics; or
<ol> <li>AL Pure Mathematics; c</li> <li>a pass in MATH0201 Ba</li> <li>hose with AS Math &amp; Stat</li> </ol>	asic calculus (for those with HKCEE Math only) or a pass in MATH1804 University mathematics A (for
Minimum Credit Require	
86 credits (12 credits intro	ductory level & 24 credits advanced level courses)
Aajor in Mathematics; Mat	hematics/Physics
Najor in Mathematics; Mat Required courses (36 c	redits)
Aajor in Mathematics; Mat Required courses (36 c 1. Introductory level co	redits) urses (12 credits) (note 2)
Major in Mathematics; Mat Required courses (36 c 1. Introductory level co MATH1111 Linear algeb	redits) urses (12 credits) (note 2) ra 6
Major in Mathematics; Mat Required courses (36 c 1. Introductory level co MATH1111 Linear algeb Plus one of the following	thematics/Physics redits) urses (12 credits) (note 2) ra 6 courses:
Major in Mathematics; Mat Required courses (36 c 1. Introductory level co MATH1111 Linear algeb Plus one of the following MATH1211 Multivariable MATH1805 University m	thematics/Physics redits) urses (12 credits) (note 2) ra 6 courses: calculus 6 athematics B 6
Major in Mathematics; Mat Required courses (36 c 1. Introductory level co MATH1111 Linear algeb Plus one of the following MATH1211 Multivariable MATH1805 University m	thematics/Physics redits) urses (12 credits) (note 2) ra 6 courses: calculus 6
Major in Mathematics; Mat Required courses (36 c 1. Introductory level co MATH1111 Linear algeb Plus one of the following MATH1211 Multivariable MATH1805 University m	thematics/Physics redits) urses (12 credits) (note 2) ra 6 courses: calculus 6 athematics B 6 al methods for actuarial science 6
1. Introductory level co MATH1111 Linear algeb Plus one of the following MATH1211 Multivariable MATH1805 University m MATH1813 Mathematica 2. Advanced level cour	thematics/Physics redits) urses (12 credits) (note 2) ra 6 courses: calculus 6 athematics B 6 il methods for actuarial science 6 ses (24 credits) ed level Mathematics courses (MATH2XXX or MATH3XXX or MATH6XXX level), subject to
Major in Mathematics; Mat Required courses (36 c 1. Introductory level co MATH1111 Linear algeb Plus one of the following MATH1211 Multivariable MATH1815 University m MATH1813 Mathematica 2. Advanced level cour Any 24 credits of advance	thematics/Physics redits) urses (12 credits) (note 2) ra 6 courses: calculus 6 athematics B 6 il methods for actuarial science 6 ses (24 credits) ed level Mathematics courses (MATH2XXX or MATH3XXX or MATH6XXX level), subject to
Major in Mathematics; Mathematics; Mathematics; Mathematics; Mathematics; Mathematics; Mathematics (36 c 1. Introductory level co MATH1111 Linear algeb Plus one of the following MATH1211 Multivariable MATH1211 Multivariable MATH1813 Mathematica 2. Advanced level cour Any 24 credits of advance prerequisite requirement Notes: Students with different courses.	thematics/Physics redits) urses (12 credits) (note 2) ra 6 courses: calculus 6 athematics B 6 il methods for actuarial science 6 ses (24 credits) ed level Mathematics courses (MATH2XXX or MATH3XXX or MATH6XXX level), subject to

	Minor in Mathematics
Offered to students Idmitted to Year 1 in	2011-2012
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	and describe fundamental concepts of mathematics tutorial classes and project-based learning in the curriculum)
	ematical methods and analysis to real life problems tutorial classes and project-based learning in the curriculum)
	ate and discuss scientific issues related to mathematics tutorial classes and presentation opportunities in the curriculum)
Minimum Entry Requiren	nent:
	ematics and AS Mathematics and Statistics; or
AL Pure Mathematics; of a pass in MATH0201 Bathose with AS Math & State	asic calculus (for those with HKCEE Math only) or a pass in MATH1804 University mathematics A (for
Minimum Credit Require	ment:
	ductory level & 24 credits advanced level courses)
mpermissible Combinat	ion:
mpermissible Combinat Major in Mathematics; Mat	ion: hematics/Physics
mpermissible Combinat Major in Mathematics; Mat Required courses (36 c	ion: hematics/Physics redits)
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mpermissible Combinat Major in Mathematics; Mat Required courses (36 c 1. Introductory level co MATH1111 Linear algeb	ion: hematics/Physics redits) urses (12 credits) (note 2) ra 6
mpermissible Combinat Major in Mathematics; Mat Required courses (36 c 1. Introductory level co	ion: hematics/Physics redits) urses (12 credits) (note 2) ra 6
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mpermissible Combinat Major in Mathematics; Mat Required courses (36 c 1. Introductory level co MATH1111 Linear algeb Plus one of the following MATH1211 Multivariable MATH1805 University math	ion: hematics/Physics redits) urses (12 credits) (note 2) ra 6 courses: calculus 6 athematics B 6 il methods for actuarial science 6
mpermissible Combinat Major in Mathematics; Mat Required courses (36 c 1. Introductory level co MATH1111 Linear algeb Plus one of the following MATH1211 Multivariable MATH1805 University m MATH1813 Mathematica 2. Advanced level cours	ion: hematics/Physics redits) urses (12 credits) (note 2) ra 6 courses: calculus 6 athematics B 6 il methods for actuarial science 6 ses (24 credits) ed level Mathematics courses (MATH2XXX or MATH3XXX or MATH6XXX level), subject to
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mpermissible Combinat Major in Mathematics; Mat Required courses (36 c 1. Introductory level co MATH1111 Linear algeb Plus one of the following MATH1211 Multivariable MATH1805 University ma MATH1813 Mathematica 2. Advanced level cours Any 24 credits of advance prerequisite requirements	ion: hematics/Physics redits) urses (12 credits) (note 2) ra 6 courses: calculus 6 athematics B 6 il methods for actuarial science 6 ses (24 credits) ed level Mathematics courses (MATH2XXX or MATH3XXX or MATH6XXX level), subject to s.
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	Minor in Mathematics
Offered to students admitted to Year 1 in	2010-2011
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	l and describe fundamental concepts of mathematics tutorial classes and project-based learning in the curriculum)
b. to be able to apply math (by means of coursework,	ematical methods and analysis to real life problems tutorial classes and project-based learning in the curriculum)
	ate and discuss scientific issues related to mathematics tutorial classes and presentation opportunities in the curriculum)
<ol><li>AL Pure Mathematics; o</li></ol>	ematics and AS Mathematics and Statistics; or r asic calculus (for those with HKCEE Math only) or a pass in MATH1804 University mathematics A (fo
Minimum Credit Require	ment:
00 anadita (10 anadita intra.	
Impermissible Combinat	
mpermissible Combinat	ion:
Impermissible Combinati Major in Mathematics; Mat Required courses (36 c	ion: hematics/Physics redits)
mpermissible Combinati Major in Mathematics; Mat Required courses (36 c 1. Introductory level co	ion: hematics/Physics redits) urses (12 credits) (note 2)
Impermissible Combinati Major in Mathematics; Mat Required courses (36 c	ion: hematics/Physics redits) urses (12 credits) (note 2)
Impermissible Combination Major in Mathematics; Mat Required courses (36 c 1. Introductory level co	ion: hematics/Physics redits) urses (12 credits) (note 2) ra 6
Impermissible Combination Major in Mathematics; Materia Required courses (36 c 1. Introductory level co MATH1111 Linear algebra Plus one of the following MATH1211 Multivariable MATH1205 University materia	ion: hematics/Physics redits) urses (12 credits) (note 2) ra 6 courses: calculus 6
Impermissible Combination Major in Mathematics; Materia Required courses (36 c 1. Introductory level co MATH1111 Linear algebra Plus one of the following MATH1211 Multivariable MATH1205 University materia	hematics/Physics redits) urses (12 credits) (note 2) ra 6 courses: calculus 6 athematics B 6 I methods for actuarial science 6
Impermissible Combinati Major in Mathematics; Mat Required courses (36 c 1. Introductory level co MATH1111 Linear algebr Plus one of the following MATH1211 Multivariable MATH1805 University ma MATH1813 Mathematica 2. Advanced level cours	ion: hematics/Physics redits) urses (12 credits) (note 2) ra 6 courses: calculus 6 athematics B 6 I methods for actuarial science 6 ses (24 credits) ed level Mathematics courses (MATH2XXX or MATH3XXX or MATH6XXX level), subject to
Impermissible Combination Major in Mathematics; Material Required courses (36 c 1. Introductory level co MATH1111 Linear algebric Plus one of the following MATH1211 Multivariable MATH1805 University material MATH1813 Mathematica 2. Advanced level course Any 24 credits of advance prerequisite requirements Notes: 1 Students with different courses.	ion: hematics/Physics redits) urses (12 credits) (note 2) ra 6 courses: calculus 6 athematics B 6 I methods for actuarial science 6 ses (24 credits) ed level Mathematics courses (MATH2XXX or MATH3XXX or MATH6XXX level), subject to

Minor Title	Minor in Mathematics
Offered to students admitted to Year 1 in	2009-2010
designed for students who aims to nurture quantitative	rovides the students with fundamental undergraduate education in the subject. It is specifically are interested in the subject and those whose majors require sophisticated mathematical skills. I be reasoning, logical, analytical and critical thinking, innovative imagination, meticulous care to work is for problem-solving, and capability to tackle novel situations and ill-defined problems.
	and describe fundamental concepts of mathematics utorial classes and project-based learning in the curriculum)
	ematical methods and analysis to real life problems utorial classes and project-based learning in the curriculum)
	te and discuss scientific issues related to mathematics utorial classes and presentation opportunities in the curriculum)
Minimum Entry Requirem	ent:
	ematics and AS Mathematics and Statistics; or
<ol> <li>AL Pure Mathematics; or</li> <li>a pass in MATH0201 Bas hose with AS Math &amp; Stat of</li> </ol>	sic calculus (for those with HKCEE Math only) or a pass in MATH1804 University mathematics A (for
Minimum Credit Requiren 36 credits (12 credits introd	nent: uctory level & 24 credits advanced level courses)
mpermissible Combination Major in Mathematics; Math	
Required courses (36 cr	edits)
1. Introductory level cou	irses (12 credits) (note 2)
MATH1111 Linear algebra	a 6
Plus one of the following of	courses:
MATH1211 Multivariable	calculus 6
MATH1805 University ma MATH1813 Mathematical	thematics B 6 methods for actuarial science 6
2. Advanced level cours	
	ed level Mathematics courses (MATH2XXX or MATH3XXX or MATH6XXX level), subject to
Notes:	
	nathematics background must consult the Department of Mathematics for advice on the bridging
	rised to take also MATH1001.
courses are fulfilled. Studer	sibility rests with students to ensure that the required pre-requisites and co-requisite of selected nts must take and pass all required courses in the selected major or/and minor in order to satisfy the nents. Courses which appear in 2 or more majors or minors will only be counted once.

Minor Title	Minor in Microbiology
Offered to students	2012-2013

#### Objectives:

The aim of this minor is to provide students with a stimulating, valuable and enjoyable learning experience in microbiology, a key life science discipline for the 21st century. Microbiology lies at the heart of understanding human health and disease, environmental processes and protection and advances in biotechnology and industrial microbiology. The curriculum places a strong emphasis on modern molecular approaches and analytical techniques. Core courses provide training in fundamental scientific skills and students also have the flexibility to choose form a variety of elective courses so that they may pursue their own interests in microbiology. Specialization is currently possible in medical microbiology, food microbiology, environmental microbiology and microbial biotechnology. Students interact closely with professors in a variety of interactive learning opportunities including laboratory classes and fieldtrips, seminars, tutorials and group activities. The critical thinking and communication skills emphasized during learning in this major are highly sought-after by employers.

#### Learning Outcomes:

a. Students will acquire the ability to clearly describe selected concepts and advances in microbiology including: the evolution and diversity of microbial life, microbial physiology, the occurrence and role of microorganisms in natural environments, the role of microorganisms in disease and medicine, food production and spoilage, plus their applications in biotechnology. (achieved through lectures and interactive learning experiences)

b. Students will develop an understanding of broader scientific concepts, and be able to relate these to scientific issues of significance in their daily lives and also of more global significance. (achieved through lectures and interactive learning experiences)

c. Students will develop their skills in critical thinking and the ability to recognize real-world situations where they may apply these skills.

(achieved through problem-based learning experiences)

d. Students will improve their oral and written communication skills, and gain confidence in interacting with their peers and professors individually and as part of a team. (achieved through interactive learning experiences)

#### Minimum Entry Requirement:

AL Biology or equivalent, or a pass in BIOL0126 Fundamentals of biology

#### Minimum Credit Requirement:

36 credits (12 credits introductory level & 24 credits advanced level courses)

#### Impermissible Combination:

Major in Microbiology

#### Required courses (36 credits)

#### 1. Introductory level courses (12 credits)

12 credits of the following courses:

BIOL0135 Introductory microbiology 6 BIOL1125 Introduction to biochemistry OR BIOC1001 Basic biochemistry 6 BIOL1133 Biological science laboratory course 6

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

At least 12 credits of the following courses:

BIOL2111 Molecular microbiology 6 BIOL2205 Immunology 6 BIOL2303 Molecular biology 6 BIOL2324 Microbial physiology and biochemistry 6

Plus at least 12 credits of the following:

BIOL2515 Food microbiology 6 BIOL2606 Environmental microbiology 6 BIOL3219 Clinical microbiology and applied immunology 6 BIOL3317 Microbial biotechnology 6

#### Remarks:

Minor Title	Minor in Microbiology
Offered to students	2011-2012

#### Objectives:

The aim of this minor is to provide students with a stimulating, valuable and enjoyable learning experience in microbiology, a key life science discipline for the 21st century. Microbiology lies at the heart of understanding human health and disease, environmental processes and protection and advances in biotechnology and industrial microbiology. The curriculum places a strong emphasis on modern molecular approaches and analytical techniques. Core courses provide training in fundamental scientific skills and students also have the flexibility to choose form a variety of elective courses so that they may pursue their own interests in microbiology. Specialization is currently possible in medical microbiology, food microbiology, environmental microbiology and microbial biotechnology. Students interact closely with professors in a variety of interactive learning opportunities including laboratory classes and fieldtrips, seminars, tutorials and group activities. The critical thinking and communication skills emphasized during learning in this major are highly sought-after by employers.

#### Learning Outcomes:

a. Students will acquire the ability to clearly describe selected concepts and advances in microbiology including: the evolution and diversity of microbial life, microbial physiology, the occurrence and role of microorganisms in natural environments, the role of microorganisms in disease and medicine, food production and spoilage, plus their applications in biotechnology. (achieved through lectures and interactive learning experiences)

b. Students will develop an understanding of broader scientific concepts, and be able to relate these to scientific issues of significance in their daily lives and also of more global significance. (achieved through lectures and interactive learning experiences)

c. Students will develop their skills in critical thinking and the ability to recognize real-world situations where they may apply these skills.

(achieved through problem-based learning experiences)

d. Students will improve their oral and written communication skills, and gain confidence in interacting with their peers and professors individually and as part of a team. (achieved through interactive learning experiences)

#### Minimum Entry Requirement:

AL Biology or equivalent, or a pass in BIOL0126 Fundamentals of biology

#### Minimum Credit Requirement:

36 credits (12 credits introductory level & 24 credits advanced level courses)

#### Impermissible Combination:

Major in Microbiology

#### Required courses (36 credits)

#### 1. Introductory level courses (12 credits)

12 credits of the following courses:

BIOL0135 Introductory microbiology 6 BIOL1125 Introduction to biochemistry OR BIOC1001 Basic biochemistry 6 BIOL1133 Biological science laboratory course 6

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

At least 12 credits of the following courses:

BIOL2111 Molecular microbiology 6 BIOL2205 Immunology 6 BIOL2303 Molecular biology 6 BIOL2324 Microbial physiology and biochemistry 6

Plus at least 12 credits of the following:

BIOL2515 Food microbiology 6 BIOL2606 Environmental microbiology 6 BIOL3219 Clinical microbiology and applied immunology 6 BIOL3317 Microbial biotechnology 6

#### Remarks:

Minor Title	Minor in Microbiology
Offered to students	2010-2011

#### **Objectives:**

The aim of this minor is to provide students with a stimulating, valuable and enjoyable learning experience in microbiology, a key life science discipline for the 21st century. Microbiology lies at the heart of understanding human health and disease, environmental processes and protection and advances in biotechnology and industrial microbiology. The curriculum places a strong emphasis on modern molecular approaches and analytical techniques. Core courses provide training in fundamental scientific skills and students also have the flexibility to choose form a variety of elective courses so that they may pursue their own interests in microbiology. Specialization is currently possible in medical microbiology, food microbiology, environmental microbiology and microbial biotechnology. Students interact closely with professors in a variety of interactive learning opportunities including laboratory classes and fieldtrips, seminars, tutorials and group activities. The critical thinking and communication skills emphasized during learning in this major are highly sought-after by employers.

#### Learning Outcomes:

a. Students will acquire the ability to clearly describe selected concepts and advances in microbiology including: the evolution and diversity of microbial life, microbial physiology, the occurrence and role of microorganisms in natural environments, the role of microorganisms in disease and medicine, food production and spoilage, plus their applications in biotechnology. (achieved through lectures and interactive learning experiences)

b. Students will develop an understanding of broader scientific concepts, and be able to relate these to scientific issues of significance in their daily lives and also of more global significance. (achieved through lectures and interactive learning experiences)

c. Students will develop their skills in critical thinking and the ability to recognize real-world situations where they may apply these skills.

(achieved through problem-based learning experiences)

d. Students will improve their oral and written communication skills, and gain confidence in interacting with their peers and professors individually and as part of a team. (achieved through interactive learning experiences)

#### Minimum Entry Requirement:

AL Biology or equivalent, or a pass in BIOL0126 Fundamentals of biology

#### Minimum Credit Requirement:

36 credits (12 credits introductory level & 24 credits advanced level courses)

#### Impermissible Combination:

Major in Microbiology

#### Required courses (36 credits)

#### 1. Introductory level courses (12 credits)

12 credits of the following courses:

BIOL0135 Introductory microbiology 6 BIOL1125 Introduction to biochemistry OR BIOC1001 Basic biochemistry 6 BIOL1133 Biological science laboratory course 6

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

At least 12 credits of the following courses:

BIOL2111 Molecular microbiology 6 BIOL2205 Immunology 6 BIOL2303 Molecular biology 6 BIOL2324 Microbial physiology and biochemistry 6

Plus at least 12 credits of the following:

BIOL2515 Food microbiology 6 BIOL2606 Environmental microbiology 6 BIOL3219 Clinical microbiology and applied immunology 6 BIOL3317 Microbial biotechnology 6

#### Remarks:

Minor Title	Minor in Microbiology
Offered to students	2009-2010

#### **Objectives:**

The aim of this minor is to provide students with a stimulating, valuable and enjoyable learning experience in microbiology, a key life science discipline for the 21st century. Microbiology lies at the heart of understanding human health and disease, environmental processes and protection and advances in biotechnology and industrial microbiology. The curriculum places a strong emphasis on modern molecular approaches and analytical techniques. Core courses provide training in fundamental scientific skills and students also have the flexibility to choose form a variety of elective courses so that they may pursue their own interests in microbiology. Specialization is currently possible in medical microbiology, food microbiology, environmental microbiology and microbial biotechnology. Students interact closely with professors in a variety of interactive learning opportunities including laboratory classes and fieldtrips, seminars, tutorials and group activities. The critical thinking and communication skills emphasized during learning in this major are highly sought-after by employers.

#### Learning Outcomes:

a. Students will acquire the ability to clearly describe selected concepts and advances in microbiology including: the evolution and diversity of microbial life, microbial physiology, the occurrence and role of microorganisms in natural environments, the role of microorganisms in disease and medicine, food production and spoilage, plus their applications in biotechnology. (achieved through lectures and interactive learning experiences)

b. Students will develop an understanding of broader scientific concepts, and be able to relate these to scientific issues of significance in their daily lives and also of more global significance. (achieved through lectures and interactive learning experiences)

c. Students will develop their skills in critical thinking and the ability to recognize real-world situations where they may apply these skills.

(achieved through problem-based learning experiences)

d. Students will improve their oral and written communication skills, and gain confidence in interacting with their peers and professors individually and as part of a team. (achieved through interactive learning experiences)

#### Minimum Entry Requirement:

AL Biology or equivalent, or a pass in BIOL0126 Fundamentals of biology

#### Minimum Credit Requirement:

36 credits (12 credits introductory level & 24 credits advanced level courses)

#### Impermissible Combination:

Major in Microbiology

#### **Required courses (36 credits)**

#### 1. Introductory level courses (12 credits)

12 credits of the following courses:

BIOL0129 Introductory microbiology (note 1) (3) OR BIOL0135 Introductory microbiology 6 BIOL0131 Basic medical microbiology (note 1) 3 BIOL1125 Introduction to biochemistry OR BIOC1001 Basic biochemistry 6 BIOL1133 Biological science laboratory course 6

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

At least 12 credits of the following courses:

BIOL2111 Molecular microbiology 6 BIOL2205 Immunology 6 BIOL2303 Molecular biology 6 BIOL2324 Microbial physiology and biochemistry 6

Plus at least 12 credits of the following:

BIOL2515 Food microbiology 6 BIOL2606 Environmental microbiology 6 BIOL3219 Clinical microbiology and applied immunology 6 BIOL3317 Microbial biotechnology 6

#### Notes:

1 Not available in 2010-2011 or thereafter.

#### 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 major or/and minor in order to satisfy the degree graduation requirements. Courses which appear in 2 or more majors or minors will only be counted once.

Minor Title	Minor in Physics
Offered to students admitted to Year 1 in	2012-2013
taste of the subject through	ended to provide interested students a fundamental outlook on the subject. Students would acquire a a large selection of elective courses which provides them to pursue a wide range of topics from the terials to the large scale of astrophysics.
	to identify and describe physical systems with fundamental knowledge in physics. nd tutorial classes in the curriculum)
	to analyze some physics problems qualitatively and quantitatively. tutorial classes and laboratory works in the curriculum)
	to communicate and collaborate with people effectively in scientific issues. s, tutorial sessions and presentation opportunities in the curriculum)
Minimum Entry Requirem	ont
	neering Science; or a pass in PHYS0625 Physics by inquiry or equivalent
AL / AS Physics or AL Engi Minimum Credit Requiren	neering Science; or a pass in PHYS0625 Physics by inquiry or equivalent nent:
AL / AS Physics or AL Engi Minimum Credit Requiren 36 credits (12 credits introd Impermissible Combinatio	neering Science; or a pass in PHYS0625 Physics by inquiry or equivalent nent: luctory level & 24 credits advanced level courses) on:
AL / AS Physics or AL Engi Minimum Credit Requiren 36 credits (12 credits introd Impermissible Combination Major in Mathematics/Phys	ineering Science; or a pass in PHYS0625 Physics by inquiry or equivalent nent: luctory level & 24 credits advanced level courses) on: ics; Physics
AL / AS Physics or AL Engi Minimum Credit Requiren 36 credits (12 credits introd Impermissible Combinatio	ineering Science; or a pass in PHYS0625 Physics by inquiry or equivalent nent: luctory level & 24 credits advanced level courses) on: ics; Physics redits)
AL / AS Physics or AL Engi Minimum Credit Requiren 36 credits (12 credits introd Impermissible Combination Major in Mathematics/Physical Required courses (36 cr	ineering Science; or a pass in PHYS0625 Physics by inquiry or equivalent nent: luctory level & 24 credits advanced level courses) on: ics; Physics redits) urses (12 credits)
AL / AS Physics or AL Engi Minimum Credit Requiren 36 credits (12 credits introd Impermissible Combinatio Major in Mathematics/Phys Required courses (36 cr 1. Introductory level cou PHYS1417 Basic physics	ineering Science; or a pass in PHYS0625 Physics by inquiry or equivalent nent: luctory level & 24 credits advanced level courses) on: ics; Physics redits) urses (12 credits)
AL / AS Physics or AL Engi Minimum Credit Requiren 36 credits (12 credits introd Impermissible Combinatio Major in Mathematics/Phys Required courses (36 cr 1. Introductory level cou PHYS1417 Basic physics	ineering Science; or a pass in PHYS0625 Physics by inquiry or equivalent nent: luctory level & 24 credits advanced level courses) on: ics; Physics redits) urses (12 credits) 6 htroductory level Physics course (PHYS0XXX or PHYS1XXX level) (note 1) ics I 6
AL / AS Physics or AL Engi Minimum Credit Requiren 36 credits (12 credits introd Impermissible Combination Major in Mathematics/Physics Required courses (36 cr 1. Introductory level cou PHYS1417 Basic physics Plus at least 6 credits of ir Or PHYS1414 General physi	ineering Science; or a pass in PHYS0625 Physics by inquiry or equivalent nent: luctory level & 24 credits advanced level courses) on: ics; Physics redits) urses (12 credits) 6 htroductory level Physics course (PHYS0XXX or PHYS1XXX level) (note 1) ics I 6 ics I 6
AL / AS Physics or AL Engi Minimum Credit Requiren 36 credits (12 credits introd Impermissible Combinatie Major in Mathematics/Phys Required courses (36 cr 1. Introductory level cou PHYS1417 Basic physics Plus at least 6 credits of ir Or PHYS1414 General physi PHYS1415 General physi 2. Advanced level cours	ineering Science; or a pass in PHYS0625 Physics by inquiry or equivalent nent: luctory level & 24 credits advanced level courses) on: ics; Physics redits) urses (12 credits) 6 htroductory level Physics course (PHYS0XXX or PHYS1XXX level) (note 1) ics I 6 ics I 6

#### Notes:

Refer to the Physics Department website http://www.physics.hku.hk for suggested curriculum. 1 Students are strongly advised to take at least one of the following courses: PHYS1414 or PHYS1415 to allow for maximum flexibility in course selection for advanced level Physics courses.

Remarks:

Minor Title	Minor in Physics						
Offered to students admitted to Year 1 in	2011-2012						
taste of the subject through	ended to provide interested students a fundamental outlook on the subject. Students would acquire a a large selection of elective courses which provides them to pursue a wide range of topics from the terials to the large scale of astrophysics.						
	to identify and describe physical systems with fundamental knowledge in physics. nd tutorial classes in the curriculum)						
	to analyze some physics problems qualitatively and quantitatively. autorial classes and laboratory works in the curriculum)						
	to communicate and collaborate with people effectively in scientific issues. s, tutorial sessions and presentation opportunities in the curriculum)						
Minimum Entry Requirem AL / AS Physics or AL Engi	ent: neering Science; or a pass in PHYS0625 Physics by inquiry or equivalent						
Minimum Credit Requiren 36 credits (12 credits introd	nent: uctory level & 24 credits advanced level courses)						
Impermissible Combination Major in Mathematics/Phys							
Required courses (36 cr	edits)						
1. Introductory level cou	irses (12 credits)						
PHYS1417 Basic physics	6						
Plus at least 6 credits of in	ntroductory level Physics course (PHYS0XXX or PHYS1XXX level) (note 1)						
Or PHYS1414 General physi PHYS1415 General physi							
2. Advanced level cours	es (24 credits)						

2. Advanced level courses (24 credits)

Any 24 credits of advanced level Physics courses (PHYS2XXX or PHYS3XXX or PHYS6XXX level), subject to prerequisite requirements.

#### Notes:

Refer to the Physics Department website http://www.physics.hku.hk for suggested curriculum.

1 Students are strongly advised to take at least one of the following courses: PHYS1414 or PHYS1415 to allow for maximum flexibility in course selection for advanced level Physics courses.

Remarks:

	Minor in Physics						
Offered to students admitted to Year 1 in	2010-2011						
aste of the subject through	nded to provide interested students a fundamental outlook on the subject. Students would acquire a large selection of elective courses which provides them to pursue a wide range of topics from the erials to the large scale of astrophysics.						
	o identify and describe physical systems with fundamental knowledge in physics. Ind tutorial classes in the curriculum)						
	o analyze some physics problems qualitatively and quantitatively. Itorial classes and laboratory works in the curriculum)						
	o communicate and collaborate with people effectively in scientific issues. , tutorial sessions and presentation opportunities in the curriculum)						
<b>Minimum Entry Requireme</b> AL / AS Physics or AL Engin	ent: neering Science; or a pass in PHYS0625 Physics by inquiry or equivalent						
Minimum Credit Requirem 36 credits (12 credits introdu mpermissible Combinatio Major in Mathematics/Physic	ictory level & 24 credits advanced level courses) n:						
Required courses (36 cre	dits)						
1. Introductory level cour	rses (12 credits)						
PHYS1417 Basic physics 6	δ						
	troductory level Physics course (PHYS0XXX or PHYS1XXX level) (note 1)						
Plus at least 6 credits of in:							
Plus at least 6 credits of int Or PHYS1414 General physic PHYS1415 General physic							
Or PHYS1414 General physic	es II 6						

Refer to the Physics Department website http://www.physics.hku.hk for suggested curriculum. 1 Students are strongly advised to take at least one of the following courses: PHYS1414 or PHYS1415 to allow for maximum flexibility in course selection for advanced level Physics courses.

Remarks:

Minor Title	Minor in Physics
Offered to students admitted to Year 1 in	2009-2010
taste of the subject throug	ntended to provide interested students a fundamental outlook on the subject. Students would acquir gh a large selection of elective courses which provides them to pursue a wide range of topics from naterials to the large scale of astrophysics.
	le to identify and describe physical systems with fundamental knowledge in physics. and tutorial classes in the curriculum)
	le to analyze some physics problems qualitatively and quantitatively. , tutorial classes and laboratory works in the curriculum)
	le to communicate and collaborate with people effectively in scientific issues. cts, tutorial sessions and presentation opportunities in the curriculum)
	ment: Engineering Science; or a pass in PHYS0114 Fundamental physics I and PHYS0115 Fundamer IYS0625 Physics by inquiry or equivalent
Minimum Credit Require 36 credits (12 credits intro	ement: oductory level & 24 credits advanced level courses)
Impermissible Combinat Major in Mathematics/Phy	
Required courses (36 o	credits)
1. Introductory level co	ourses (12 credits)
PHYS1417 Basic physic	cs 6
Plus at least 6 credits of	f introductory level Physics course (PHYS0XXX or PHYS1XXX level) (note 1)
Or PHYS1414 General phys PHYS1415 General phys	
2. Advanced level cour	rses (24 credits)
Any 24 credits of advance requirements.	ced level Physics courses (PHYS2XXX or PHYS3XXX or PHYS6XXX level), subject to prerequisite
1 Students are strongly a	artment website http://www.physics.hku.hk for suggested curriculum. advised to take at least one of the following courses: PHYS1414 or PHYS1415 to allow for maxim ion for advanced level Physics courses.

Minor Title	Minor in Risk Management

Offered to students admitted to Year 1 in

2012-2013

#### Objectives:

The Risk Management minor 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 interest in Risk Management or to complement their major of study.

#### Learning Outcomes:

a. Students would 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)

b. Students would be able to apply elementary methods and models for risk assessment and management. (by means of coursework, tutorial classes and project-based learning in the curriculum)

c. Students would be able to acquire and interpret relevant data and information for risk management. (by means of coursework, tutorial classes and project-based learning in the curriculum)

#### Minimum Entry Requirement: NIL

#### Minimum Credit Requirement:

36 credits (12 credits introductory level & 24 credits advanced level courses)

#### Impermissible Combination:

Major in Risk Management

#### Required courses (36 credits)

#### 1. Introductory level courses (12 credits)

One of the following courses:

STAT0301 Elementary statistical methods 6 STAT0302 Business statistics 6 STAT1301 Probability and statistics I 6 STAT1306 Introductory statistics 6

Alternative courses possible in the case of students taking Major/Minor in Statistics with an overlap of core courses: Any 6-credit advanced level statistics courses (STAT2XXX, STAT3XXX or STAT6XXX level), subject to the Department's approval.

Plus at least 6 credits of the following courses:

STAT1302 Probability and statistics II 6 STAT1303 Data management 6 One of the advanced level courses listed below 6

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

At least 24 credits of the following courses:

STAT2309 The statistics of investment risk 6 STAT2310 Risk management and insurance 6 STAT2311 Computer-aided data analysis 6 STAT2312 Data mining 6 STAT2314 Business forecasting 6 STAT2315 Practical mathematics for investment 6 STAT3301 Time-series analysis 6 STAT3303 Derivatives and risk management 6 STAT3320 Risk management and Basel Accords in banking and finance 6 STAT3321 Credit risk analysis 6 STAT3322 Market risk analysis 6 STAT3323 Current topics in risk management 6

#### Remarks:

Minor Title	Minor in Risk Management
Offered to students	2011-2012

Offered to students admitted to Year 1 in

ents 20

#### Objectives:

The Risk Management minor 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 interest in Risk Management or to complement their major of study.

#### Learning Outcomes:

a. Students would 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)

b. Students would be able to apply elementary methods and models for risk assessment and management. (by means of coursework, tutorial classes and project-based learning in the curriculum)

c. Students would be able to acquire and interpret relevant data and information for risk management. (by means of coursework, tutorial classes and project-based learning in the curriculum)

#### Minimum Entry Requirement: NIL

#### Minimum Credit Requirement:

36 credits (12 credits introductory level & 24 credits advanced level courses)

#### Impermissible Combination:

Major in Risk Management

#### Required courses (36 credits)

#### 1. Introductory level courses (12 credits)

One of the following courses:

STAT0301 Elementary statistical methods 6 STAT1301 Probability and statistics I 6 STAT1306 Introductory statistics 6 STAT0302 Business statistics 6

Alternative courses possible in the case of students taking Major/Minor in Statistics with an overlap of core courses: Any 6-credit advanced level statistics courses (STAT2XXX, STAT3XXX or STAT6XXX level), subject to the Department's approval.

Plus at least 6 credits of the following courses:

STAT1302 Probability and statistics II 6 STAT1303 Data management 6 One of the advanced level courses listed below 6

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

At least 24 credits of the following courses:

STAT2309 The statistics of investment risk 6 STAT2310 Risk management and insurance 6 STAT2311 Computer-aided data analysis 6 STAT2312 Data mining 6 STAT2314 Business forecasting 6 STAT2315 Practical mathematics for investment 6 STAT3301 Time-series analysis 6 STAT3303 Derivatives and risk management 6 STAT3320 Risk management and Basel Accords in banking and finance 6 STAT3321 Credit risk analysis 6 STAT3322 Market risk analysis 6 STAT3323 Current topics in risk management 6

#### Remarks:

Minor Title	Minor in Risk Management
Offered to students admitted to Year 1 in	2010-2011
skills of employing various	nor aims to provide interested students with basic concepts of risk management and fundamental statistical techniques for managing risk. The minor curriculum is particularly designed for students ance their interest in Risk Management or to complement their major of study.
	pasic understanding and identify the generic risk management issues and techniques. utorial classes and project-based learning in the curriculum)
	o apply elementary methods and models for risk assessment and management. utorial classes and project-based learning in the curriculum)
	o acquire and interpret relevant data and information for risk management. utorial classes and project-based learning in the curriculum)
Minimum Entry Requirem	ent:
Minimum Credit Requirem	nent: uctory level & 24 credits advanced level courses)
Impermissible Combination Major in Risk Management	
Required courses (36 cr	
1. Introductory level cou	
One of the following cours	les:
STAT0301 Elementary sta STAT1301 Probability and STAT1306 Introductory st STAT0302 Business statis	d statistics I 6 atistics 6
	ole in the case of students taking Major/Minor in Statistics with an overlap of core courses: el statistics courses (STAT2XXX, STAT3XXX or STAT6XXX level), subject to the Department's
Plus at least 6 credits of the	ne following courses:
STAT1302 Probability and STAT1303 Data manager	
One of the advanced leve	I courses listed below 6
One of the advanced leve 2. Advanced level cours	

At least 24 credits of the following courses:

STAT2309 The statistics of investment risk 6 STAT2310 Risk management and insurance 6 STAT2311 Computer-aided data analysis 6 STAT2312 Data mining 6 STAT2314 Business forecasting 6 STAT2315 Practical mathematics for investment 6 STAT3301 Time-series analysis 6 STAT3303 Derivatives and risk management 6 STAT3320 Risk management and Basel Accords in banking and finance/Risk management and Basel II in banking and finance 6 STAT3321 Credit risk analysis 6 STAT3322 Market risk analysis 6

#### Remarks:

Minor Title	Minor in Risk Management
Offered to students admitted to Year 1 in	2009-2010
skills of employing various	inor aims to provide interested students with basic concepts of risk management and fundamenta s statistical techniques for managing risk. The minor curriculum is particularly designed for student hance their interest in Risk Management or to complement their major of study.
	basic understanding and identify the generic risk management issues and techniques. tutorial classes and project-based learning in the curriculum)
	to apply elementary methods and models for risk assessment and management. tutorial classes and project-based learning in the curriculum)
	to acquire and interpret relevant data and information for risk management. tutorial classes and project-based learning in the curriculum)
Minimum Entry Requiren	nent:
Minimum Credit Require 36 credits (12 credits intro	ment: ductory level & 24 credits advanced level courses)
I <b>mpermissible Combinat</b> Major in Risk Managemen Minor in Statistics	
Required courses (36 c	redits)
1. Introductory level co	urses (12 credits)
One of the following cour	'ses:
STAT1301 Probability an STAT1306 Introductory s STAT0302 Business stat	nd statistics I 6 statistics 6
Plus at least 6 credits of	
STAT1302 Probability an STAT1303 Data manage One of the advanced leve	ement 6
2. Advanced level cours	ses (24 credits)
At least 24 credits of the	
STAT2320 (note 1) / STA	ment and insurance 6 led data analysis 6 6 ecasting 6 hematics for investment 6 AT3320 Risk management and Basel Accords in banking and finance/Risk management and Basel II
in banking and finance 6 STAT2812 Financial eco STAT3301 Time-series a STAT3308 Financial eng STAT3321 Credit risk an	nomics I 6 analysis 6 ineering (note 1) OR STAT3303 Derivatives and risk management 6
STAT3322 Market risk ar STAT3821 Financial eco	
<b>Notes:</b> 1 Not available in 2010-20	11 or thereafter.

#### Remarks:

Minor Title	Minor in Statistics
Offered to students admitted to Year 1 in	2012-2013
	istics minor is structured specifically to cater for the genera

al 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:

a. Students would 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)

b. Students would be equipped with computational skills essential to conducting complete data analyses. (by means of coursework, tutorial classes, project-based learning and presentation opportunities in the curriculum)

c. Students would be able to 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)

#### Minimum Entry Requirement:

NIL

#### Minimum Credit Requirement:

36 credits (12 credits introductory level & 24 credits advanced level courses)

#### Impermissible Combination:

Major in Statistics

#### Required courses (36 credits)

#### 1. Introductory level courses (12 credits)

One of the following courses:

STAT0301 Elementary statistical methods 6 STAT0302 Business statistics 6 STAT1301 Probability and statistics I 6 STAT1306 Introductory statistics 6

Plus at least 6 credits of the following courses:

STAT1302 Probability and statistics II 6 STAT1303 Data management 6 STAT1323 Introduction to demographic and socio-economic statistics 6

Alternative courses possible in the case of students taking Major/Minor in Risk Management with an overlap of core courses: Any 6-credit advanced level statistics courses (STAT2XXX, STAT3XXX or STAT6XXX level), subject to the Department's approval.

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

At least 24 credits of the following courses:

STAT2301 Linear statistical analysis 6 STAT2302 Statistical inference 6 STAT2303 Probability modelling 6 STAT2304 Design and analysis of experiments 6 STAT2305 Quality control and management 6 STAT2306 Business logistics 6 STAT2307 Statistics in clinical medicine & bio-medical research 6 STAT2308 Statistical genetics 6 STAT2311 Computer-aided data analysis 6 STAT2312 Data mining 6 STAT2313 Marketing engineering 6 STAT2314 Business forecasting 6 STAT2317 Sample survey methods 6 STAT3301 Time-series analysis 6 STAT3302 Multivariate data analysis 6 STAT2316 Advanced SAS programming 6 STAT3306 Selected topics in statistics 6 STAT3811 Survival analysis 6 Any 6-credit advanced level statistics courses (STAT2XXX, STAT3XXX or STAT6XXX level), subject to the Department's approval 6

#### Remarks:

Minor Title	Minor in Statistics
Offered to students	2011-2012

#### **Objectives:**

The curriculum of the Statistics minor 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:

a. Students would 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)

b. Students would be equipped with computational skills essential to conducting complete data analyses. (by means of coursework, tutorial classes, project-based learning and presentation opportunities in the curriculum)

c. Students would be able to 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)

#### Minimum Entry Requirement:

NIL

#### Minimum Credit Requirement:

36 credits (12 credits introductory level & 24 credits advanced level courses)

#### Impermissible Combination:

Major in Statistics

#### Required courses (36 credits)

#### 1. Introductory level courses (12 credits)

One of the following courses:

STAT0301 Elementary statistical methods 6 STAT0302 Business statistics 6 STAT1301 Probability and statistics I 6 STAT1306 Introductory statistics 6

Plus at least 6 credits of the following courses:

STAT1302 Probability and statistics II 6 STAT1303 Data management 6 STAT1304 Design and analysis of sample surveys 6

Alternative courses possible in the case of students taking Major/Minor in Risk Management with an overlap of core courses: Any 6-credit advanced level statistics courses (STAT2XXX, STAT3XXX or STAT6XXX level), subject to the Department's approval.

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

At least 24 credits of the following courses:

STAT2301 Linear statistical analysis 6 STAT2302 Statistical inference 6 STAT2303 Probability modelling 6 STAT2304 Design and analysis of experiments 6 STAT2305 Quality control and management 6 STAT2306 Business logistics 6 STAT2307 Statistics in clinical medicine & bio-medical research 6 STAT2308 Statistical genetics 6 STAT2311 Computer-aided data analysis 6 STAT2312 Data mining 6 STAT2313 Marketing engineering 6 STAT2314 Business forecasting 6 STAT3301 Time-series analysis 6 STAT3302 Multivariate data analysis 6 STAT3304 Computer-aided statistical modelling 6 STAT3306 Selected topics in statistics 6 STAT3316 Advanced probability 6 STAT3317 Computational statistics 6 STAT3811 Survival analysis 6

Ainor Title	Minor in Statistics
Dffered to students admitted to Year 1 in	2010-2011
provide basic training in statistic	s minor is structured specifically to cater for the general need of non-statistical disciplines and cal methodologies and their applications to practical problems. It aims to provide students with antitative reasoning that has become an indispensable skill in nearly all disciplines.
statistical methods and insightfu	c statistical knowledge alongside their major disciplines, with emphases on correct applications o Il interpretations of statistical findings. ial classes and project-based learning in the curriculum)
	with computational skills essential to conducting complete data analyses. ial classes, project-based learning and presentation opportunities in the curriculum)
provide guidance on all aspects	participate proactively in large-scale, multi-disciplinary studies, determine objective findings, an s of data collection and analyses. ial classes and project-based learning in the curriculum)
Minimum Entry Requirement:	
NIL Ainimum Cradit Baguiramant	
Minimum Credit Requirement 36 credits (12 credits introducto	:: ry level & 24 credits advanced level courses)
mpermissible Combination: Major in Statistics	
Required courses (36 credit	
1. Introductory level course	s (12 credits)
One of the following courses:	
STAT0301 Elementary statisti STAT0302 Business statistics STAT1301 Probability and sta STAT1306 Introductory statist	i 6 itistics I 6
· · · · · · · · · · · · · · · · · · ·	
Plus at least 6 credits of the fo	ollowing courses:
Plus at least 6 credits of the for STAT1302 Probability and sta STAT1303 Data management STAT1304 Design and analys	tistics II 6 t 6
STAT1302 Probability and sta STAT1303 Data management STAT1304 Design and analys Alternative courses possible in	tistics II 6 t 6
STAT1302 Probability and sta STAT1303 Data management STAT1304 Design and analys Alternative courses possible in Any 6-credit advanced level st	tistics II 6 t 6 sis of sample surveys 6 n the case of students taking Major/Minor in Risk Management with an overlap of core courses: tatistics courses (STAT2XXX, STAT3XXX or STAT6XXX level), subject to the Department's
STAT1302 Probability and sta STAT1303 Data management STAT1304 Design and analys Alternative courses possible in Any 6-credit advanced level st approval.	titistics II 6 t 6 sis of sample surveys 6 in the case of students taking Major/Minor in Risk Management with an overlap of core courses: tatistics courses (STAT2XXX, STAT3XXX or STAT6XXX level), subject to the Department's <b>24 credits)</b>
STAT1302 Probability and sta STAT1303 Data management STAT1304 Design and analys Alternative courses possible in Any 6-credit advanced level st approval. <b>2. Advanced level courses (</b> At least 24 credits of the follow STAT2301 Linear statistical an STAT2302 Statistical inference STAT2303 Probability modelli STAT2304 Design and analys STAT2305 Quality control and STAT2306 Business logistics	titistics II 6 t 6 is of sample surveys 6 in the case of students taking Major/Minor in Risk Management with an overlap of core courses: tatistics courses (STAT2XXX, STAT3XXX or STAT6XXX level), subject to the Department's <b>24 credits)</b> ving courses: nalysis 6 e 6 ng 6 is of experiments 6 d management 6 6
STAT1302 Probability and sta STAT1303 Data management STAT1304 Design and analys Alternative courses possible in Any 6-credit advanced level si approval. <b>2. Advanced level courses (</b> At least 24 credits of the follow STAT2301 Linear statistical at STAT2302 Statistical inference STAT2303 Probability modelli STAT2304 Design and analys STAT2305 Quality control and STAT2306 Business logistics STAT2307 Statistical in clinica STAT2308 Statistical genetics STAT2311 Computer-aided d STAT2312 Data mining 6	Attistics II 6 t 6 sis of sample surveys 6 in the case of students taking Major/Minor in Risk Management with an overlap of core courses: tatistics courses (STAT2XXX, STAT3XXX or STAT6XXX level), subject to the Department's <b>24 credits)</b> wing courses: nalysis 6 e 6 ng 6 sis of experiments 6 d management 6 6 I medicine & bio-medical research 6 s 6 ata analysis 6
STAT1302 Probability and sta STAT1303 Data management STAT1304 Design and analys Alternative courses possible in Any 6-credit advanced level si approval. <b>2. Advanced level courses (</b> At least 24 credits of the follow STAT2301 Linear statistical an STAT2302 Statistical inferenc STAT2303 Probability modelli STAT2304 Design and analys STAT2305 Quality control and STAT2305 Gusiness logistics STAT2307 Statistics in clinica STAT2308 Statistical genetics STAT2311 Computer-aided di	titistics II 6 t 6 sis of sample surveys 6 in the case of students taking Major/Minor in Risk Management with an overlap of core courses: tatistics courses (STAT2XXX, STAT3XXX or STAT6XXX level), subject to the Department's <b>24 credits)</b> wing courses: nalysis 6 e 6 ng 6 sis of experiments 6 d management 6 6 I medicine & bio-medical research 6 s 6 ata analysis 6 ering 6 ng 6 sis 6
STAT1302 Probability and sta STAT1303 Data management STAT1304 Design and analys Alternative courses possible in Any 6-credit advanced level st approval. <b>2. Advanced level courses (</b> At least 24 credits of the follow STAT2301 Linear statistical at STAT2302 Statistical inference STAT2303 Probability modelli STAT2304 Design and analys STAT2305 Quality control and STAT2306 Business logistics STAT2307 Statistical genetics STAT2308 Statistical genetics STAT2311 Computer-aided d STAT2312 Data mining 6 STAT2313 Marketing enginee STAT2314 Business forecasti STAT3302 Multivariate data a STAT3302 Multivariate data a	tistics II 6 t6 is of sample surveys 6 in the case of students taking Major/Minor in Risk Management with an overlap of core courses: tatistics courses (STAT2XXX, STAT3XXX or STAT6XXX level), subject to the Department's <b>24 credits)</b> wing courses: nalysis 6 e 6 ng 6 is of experiments 6 d management 6 6 I medicine & bio-medical research 6 s 6 ata analysis 6 tring 6 ng 6 sis 6 inalysis 6 tatistical modelling 6
STAT1302 Probability and sta STAT1303 Data management STAT1304 Design and analys Alternative courses possible in Any 6-credit advanced level st approval. <b>2. Advanced level courses (</b> At least 24 credits of the follow STAT2301 Linear statistical at STAT2302 Statistical inference STAT2303 Probability modelli STAT2304 Design and analys STAT2305 Quality control and STAT2306 Business logistics STAT2307 Statistics in clinica STAT2308 Statistical genetics STAT2311 Computer-aided d STAT2312 Data mining 6 STAT2313 Marketing enginee STAT2314 Business forecasti STAT3301 Time-series analys STAT3302 Multivariate data at	tistics II 6 t6 is of sample surveys 6 in the case of students taking Major/Minor in Risk Management with an overlap of core courses: tatistics courses (STAT2XXX, STAT3XXX or STAT6XXX level), subject to the Department's <b>24 credits)</b> wing courses: nalysis 6 e 6 ng 6 is of experiments 6 d management 6 6 I medicine & bio-medical research 6 s 6 atta analysis 6 erring 6 ng 6 sis 6 inalysis 6 tatistical modelling 6 statistica modelling 6 statistics 6 lity 6

Minor Title	Minor in Statistics
Offered to students admitted to Year 1 in	2009-2010
provide basic training in statistica	minor is structured specifically to cater for the general need of non-statistical disciplines and al methodologies and their applications to practical problems. It aims to provide students with a antitative reasoning that has become an indispensable skill in nearly all disciplines.
statistical methods and insightful	statistical knowledge alongside their major disciplines, with emphases on correct applications o interpretations of statistical findings. Il classes and project-based learning in the curriculum)
	vith computational skills essential to conducting complete data analyses. I classes, project-based learning and presentation opportunities in the curriculum)
provide guidance on all aspects of	rticipate proactively in large-scale, multi-disciplinary studies, determine objective findings, and of data collection and analyses. I classes and project-based learning in the curriculum)
Minimum Entry Requirement: NIL	
Minimum Credit Requirement:	
	y level & 24 credits advanced level courses)
Impermissible Combination: Major in Risk Management; Stati Minor in Risk Management	stics
Required courses (36 credits)	)
1. Introductory level courses	(12 credits)
One of the following courses:	
STAT0301 Elementary statistic STAT0302 Business statistics 6 STAT1301 Probability and stati	6 istics I 6
STAT1306 Introductory statistic	x 6
Plus at least 6 credits of the foll	owing courses:
	stics    6
STAT1302 Probability and stati STAT1303 Data management 6 STAT1304 Design and analysis	6
STAT1303 Data management 6	6 s of sample surveys 6
STAT1303 Data management 6 STAT1304 Design and analysis	6 s of sample surveys 6 <b>4 credits)</b>
STAT1303 Data management 6 STAT1304 Design and analysis <b>2. Advanced level courses (2</b> At least 24 credits of the followi STAT2301 Linear statistical ana	6 s of sample surveys 6 <b>4 credits)</b> ing courses: alysis 6
STAT1303 Data management 6 STAT1304 Design and analysis <b>2. Advanced level courses (2</b> At least 24 credits of the followi STAT2301 Linear statistical ana STAT2302 Statistical inference STAT2303 Probability modelling	6 s of sample surveys 6 <b>4 credits)</b> ing courses: alysis 6 6 g 6
STAT1303 Data management 6 STAT1304 Design and analysis <b>2. Advanced level courses (2</b> At least 24 credits of the followi STAT2301 Linear statistical ana STAT2302 Statistical inference STAT2303 Probability modelling STAT2304 Design and analysis	6 s of sample surveys 6 <b>4 credits)</b> ing courses: alysis 6 6 g 6 g 6 s of experiments 6
STAT1303 Data management 6 STAT1304 Design and analysis <b>2. Advanced level courses (2</b> At least 24 credits of the followi STAT2301 Linear statistical ana STAT2302 Statistical inference STAT2303 Probability modelling STAT2304 Design and analysis STAT2305 Quality control and a STAT2306 Business logistics 6	6 s of sample surveys 6 <b>4 credits)</b> ing courses: alysis 6 6 g 6 s of experiments 6 management 6
STAT1303 Data management 6 STAT1304 Design and analysis <b>2. Advanced level courses (2</b> At least 24 credits of the followi STAT2301 Linear statistical ana STAT2302 Statistical inference STAT2303 Probability modelling STAT2304 Design and analysis STAT2305 Quality control and STAT2306 Business logistics 6	6 s of sample surveys 6 4 credits) ing courses: alysis 6 6 g 6 s of experiments 6 management 6 medicine & bio-medical research 6
STAT1303 Data management 6 STAT1304 Design and analysis <b>2. Advanced level courses (2</b> 4 At least 24 credits of the followi STAT2301 Linear statistical and STAT2302 Statistical inference STAT2303 Probability modelling STAT2304 Design and analysis STAT2305 Quality control and 1 STAT2306 Business logistics 6 STAT2307 Statistics in clinical STAT2308 Statistical genetics 6 STAT2309 The statistics of inve	6 s of sample surveys 6 4 credits) ing courses: alysis 6 6 g 6 s of experiments 6 management 6 
STAT1303 Data management 6 STAT1304 Design and analysis <b>2. Advanced level courses (24</b> At least 24 credits of the followi STAT2301 Linear statistical and STAT2302 Statistical inference STAT2303 Probability modelling STAT2304 Design and analysis STAT2305 Quality control and a STAT2306 Business logistics 6 STAT2307 Statistics in clinical a STAT2308 Statistical genetics 6 STAT2309 The statistics of inve STAT2310 Risk management a STAT2311 Computer-aided dat	6 s of sample surveys 6 4 credits) ing courses: alysis 6 6 g 6 s of experiments 6 management 6 medicine & bio-medical research 6 6 estment risk 6 and insurance 6
STAT1303 Data management 6 STAT1304 Design and analysis <b>2. Advanced level courses (2</b> 4 At least 24 credits of the followi STAT2301 Linear statistical and STAT2302 Statistical inference STAT2303 Probability modelling STAT2304 Design and analysis STAT2305 Quality control and a STAT2306 Business logistics 6 STAT2307 Statistics in clinical STAT2308 Statistical genetics 6 STAT2309 The statistics of inve STAT2310 Risk management a STAT2311 Computer-aided dat STAT2312 Data mining 6	6 s of sample surveys 6 4 credits) ing courses: alysis 6 6 g 6 s of experiments 6 management 6 immedicine & bio-medical research 6 6 estment risk 6 and insurance 6 ta analysis 6
STAT1303 Data management 6 STAT1304 Design and analysis <b>2. Advanced level courses (2</b> At least 24 credits of the followi STAT2301 Linear statistical and STAT2302 Statistical inference STAT2303 Probability modelling STAT2304 Design and analysis STAT2305 Quality control and of STAT2306 Business logistics 6 STAT2307 Statistics in clinical STAT2308 Statistical genetics 6 STAT2309 The statistics of inve STAT2310 Risk management a STAT2311 Computer-aided dat STAT2312 Data mining 6 STAT2313 Marketing engineeri STAT2314 Business forecasting	6 s of sample surveys 6 4 credits) ing courses: alysis 6 6 g 6 s of experiments 6 management 6 i medicine & bio-medical research 6 6 estment risk 6 and insurance 6 ta analysis 6 ing 6 g 6
STAT1303 Data management 6 STAT1304 Design and analysis <b>2. Advanced level courses (2</b> 4 At least 24 credits of the followi STAT2301 Linear statistical and STAT2302 Statistical inference STAT2303 Probability modelling STAT2304 Design and analysis STAT2305 Quality control and 1 STAT2306 Business logistics 6 STAT2307 Statistics in clinical 1 STAT2308 Statistical genetics 6 STAT2309 The statistics of inve STAT2310 Risk management a STAT2311 Computer-aided dat STAT2312 Data mining 6 STAT2313 Marketing engineeri STAT2314 Business forecasting STAT2315 Practical mathemati	6 s of sample surveys 6 4 credits) ing courses: alysis 6 6 9 6 5 of experiments 6 management 6 i medicine & bio-medical research 6 6 estment risk 6 and insurance 6 ta analysis 6 ing 6 g 6 jcs for investment 6
STAT1303 Data management ( STAT1304 Design and analysis <b>2. Advanced level courses (2</b> / At least 24 credits of the followi STAT2301 Linear statistical and STAT2302 Statistical inference STAT2303 Probability modelling STAT2304 Design and analysis STAT2305 Quality control and 1 STAT2306 Business logistics 6 STAT2307 Statistical genetics ( STAT2309 The statistics of inve STAT2310 Risk management a STAT2311 Computer-aided dat STAT2312 Data mining 6 STAT2313 Marketing engineeri STAT2314 Business forecasting STAT2315 Practical mathemati STAT2320 (note 1) / STAT3320 STAT2812 Financial economics	6 s of sample surveys 6 4 credits) ing courses: alysis 6 6 g 6 s of experiments 6 management 6 medicine & bio-medical research 6 6 estment risk 6 and insurance 6 ta analysis 6 ing 6 g 6 ics for investment 6 D Risk management and Basel II in banking and finance 6 s I 6
STAT1303 Data management 6 STAT1304 Design and analysis <b>2. Advanced level courses (2</b> 4 At least 24 credits of the followi STAT2301 Linear statistical and STAT2302 Statistical inference STAT2303 Probability modelling STAT2304 Design and analysis STAT2305 Quality control and 1 STAT2306 Business logistics 6 STAT2307 Statistical genetics 6 STAT2309 The statistics of inve STAT2310 Risk management a STAT2311 Computer-aided dat STAT2312 Data mining 6 STAT2313 Marketing engineeri STAT2314 Business forecasting STAT2315 Practical mathemati STAT2320 (note 1) / STAT3320 STAT23212 Financial economics STAT3301 Time-series analysis	6 s of sample surveys 6 4 credits) ing courses: alysis 6 6 g 6 s of experiments 6 management 6 medicine & bio-medical research 6 6 estment risk 6 and insurance 6 ta analysis 6 ing 6 g 6 ics for investment 6 D Risk management and Basel II in banking and finance 6 s 1 6
STAT1303 Data management ( STAT1304 Design and analysis <b>2. Advanced level courses (2</b> / At least 24 credits of the followi STAT2301 Linear statistical and STAT2302 Statistical inference STAT2303 Probability modelling STAT2304 Design and analysis STAT2305 Quality control and r STAT2306 Business logistics 6 STAT2307 Statistical genetics ( STAT2308 Statistical genetics ( STAT2309 The statistics of inve STAT2310 Risk management a STAT2310 Risk management a STAT2311 Computer-aided dat STAT2313 Marketing engineeri STAT2314 Business forecasting STAT2315 Practical mathemati STAT2320 (note 1) / STAT3320 STAT2302 Multivariate data an STAT3304 Computer-aided sta	6 s of sample surveys 6 4 credits) ing courses: alysis 6 6 g 6 s of experiments 6 management 6 immedicine & bio-medical research 6 6 estment risk 6 and insurance 6 ta analysis 6 ing 6 g 6 j
STAT1303 Data management ( STAT1304 Design and analysis <b>2. Advanced level courses (2</b> / At least 24 credits of the followi STAT2301 Linear statistical and STAT2302 Statistical inference STAT2303 Probability modelling STAT2304 Design and analysis STAT2305 Quality control and r STAT2306 Business logistics 6 STAT2307 Statistics in clinical r STAT2308 Statistical genetics 6 STAT2309 The statistics of inve STAT2309 The statistics of inve STAT2310 Risk management a STAT2311 Computer-aided dat STAT2312 Data mining 6 STAT2313 Marketing engineeri STAT2314 Business forecastin STAT2315 Practical mathemati STAT2312 Financial economics STAT3301 Time-series analysis STAT3302 Multivariate data an STAT3304 Computer-aided sta STAT3306 Selected topics in st	6 s of sample surveys 6 4 credits) ing courses: alysis 6 6 g 6 s of experiments 6 management 6 i medicine & bio-medical research 6 6 estment risk 6 and insurance 6 ta analysis 6 ting 6 g 6 ics for investment 6 D Risk management and Basel II in banking and finance 6 s 1 6 s 6 alysis 6 tistical modelling 6 tatistics 6
STAT1303 Data management 6 STAT1304 Design and analysis <b>2. Advanced level courses (2</b> 4 At least 24 credits of the followi STAT2301 Linear statistical and STAT2302 Statistical inference STAT2303 Probability modelling STAT2304 Design and analysis STAT2305 Quality control and r STAT2306 Business logistics 6 STAT2307 Statistics in clinical r STAT2308 Statistical genetics 6 STAT2309 The statistics of inve STAT2309 The statistics of inve STAT2310 Risk management a STAT2311 Computer-aided dat STAT2313 Marketing engineeri STAT2314 Business forecasting STAT2315 Practical mathemati STAT2315 Practical mathemati STAT2320 (note 1) / STAT3320 STAT2310 Time-series analysis STAT3301 Time-series analysis STAT3304 Computer-aided sta STAT3306 Selected topics in sta	6 s of sample surveys 6 4 credits) ing courses: alysis 6 6 9 9 6 9 9 6 9 9 6 1 1 1 1 1 1 1 1 1 1 1 1 1

STAT3322 Market risk analysis 6 STAT3811 Survival analysis 6 STAT3821 Financial economics II 6

#### Notes:

1 Not available in 2010-2011 or thereafter.

The following combinations of courses are recommended for students interested in more focused areas:

(a) Statistical theory and research methodology: STAT1301, STAT1302, STAT2301, STAT2302, STAT2303, STAT3301, STAT3302, STAT3316.

(b) Finance and investment: STAT1303, STAT2301, STAT2309, STAT2310, STAT2311, STAT2314, STAT2315, STAT2320, STAT2812, STAT3301, STAT3308, STAT3322, STAT3821.

(c) Business and management: STAT1303, STAT1304, STAT2301, STAT2305, STAT2306, STAT2311, STAT2312, STAT2313, STAT2314, STAT3302.

(d) Biological sciences: STAT1303, STAT2301, STAT2303, STAT2304, STAT2307, STAT2308, STAT2311, STAT3811.

(e) Information technology: STAT1303, STAT2311, STAT2312, STAT3304, STAT3317, STAT3322.

#### Remarks:

## **Replacement Courses for the same**

disciplinary courses appear in two or more Science Majors or Minors

# SCIENCE

### SECTION VII Replacement Courses for the same disciplinary courses appear in two or more Science Majors and Minors

The same disciplinary course may appear as required course in two or more Science majors or minors. Each course can only be used to satisfy the curriculum requirement of one major or one minor, even if that course appears in the curriculum of two majors or minors.

Students have to select another course to replace the course in the second major/minor and seek the written approval from the departmental course selection adviser offering the second major/minor by completing the form "Application for Taking a Replacement Course for the Course Required in Two Different Majors/Minors".

## Course Descriptions of BSc, Language,

## **Common Core Courses**

# SCIENCE

BIOC1001 Basic bio							Academic Year	2012	
Offering Department	Biochemistry						Quota	300	
Course Co-ordinator	Prof D K	(Y Shi	num, Biochem	istry					
Course Aim	aim to de students t	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	enzymes;	Structure and functions of carbohydrates, lipids, nucleic acids, amino acids and proteins; enzymes and co enzymes; basic bioenergetics; pH and ionic buffers in cellular environments; key metabolic processes in a living cell; separation and purification techniques in biochemistry; bioregulaotry mechanisms							
Learning Outcomes	<ul> <li>recogniz</li> <li>relate str</li> <li>explain t</li> <li>explain t</li> </ul>	nize the structu n the fu n the si	Il completion of the importance ures to functio functions of ke significance of basic princip	of pH and ic ons of biomo by metabolic biological re	onic buffers i lecules; processes; egulation;	n cellular env	ironments;	cules.	
Pre-requisites			n AL Biol or Al nts who have						
Offer in 2012 - 2013	1st sem						Examination	Dec	
Offer in 2013 - 2014	Y	Y							
Teaching Hours	24 lecture	res; tu	utorial may be	scheduled					
Assessment Method	One 2-ho	One 2-hour written final examination (70% weighting) and mid-term assessment (30% weighting)							
Course Grade	A+ to F								
Grade Descriptors	A Demonstrates thorough and complete mastery of the entire range of knowledge and analytical skills as required f attainment in all the course learning outcomes; excellence in critical thinking towards application of the knowledge in contexts.								
	B Demonstrates substantial command of a broad range of knowledge and analytical skills as required for attainment of the majority of course learning outcomes; good evidence of critical thinking towards application of the knowledge in a range of contexts.								
	C Demonstrates general but incomplete command of knowledge and analytical skills as required for attainment of adequate course learning outcomes; some evidence critical thinking towards application of the knowledge in a range of contexts.								
	D Demonstrates partial but limited command of knowledge and analytical skills as required for attainment of some of the course learning outcomes; limited evidence of critical thinking towards application of the knowledge in a range of contexts.								
	Fail Demonstrates little or no evidence of command of knowledge and analytical skills as required for attainment of the course learning outcomes; lacking in critical thinking towards application of the knowledge in a range of contexts.								
Textbooks	Nelson DI	Nelson DL, Cox MM (2008) Lehninger Principles of Biochemistry, 5th ed. W.H. Freeman, New York.							
References	Any other Biochemistry textbooks, e.g. Berg JM, Tymoczko JL, Stryer L (2007) Biochemistry, 6th ed. W.H. Freeman, New York.								

BIOC1003 Introduct	ion to mol	lecula	r genetics (6	6 credits)			Academic Year	2012
Offering Department	Biochemis	istry					Quota	150
Course Co-ordinator	Dr J D Hu	uang, B	iochemistry					
Course Aim	functions	of nucl	eic acids, to gi		eneral picture o		ate knowledge on process of gene of	
Course Contents	transcription translation regulation mutagene	tion on n of gen esis and	ucture and DN e expression d DNA repair of recombinar	·	ues and their a	application for	the isolation and	characterization
Learning Outcomes	<ul> <li>discuss t</li> <li>describe</li> <li>describe</li> <li>describe</li> </ul>	the role e the str e the pro e how D	e of DNA in ger ucture of DNA ocesses involv NA damages	netics; and chromosor ed in the inform are repaired;	nts should be a mes; ation flow from recombinant Dl	DNA to proteins	5;	
Pre-requisites	E or above	ve in AL	Biol/AL Chem	or AS Chem; o	r Pass in CHEM	10004 or CHEN	10008	
Offer in 2012 - 2013	2nd sem						Examination	Мау
Offer in 2013 - 2014	Y							
Teaching Hours	24 lecture	es and 6	6 tutorials					
Assessment Method	One 2-hou	our writte	en examinatior	n (80% weightin	g) and in class o	quiz (20% weigl	nting)	
Course Grade	A+ to F							
Grade Descriptors	A						nowledge in a wide rar inking when dealing wi	

	В	Displays a substantial and near-complete grasp of the subject and is able to apply the knowledge in a range of familiar and unfamiliar experimental contexts. Evidence of analytical and critical thinking when dealing with scientific data.
	С	Displays a general grasp of the subject and is sometimes able to apply the knowledge in a range of familiar and unfamiliar experimental contexts. Limited evidence of analytical and critical thinking when dealing with scientific data.
	D	Displays a limited grasp of the subject and is sometimes able to apply the knowledge in an experimental context. Poor analytical and critical thinking when dealing with scientific data.
	Fail	Displays an incorrect or incomplete grasp of the subject and is unable to apply the knowledge in an experimental context. Unable to analyse scientific data or think critically.
Textbooks	Berg JM,	Tymoczko JL, Stryer L (2007) Biochemistry, 6th ed. W.H. Freeman, New York.
	Nicholl DS	T (2008) An Introduction to Genetic Engineering, 3rd ed. Cambridge University Press, Cambridge.
	Zubay GL	(1998) Biochemistry, 3rd ed. Wm. C. Brown Publishers, Dubuque, Iowa.
References		c et al. (2000) Molecular Biology. The Instant Notes Series. BIOS, Oxford. Goldstein ES, Kilpatrick ST (2011) Lewin's Genes X. Jones and Bartlett, Mass.

BIOC2601 Metabolis	m (6 credit	5)			Academic Year	2012
Offering Department	Biochemist	у			Quota	60
Course Co-ordinator	Dr N S Wo	g, Biochemistry				
Course Aim	survival of	aims to provide the basic iving organisms. Taken t ced courses offered in the	c concepts of metabolism: to ogether with BIOC1001 and Biochemistry discipline.	the events an d BIOC2602	d their importance , this will lay the fo	in relation to the oundation for the
Course Contents	organisms. breakdown also be co	Major metabolic pathways of glucose, glycogen, triac isidered. Emphasis is on	metabolic pathways involv s covered in this course inc cylglycerol, and amino acids the understanding of the cues. Metabolic derangeme	lude those th s. The metab metabolic rea	at are involved in t olism of purines ar actions involved a	he synthesis and d pyrimidines wil nd how they are
Learning Outcomes	<ul> <li>explain th</li> <li>recognize</li> <li>discuss th</li> </ul>	e significance of individual the importance and the ne e roles of enzymes in the r	se, students should be able steps in a metabolic pathwa ed for regulation of metabo regulation of metabolic path integrated under different p	ay; lic pathways; ways;	ind pathological co	nditions.
Pre-requisites	Pass in BIC	C1001 or BIOL1125				
Offer in 2012 - 2013	1st sem				Examination	Dec
Offer in 2013 - 2014	Y					
Teaching Hours	24 lectures	and 6 tutorials				
Assessment Method	One 2-hou	written examination (80%	weighting) and coursework	(20% weighti	ng)	
Course Grade	A+ to F					
Grade Descriptors	A	strong analytical ability and logi	tensive knowledge and skills requi cal thinking and is able to apply ki ted ideas confidently and clearly.			
	В		ledge and skills required for attaini nking and is sometimes able to a			
	С		nplete knowledge and skills requir ility and logical thinking and is son icates ideas clearly.			
	D		e and skills required for attaining s s rarely able to apply knowledge to			
	Fail		ice of knowledge and skills require s unable to apply knowledge to sol			
References	Berg JM, T	moczko JL, Stryer L (2007	7) Biochemistry, 6th ed. W.H	H. Freeman, N	lew York.	
	Devlin TM	2006) Textbook of Biocher	mistry: with Clinical Correlat	ions, 6th ed.	Wiley-Liss, Hoboke	n, New Jersey.
		Cox MM (2008) Lehninger				

BIOC2602 Understa	nding metabolic diseases (6 credits)	Academic Year	2012
Offering Department	Biochemistry	Quota	40
Course Co-ordinator	Dr L Y L Cheng, Biochemistry		
Course Aim	To strengthen students' understanding of metabolism. By using a proble students are trained in critical thinking and problem-solving skills. Students on metabolic integration and control and they can use these concepts with approaching new problems and new areas of study.	will be able to grasp	the major effects
Course Contents	Knowledge of major pathways is applied to the understanding of disease mer will be delivered in the form of lectures, case presentations, etc. and sup illustrate the major concepts of metabolic diseases. The second half of the format in which students are given cases to analyse and search for solu	plemented with auc course will be delive	dio-visual aids to /ered in a tutorial
	000		

	disturbar	ces which lead to diseases wil	I be discussed.					
Learning Outcomes	<ul> <li>apply the</li> <li>disease in</li> <li>illustrate</li> <li>metabolic</li> <li>explain</li> </ul>	ssful completion of this course howledge of major metabol echanisms; the major concepts of metabol disturbances in diseases; he importance of metabolic in critical thinking, problem-solvi	ic pathways to the understanding plic diseases and discuss the tegration and control;	g of				
Pre-requisites		BIOC1001 or BIOL1125 or BIO BIOC2601, or already enrolled						
Offer in 2012 - 2013	2nd sem			Examination	Мау			
Offer in 2013 - 2014	Y							
Teaching Hours	18 x 1-ho	ur lectures plus 4 x 3-hour PBI	L tutorials					
Assessment Method	One 2-ho	ur written examination (50% w	eighting) plus continuous assess	sment in tutorials (50% v	veighting)			
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 in the critique of scientific data and is able to apply knowledge to a wide range of complex situations. Presents ideas clearly and coherently and collaborates proactively with peers.							
	в	B 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	evidence of some analytical ability	lete knowledge and skills required for at y and logical thinking in the critique of so presenting ideas coherently and collabo	cientific data and is sometimes				
	D	analytical ability and logical thinki	nowledge and skills required for attaining ing in the critique of scientific data and as and reluctantly collaborates with peers	is rarely able to apply knowled				
	Fail		ce of knowledge and skills required fo king in the critique of scientific data an unable to collaborate with others.					
Textbooks	None pre	scribed						

BIOC2603 Principle		5		Academic Year	
Offering Department	Biochemistry			Quota	60
Course Co-ordinator	Dr M H Sham,	Biochemistry			
Course Aim	approaches a	sic knowledge on molecular genetics, ad computer-assisted programmes. Toge molecular genetics is provided for advance	ether with BIOC3613	and BIOC3609,	a comprehensive
Course Contents	RNA processir Introns & exon Genetic engine DNA polymorp	bination and transposition. g. s. ering and applications.			
Learning Outcomes	- illustrate the i	completion of this course, students should nechanisms of prokaryotic gene expressic ryotic RNA processing, intron splicing and	on controls using bact		nples;
	<ul> <li>describe the l</li> <li>apply their u mapping;</li> </ul>	pasic principles of DNA recombination and inderstanding of sequence variations and ic knowledge on transcription, translation	the mechanisms of t polymorphisms in th	ransposition; ne human genome	0
Pre-requisites	<ul> <li>describe the l</li> <li>apply their u</li> <li>mapping;</li> <li>integrate bas</li> <li>on genetic eng</li> </ul>	pasic principles of DNA recombination and inderstanding of sequence variations and ic knowledge on transcription, translation	the mechanisms of t polymorphisms in th and control of gene of	ransposition; le human genome expression and ap	0
•	<ul> <li>describe the l</li> <li>apply their u</li> <li>mapping;</li> <li>integrate bas</li> <li>on genetic eng</li> </ul>	pasic principles of DNA recombination and inderstanding of sequence variations and ic knowledge on transcription, translation ineering.	the mechanisms of t polymorphisms in th and control of gene of	ransposition; le human genome expression and ap	0
Offer in 2012 - 2013	<ul> <li>describe the l</li> <li>apply their u</li> <li>mapping;</li> <li>integrate bas</li> <li>on genetic eng</li> <li>Pass in BIOC1</li> </ul>	pasic principles of DNA recombination and inderstanding of sequence variations and ic knowledge on transcription, translation ineering.	the mechanisms of t polymorphisms in th and control of gene of	ransposition; he human genome expression and ap IOL1106	ply the knowledg
Offer in 2012 - 2013 Offer in 2013 - 2014	<ul> <li>- describe the l</li> <li>- apply their u</li> <li>mapping;</li> <li>- integrate bas</li> <li>on genetic eng</li> <li>Pass in BIOC1</li> <li>1st sem</li> <li>Y</li> </ul>	pasic principles of DNA recombination and inderstanding of sequence variations and ic knowledge on transcription, translation ineering.	the mechanisms of t polymorphisms in th and control of gene of	ransposition; he human genome expression and ap IOL1106	ply the knowledg
Offer in 2012 - 2013 Offer in 2013 - 2014 Teaching Hours	<ul> <li>- describe the l - apply their u mapping;</li> <li>- integrate bas on genetic eng</li> <li>Pass in BIOC1</li> <li>1st sem</li> <li>Y</li> <li>24 lectures; tut</li> </ul>	pasic principles of DNA recombination and inderstanding of sequence variations and ic knowledge on transcription, translation ineering. 001 or BIOC1003 or BIOL1102 or BIOL11	the mechanisms of t polymorphisms in th and control of gene of 22 or BIOL1125 or BI	ransposition; le human genome expression and ap IOL1106 Examination	ply the knowledg
Offer in 2012 - 2013 Offer in 2013 - 2014 Teaching Hours Assessment Method	<ul> <li>- describe the l - apply their u mapping;</li> <li>- integrate bas on genetic eng</li> <li>Pass in BIOC1</li> <li>1st sem</li> <li>Y</li> <li>24 lectures; tut</li> </ul>	pasic principles of DNA recombination and inderstanding of sequence variations and ic knowledge on transcription, translation ineering. 001 or BIOC1003 or BIOL1102 or BIOL11 001 ar BIOC1003 or BIOL1102 or BIOL11	the mechanisms of t polymorphisms in th and control of gene of 22 or BIOL1125 or BI	ransposition; le human genome expression and ap IOL1106 Examination	ply the knowledg
Offer in 2012 - 2013 Offer in 2013 - 2014 Teaching Hours Assessment Method Course Grade	<ul> <li>- describe the l - apply their u mapping;</li> <li>- integrate bas on genetic eng</li> <li>Pass in BIOC1</li> <li>1st sem</li> <li>Y</li> <li>24 lectures; tut</li> <li>One 2-hour wr</li> <li>A+ to F</li> </ul>	pasic principles of DNA recombination and inderstanding of sequence variations and ic knowledge on transcription, translation ineering. 001 or BIOC1003 or BIOL1102 or BIOL11 001 ar BIOC1003 or BIOL1102 or BIOL11	the mechanisms of t polymorphisms in th and control of gene of 22 or BIOL1125 or BI ursework (20% weight d skills required for attaining ue of scientific data and is	ransposition; te human genome expression and ap IOL1106 <b>Examination</b> ing)	ply the knowledg
Offer in 2012 - 2013 Offer in 2013 - 2014 Teaching Hours Assessment Method Course Grade	- describe the l - apply their u mapping; - integrate bas on genetic eng Pass in BIOC1 1st sem Y 24 lectures; tut One 2-hour wr A+ to F A De str co B an	pasic principles of DNA recombination and inderstanding of sequence variations and ic knowledge on transcription, translation ineering. 001 or BIOC1003 or BIOL1102 or BIOL11 001 or BIOC1003 or BIOL1102 or BIOL11 then examination (80% weighting) and cou	the mechanisms of t polymorphisms in th and control of gene of 22 or BIOL1125 or BI ursework (20% weight d skills required for attaining use of scientific data and is thy, with confidence.	ransposition; le human genome expression and ap IOL1106 Examination ing) Ing all the course learn s able to apply knowled course learning outcome	Dec
Pre-requisites Offer in 2012 - 2013 Offer in 2013 - 2014 Teaching Hours Assessment Method Course Grade Grade Descriptors	- describe the l - apply their u mapping; - integrate bas on genetic eng Pass in BIOC1 1st sem Y 24 lectures; tut One 2-hour wr A+ to F A De B De B De C ev	pasic principles of DNA recombination and inderstanding of sequence variations and ic knowledge on transcription, translation ineering. 001 or BIOC1003 or BIOL1102 or BIOL11 orial may be scheduled tten examination (80% weighting) and cou monstrates thorough and extensive knowledge and ong analytical ability and logical thinking in the critiq nplex situations. Presents ideas clearly and coheren monstrates substantial knowledge and skills required aytical ability and logical thinking in the critique of s	the mechanisms of t polymorphisms in th and control of gene of 22 or BIOL1125 or BI ursework (20% weight d skills required for attaining tue of scientific data and is tity, with confidence. d for attaining most of the c scientific data and is often scientific data and is often	ransposition; le human genome expression and ap IOL1106 Examination ing) Ing all the course learn s able to apply knowled most of the course learn	ply the knowledg Dec ing outcomes. Shows lge to a wide range of es. Shows evidence of ge to a wide range of ning outcomes. Show

	D	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.
	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 when presenting ideas.
Textbooks	Nicholl DST	(2008) An introduction to Genetic Engineering, 3rd ed. Cambridge University Press, Cambridge.
	Watson JD	et al. (2008) Molecular Biology of the Gene, 6th ed. Pearson/Benjamin Cummings, San Francisco.
References	Griffiths AJI	F et al. (2008) Introduction to Genetic Analysis, 9th ed. W.H. Freeman and Co., New York.
	Weaver RF	(2008) Molecular Biology, 4th ed. McGraw-Hill, Boston.

BIOC2604 Essential credits)	technique	es in biochemis	try and molecula	r biology (6	Academic Year	2012			
Offering Department	Biochemis	stry			Quota	60			
Course Co-ordinator	Dr K M Ya	o, Biochemistry							
Course Aim	0	U U		t experimental appro emical and molecular	aches and model system techniques.	ns, and to provide			
Course Contents	molecular acids; sub	, genomic and othe cellular fractionation	ers; methods for isol on; enzyme assays	ation and analysis of and spectrophotomet	rimental approaches - ge carbohydrates, proteins, try; basic nucleic acid ma , restriction mapping.	lipids and nucleic			
Learning Outcomes	<ul> <li>understa</li> <li>describe</li> <li>apply dif</li> </ul>	nd the basic princip different experime ferent techniques to		emical and molecular ichieving defined exp plecular analyses;					
Pre-requisites	Pass in Bl	OC1001 or BIOC1	003 or BIOL1102 or	BIOL1122 or BIOL112	25 or BIOL1106 or MEDE	0001			
Offer in 2012 - 2013	2nd sem				Examination	Мау			
Offer in 2013 - 2014	Y								
Teaching Hours	12 x 1 hou	ır lectures; 12 x 5 h	our practicals with p	re-lab and post-lab dis	scussions				
Assessment Method	One 2.5-h	our written examina	ation (50% weighting	) plus course work an	nd lab report assessment	(50% weighting)			
Course Grade	A+ to F								
Grade Descriptors	A	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.							
	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	some evidence of c	ritical thinking and analy		ratory skills and techniques to	g most of the course learning outcomes. Shows skills and techniques to a satisfactory level of conclusions.			
	D		ig and analytical skills. Dis		ining some of the course learn s and techniques and is rarely a				
	Fail				taining the course learning outc ues and is unable to use data				
Textbooks	Scopes R Verlag, Ne		Purification: Principles	s and Practice. Sprin	ger Advanced Texts in C	hemistry, Springer			
		Walker KM (200 Press, Cambridge		echniques of Bioche	mistry and Molecular Bi	ology. Cambridge			
	Watson JI	D (1992) Recombin	ant DNA. Scientific A	merican Books, New	York.				
References	Alberts B	et al (2007) Molecu	lar Biology of the Ce	II, 5th ed. Garland Sc	ience. New York.				

BIOC2616 Directed s	tudies in biochemistry (6 credits)	Academic Year	2012
Offering Department	Biochemistry	Quota	45
Course Co-ordinator	Dr J D Huang, Biochemistry		
Course Aim	To enhance students knowledge of a particular topic and the students self-skills.	directed learning an	d critical thinking
Course Contents	The student undertakes a self-managed study on a topic in biochemistic member. The topic is preferably one not sufficiently covered in the regular c a critical review or a synthesis of published work on the subject. A laboratory student's understanding of the subject may also be involved.	urriculum. The direct	cted study can be
Learning Outcomes	On successful completion of this course, students should be able to:		

	- examine	e the theore	esearch literature in a s tical or experimental ba nd evaluate issues for f	isis for existing conce	epts;	blecular biology;	
Pre-requisites			chemistry major studer have passed in BIOC3		enrolled in th	is course.	
Offer in 2012 - 2013	1st sem	2nd sem	Summer			Examination	No Exam
Offer in 2013 - 2014	Y						
Teaching Hours		on meetings on the proje	to be arranged by the ect.	student and the sup	ervisor. The s	tudent is expecte	ed to spend at least
Assessment Method			eighting) in the form of ent (30% weighting); O				es and references);
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	contextua the study. the finding	a coherent appraisal of the ize many of the ideas within Works constructively with a is to a broader audience and wn learning.	a personal framework of supervisor to enhance und	knowledge and i derstanding and s	dentify some relevan scientific writing skills	t issues emerging from Clearly communicates
	с	Able to co relevant is scientific	a reasonable appraisal of the ntextualize a few of the idea ssues emerging from the st writing skills. Communicates Acceptable time-manageme	s within a personal framew udy. Works with a super the findings to a broad	work of knowledg rvisor and other er audience with	e and makes some a co-workers to impro	ittempt to identify some understanding and
	D	contextua from the s	a superficial appraisal of the ize a few of the ideas within tudy. Works reluctantly with weak communication skills v skills.	a personal framework of k a supervisor and other co-	workers to develo	able to identify any re	levant issues emerging d scientific writing skills.
	Fail	contextua Works in	opraise the biochemical liter ize the ideas within a perso isolation, thus failing to may when presenting the findings	nal framework of knowled ake progress in understa	dge or identify an Inding and scien	y relevant issues en tific writing skills. U	nerging from the study. nable to communicate

Offering Department	Biochemis	istry						Quota		60
Course Co-ordinator	Dr B C W	/ Wong,	Biochemistry							
Course Aim	principles	s of thes	e analysis pro	ograms and	d services	will be pre	esented. Stud	in sequence analy ents will learn how le on the World Wi	to re	etrieve, analyze
Course Contents	DNA and SRS; Sin substitutio	l protein mple se on matri	equence anal	itabase, pr ysis; sequ ce databas	rotein fami uence alig se searchir	ly databas Inment: p ng: algoritl	air-wise aligr	n searching and re ment, multiple se neters; sequence p	quer	nce alignment
Learning Outcomes	<ul> <li>search a</li> <li>describe</li> <li>perform</li> <li>interpret</li> </ul>	and retri e the alg sequen t results		e informatio arwise and sing EMBO ce alignmen	on from bic I multiple a DSS packa nts and BL	logical dat lignments ge and oth AST datal	abases; BLAST searc er web-basec base searches		c tree	es constructior
Pre-requisites	Pass in B	3IOC260	3 or BIOL230	3 or BIOL3	3308 or ME	DE0001				
•	Pass in B 2nd sem	3IOC260	3 or BIOL230	3 or BIOL3	3308 or ME	DE0001		Examination		Мау
Offer in 2012 - 2013		3IOC260	3 or BIOL230	3 or BIOL3	3308 or ME	DE0001		Examination		Мау
Offer in 2012 - 2013 Offer in 2013 - 2014	2nd sem Y		3 or BIOL230 torials may be			EDE0001		Examination		Мау
Offer in 2012 - 2013 Offer in 2013 - 2014 Teaching Hours	2nd sem Y 24 lecture	es; 12 tu		e scheduleo	d		ork (30% weig			Мау
Offer in 2012 - 2013 Offer in 2013 - 2014 Teaching Hours Assessment Method	2nd sem Y 24 lecture	es; 12 tu	torials may be	e scheduleo	d		ork (30% wei			Мау
Offer in 2012 - 2013 Offer in 2013 - 2014 Teaching Hours Assessment Method Course Grade	2nd sem Y 24 lecture One 2-hor	es; 12 tu our writte Demo	torials may be n examination	e scheduler n (70% wei n and comple	d ighting) an ete mastery a	d coursew	d level of extensi		requi	red for attaining a
Offer in 2012 - 2013 Offer in 2013 - 2014 Teaching Hours Assessment Method Course Grade	2nd sem Y 24 lecture One 2-hou A+ to F	es; 12 tu bur writte Demo the co Demo	torials may be on examination instrates thoroug surse learning out	e scheduler n (70% wei n and comple comes; stron- tial command	d ighting) an ete mastery a ng critical thin d of a broad r	d coursew t an advance king; exceller ange of knov	d level of extensi at ability to apply vledge and skills	ghting) ve knowledge and skills	requi range least i	ired for attaining a e of context.
Offer in 2012 - 2013 Offer in 2013 - 2014 Teaching Hours Assessment Method Course Grade	2nd sem     Y     24 lecture     One 2-hor     A+ to F	es; 12 tu pur writte Demo the co Demo learnin Demo	torials may be en examination instrates thoroug iurse learning out instrates substan ing outcomes; evi instrates general	e scheduled h (70% wei h and comple cornes; stron- tial command dence of critic but incomple	d ighting) an ete mastery a g critical thin d of a broad r cal thinking; g ete command	d coursew t an advance king; exceller ange of know good ability to d of knowled	d level of extensi tt ability to apply vledge and skills apply bioinforma ge and skills rec	ghting) ve knowledge and skills bioinformatics skills in a required for attaining at	requi range least i	ired for attaining a e of context. most of the cours tt.
Pre-requisites Offer in 2012 - 2013 Offer in 2013 - 2014 Teaching Hours Assessment Method Course Grade Grade Descriptors	2nd sem Y 24 lecture One 2-hou A+ to F A B	es; 12 tu pur writter Demo becc Demo learnin Demo outcol Demo	torials may be en examination instrates thoroug jurse learning our instrates substan ng outcomes; evi instrates general me; some critical instrates partial	e scheduled n (70% wei n and comple comes; stron- tial command dence of critic but incomple thinking; ade but limited c	d ighting) an g critical thin d of a broad r cal thinking; g ete command equate ability command of	d coursew t an advance king; exceller ange of know good ability to d of knowled to apply bioir knowledge	d level of extensi at ability to apply vledge and skills apply bioinforma ge and skills red formatics skills ir and skills requir	phting) ve knowledge and skills bioinformatics skills in a required for attaining at tics skills in a range of o uired for attaining mos	requi range least i contex	ired for attaining a e of context. most of the cours tt. ne course learning

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.

BIOC3609 Molecular	r medicine	ne (6 d	credits)						Academic Year	2012
Offering Department	Biochemis	nistry							Quota	50
Course Co-ordinator	Dr D Y Jin	Dr D Y Jin, Biochemistry								
Course Aim		ig the							n diseases includii logical, pharmaceu	
Course Contents	basis of ca human dis genes, mo genes, gen vaccine de	cance diseas nolecu genom develo	er and viral ses, multifac ular basis of ne instability opment, ster	diseases, a torial diso genetic di HIV scien n cells, ger	and mole rders, lin seases, r ice, gene ne therap	cular thei kage and mouse m tics and p y, and nu	apeutics.	Specific topic on, position nan disease sis of influen herapeutics.	uman molecular g cs may include ge al cloning, identifi s, oncogenes and za viruses, molecu ore taking this cour	netic variation a cation of disea tumor suppres llar approaches
Learning Outcomes	<ul> <li>describe</li> <li>explain the</li> <li>illustrate</li> </ul>	be the in the m te the a ate and		enetic princ chanisms of molecula	ciples und underlyin ar biology	derlying h g cancers in medic	uman gen and viral ne with ex	etic diseases diseases amples;	; roaches in diseas	e prevention a
Pre-requisites	Pass in Bl	BIOC2	2603 or BIO	_2303						
Offer in 2012 - 2013	2nd sem	ı							Examination	May
Offer in 2013 - 2014	Y									
Teaching Hours	24 lectures	res; tut	utorials may l	be schedul	ed					
Assessment Method	One 3-hou	our ex	xamination (8	30% weigh	ting) plus	a class t	est (20% v	eighting)		
Course Grade	A+ to F									
Grade Descriptors	A Displays a comprehensive grasp of the key concepts underlying the molecular basis of human disease and is able to articulate clearly how this knowledge can lead to effective treatment strategies. Evidence of strong analytical and critical thinking when dealing with complex scientific data.									
	B Displays a substantial and near-complete grasp of the key concepts underlying the molecular basis of human disease and is able to relate this knowledge to effective treatment strategies. Able to apply analytical and critical thinking skills when dealing with scientific data.									
	C Displays a general understanding of the key concepts underlying the molecular basis of human disease and is sometimes able to relate this knowledge to effective treatment strategies. Sometimes able to apply analytical and critical thinking skills when dealing with scientific data.									
	Displays a limited understanding of the key concepts underlying the molecular basis of human disease and is rarely able to relate this knowledge to effective treatment strategies. Evidence of weak analytical and critical thinking skills when dealing with scientific data.									
	Fail Displays an incorrect or incomplete understanding of the key concepts underlying the molecular basis of human disease and is unable to relate this knowledge to effective treatment strategies. No evidence of analytical or critical thinking skills when dealing with scientific data.									
Textbooks	Strachan T	n T, Re	ead AP (200	4) Human	Molecula	ar Genetic	s 3. Garla	nd Science, I	London.	
	Vogelstein	ein B, ł	Kinzler K (ed	d.) (2002) T	The Gene	etic Basis	of Human	Cancer, 2nd	ed. McGraw-Hill, I	New York.
	Knipe DM Philadelph		owley PM (e	d.) (2007)	Fields Vi	rology, 51	h ed. Wol	ters Kluwer	Health/Lippincott V	Villiams & Wilki

BIOC3610 Advanced	l biochemistry I (6 credits)	Academic Year	2012			
Offering Department	Biochemistry	Biochemistry Quota 50				
Course Co-ordinator	Dr K M Yao, Biochemistry					
Course Aim	This course aims at providing students an in-depth understanding of funda biochemistry. This course is particularly useful for students interested in res in biomedical sciences.					
Course Contents	Topics covered include inter- and intracellular signal transduction mechanisms, mechanisms and significance of post-translational modifications of proteins, and the forms and functions of complex carbohydrates.					
Learning Outcomes	On successful completion of this course, students should be able to: - describe the molecular and cellular signal transduction mechanisms and ir - illustrate the controls of the metabolic and cellular regulation based of translational modification mechanisms; - develop critical thinking and analytical skills.		g of co- and post			
Pre-requisites	Pass in (BIOC1001 and BIOL2301 and (BIOC2601 or BIOL2115))					
Offer in 2012 - 2013	1st sem Examination Dec					
Offer in 2013 - 2014	Υ					

Teaching Hours	Lectures	Lectures: 24 hours; tutorials may be scheduled					
Assessment Method		One 3-hour written examination (70% weighting) and continuous assessment based on written assignments (30% weighting)					
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; shows 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	Demonstrates substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes; shows evidence of critical thinking and analytical skills and ability to apply knowledge to familiar and some unfamiliar situations.					
	С	Demonstrates substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes; shows evidence of critical thinking and analytical skills and ability to apply knowledge to familiar and some unfamiliar situations.					
	D	Demonstrates 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 and shows limited ability to apply knowledge to solve problems.					
	Fail	Demonstrates little or no evidence of command of knowledge and skills required for attaining the course learning outcomes; lack of critical thinking and analytical skills and no ability to apply knowledge to solve problems.					
Textbooks		H et al (2008) Molecular Cell Biology, 6th ed. Freeman, New York. B et al (2010) Essential Cell Biology, 3rd ed. Garland Science, New York.					
References	None pr	escribed					

BIOC3611 Advanced	d biochemi	istry II (6 credits)	Academic Year	2012				
Offering Department	Biochemis	try	Quota	50				
Course Co-ordinator	Dr D Chan	D Chan, Biochemistry						
Course Aim	structure a	e is aim at providing students with an up-to-date knowledg and disease; realizing the importance of kinetics in cell cal advances in the characterization of macromolecules.						
Course Contents	changes ir characteriz	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.						
Learning Outcomes	- describe - recognize - derive str	ssful completion of this course, students should be able to: how protein structures inform functions; e the roles of enzyme kinetics in cellular functions; ructural information of macromolecules from experimental da ir knowledge on protein engineering and therapeutics, and c		basic and applied				
Pre-requisites		OC2601 and BIOL2301; and OC3610, or already enrolled in this course.						
Offer in 2012 - 2013	2nd sem		Examination	Мау				
Offer in 2013 - 2014	Y							
Teaching Hours	Lectures: 2	24 hours: tutorials may be scheduled						
Assessment Method	One 3-hou weighting)	ur written examination (70% weighting) and continuous asse	ssment based on written	assignments (30%				
Course Grade	A+ to F							
Grade Descriptors	A Clear and insightful description of how protein structure informs function; clear evidence of ability to recognize mechanisms of enzyme function and interpretation of data; effectual demonstration of applying knowledge to the design of scientific methodologies and cohesive, systematic and creative organization of information for presentation and communication.							
	B Clear description of how protein structure informs function; evidence of ability to recognize mechanisms of 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.							
	C 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 Lack of awareness of how protein structure informs function; lack of ability to recognize mechanisms of e interpretation of data; superficial demonstration of applying knowledge to the design of scientific method organizational skill of information for presentation and communication.								
Textbooks	W.H. Free	Fersht A (1999) Structure and Mechanism in Protein Science: A Guide to Enzyme Catalysis and Protein Folding W.H. Freeman, New York. Miller AD & Tanner JA (2008) Essentials of Chemical Biology: Structure and Dynamics of Biological Macromolecules, John Wiley & Sons, Chichester, England: Hoboken, N.I.						
	Macromole	ecules. John Wiley & Sons, Chichester, England; Hoboken, N						

BIOC3613 Molecular biology of the gene (6 credits)	Academic Year	2012

Biochemist	ry	Quota	50					
Prof K S E	rof K S E Cheah, Biochemistry							
	o provide an up-to-date knowledge of molecular biology, especially with respect to the regulation of eukaryotic							
function. T	hrough this course, an understanding of how gene expressio							
<ul> <li>describe t</li> <li>explain he</li> <li>levels;</li> <li>illustrate t</li> </ul>	describe the mechanisms for regulation of transcription, RNA processing and translation in eukaryotes; explain how cellular homeostasis can be maintained by a combination of controls of gene expression at multiple vels; Ilustrate the hierachy of gene expression regulation in multicellular developmental processes;							
Pass in BIC	0C2603 or BIOL2303 or BIOL3308							
2nd sem		Examination	May					
Y								
24 lectures	; tutorial may be scheduled							
One 3-hou	written examination (80% weighting) plus written assignmen	ts (20% weighting)						
A+ to F								
A	A Demonstrates a deep and comprehensive understanding of the regulation of eukaryotic gene expression and its relevance t disease and effectively relates the knowledge to multicellular developmental processes. Uses skill and insight to analyse an interpret experimental data from gene regulation studies.							
в	Demonstrates a competent grasp of the key concepts in the regulation of eukaryotic gene expression and its relevance disease and is able to link the knowledge to multicellular developmental processes. Correctly analyses and interpr experimental data from gene regulation studies.							
C 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.								
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.								
Alberts B e	t al. (2007) Molecular Biology of the Cell, 5th ed. Garland Sci	ence, New York.						
Lewin B (20	008) Genes IX. Jones and Bartlett Publishers, Sudbury, Mass	5.						
	,		о <del>г</del>					
	<ul> <li>Prof K S E</li> <li>To provide gene expression</li> <li>This is a function. Trand post transformation of the second sec</li></ul>	gene expression and molecular embryology.         This is a comprehensive course covering many detailed molecula function. Through this course, an understanding of how gene expressio and post transcription will be gained.         On successful completion of this course, students should be able to: <ul> <li>describe the mechanisms for regulation of transcription, RNA processis</li> <li>explain how cellular homeostasis can be maintained by a combination levels;</li> <li>illustrate the hierachy of gene expression regulation in multicellular development experimental results in gene regulation studies.               Pass in BIOC2603 or BIOL2303 or BIOL3308               2nd sem               Y               24 lectures; tutorial may be scheduled               One 3-hour written examination (80% weighting) plus written assignment A+ to F               A             Demonstrates a deep and comprehensive understanding of the regulation disease and effectively relates the knowledge to multicellular development interpret experimental data from gene regulation studies.               B             Demonstrates a competent grasp of the key concepts in the regulation disease and is able to link the knowledge to multicellular development interpret experimental data from gene regulation studies.               C             Demonstrates a basic understanding of the regulation of eukaryotic ge sometimes able to relate the knowledge to multicellular developmental processes. Displays weak analytical skills ar gene regulation studies.               D             Demonstra</li></ul>	Prof K S E Cheah, Biochemistry         To provide an up-to-date knowledge of molecular biology, especially with respect to the regigene expression and molecular embryology.         This is a comprehensive course covering many detailed molecular aspects of gene refunction. Through this course, an understanding of how gene expression can be regulated at lead post transcription will be gained.         On successful completion of this course, students should be able to: <ul> <li>explain how cellular homeostasis can be maintained by a combination of controls of gene expression regulation in multicellular developmental processes</li> <li>interpret experimental results in gene regulation studies.</li> </ul> Pass in BIOC2603 or BIOL2303 or BIOL3308       Examination         Y       24 lectures; tutorial may be scheduled         One 3-hour written examination (80% weighting) plus written assignments (20% weighting)         A to F       Demonstrates a deep and comprehensive understanding of the regulation of eukaryotic gene express disease and effectively relates the knowledge to multicellular developmental processes. Uses skill an interpret experimental data from gene regulation studies.         B       Demonstrates a deep and comprehensive understanding of the regulation of eukaryotic gene express disease and is able to link the knowledge to multicellular developmental processes. Uses skill an interpret experimental data from gene regulation studies.         B       Demonstrates a basic understanding of the regulation of eukaryotic gene express disease and is able to link the knowledge to multicellular developmental processes. Correctly a experimental data fr					

BIOC3614 Biochemi	stry project (12 credits)	Academic Year	2012
Offering Department	Biochemistry	Quota	15
Course Co-ordinator	Dr N S Wong, Biochemistry		
Course Aim	To enable students to acquire the basic skills in scientific communication, teamwork and time management. The course is to pursue a career in life science.		
Course Contents	Project-related topics in biochemistry, cell and molecular biology. Experimental methods in protein and nucleic acid biochemistry; b Critical appraisal of current science literature Formulation of research questions Design of experiments. Data analysis and interpretation. Scientific writing		
Learning Outcomes	On successful completion of this course, students should be able - describe recent research development in a defined area of bioc - formulate research questions and design experiments to addres - apply appropriate experimental techniques to solve research pro- manage and interpret experimental results; - develop scientific writing skills and logically report their research	hemistry and molecular biology as these questions; oblems;	;
Pre-requisites	Pass in BIOC1001 and BIOC2604; and Pass in BIOC3610, or already enrolled in this course; and Pass in BIOC3611, or already enrolled in this course; and Pass in BIOC3615, or already enrolled in this course; and Not for students who have passed in BIOC2616, or have already	enrolled in this course.	
Offer in 2012 - 2013	Year long	Examination	No Exam
Offer in 2013 - 2014	Y		
Teaching Hours	By actively participating in a research project in molecular life science	ences, under the supervision of	an academic st
Assessment Method	Dissertation (60% weighting). Continuous assessment (15% weighting) dissertation must be submitted on the date as specified in the exigiven in early June.		

Course Grade	A+ to F					
Grade Descriptors	A	Plans and executes a sophisticated and imaginative experimental investigation, framing the research question within existing knowledge. Displays tenacity and commitment, generating a meaningful body of data that is analysed with insight and comprehensively evaluated in the context of the original research question. Works proactively with a supervisor and other co-workers to enhance practical and scientific writing skills. Communicates the findings to a broader audience in an effective way and responds knowledgeably to questions. Excellent time-management skills.				
	В	Plans and executes a detailed experimental investigation, framing the research question within existing knowledge. Works with commitment, generating a sufficient body of data that is analysed and evaluated in the context of the original research question with skill and understanding. Works constructively with a supervisor and other co-workers to enhance practical and scientific writing skills. Clearly communicates the findings to a broader audience and responds knowledgeably to most questions. Able to time-manage effectively.				
	С	Plans and executes an experimental investigation, attempting to contextualize the research question. Works with adequate commitment in order to generate sufficient data for a reasonable analysis and evaluation in the context of the original research question. Works with a supervisor and other co-workers to improve practical and scientific writing skills. Communicates the findings to a broader audience with reasonable clarity and responds to most questions. Acceptable time-management skills.				
	D	Plans and executes a rudimentary experimental investigation, showing a limited ability to contextualize the research question. Displays minimal commitment when collecting data and is only able to undertake a superficial analysis and evaluation. Works reluctantly with a supervisor and other co-workers to develop practical and scientific writing skills. Displays weak communication skills when presenting the findings to a broader audience. Poor time-management skills.				
	Fail	Plans and executes a flawed or simplistic experimental investigation, which lacks a valid scientific context. Shows no commitment when collecting data and produces an incoherent analysis and evaluation. Works in isolation, thus failing to improve practical and scientific writing skills. Displays weak communication skills when presenting the findings to a broader audience. No time-management skills.				
Textbooks	None pr	escribed				

BIOC3615 Advance credits)	d techniqu	ues in bio	ochemistry & n	nolecular bio	logy (6		Academic Year	2012
Offering Department	Biochemis	nistry					Quota	50
Course Co-ordinator	Dr D Chai	an, Biocher	nistry					
Course Aim	aim is to	provide th		ing for students	to pursue posto			d disciplines. The n and for potential
Course Contents		natics. Stud					olecular and ce es with modern in	ell biology, and struments used in
Learning Outcomes	<ul> <li>explain</li> <li>biology;</li> <li>apply an</li> <li>critically</li> <li>design a</li> </ul>	n the basic and perform y evaluate o alternative	bletion of this cour principles of cur these techniques experimental data approaches to tes perimental report	rrent advanced in other novel e ; st or validate hyperters	techniques cor experimental set potheses;	tings;	sed in biochemist itures.	ry and molecular
Pre-requisites	Pass in (E	(BIOC1001	and (BIOC0002 o	or BIOC1003) a	nd BIOC2604)			
Offer in 2012 - 2013	1st sem						Examination	Dec
Offer in 2013 - 2014	Y							
Teaching Hours	Lectures:	: 12 hours;	Practicals: 12 x 5	hours with pre-	lab and post-lab	discussio	'n	
Assessment Method			en examination ( vritten assignmen			us asses	sment (50% weig	ghting) based on
Course Grade	A+ to F							
Grade Descriptors	A Comprehensive and in-depth understanding of the principles and applications of advance technologies in biochemistry; clear and effective ability to identify problems and generate solutions relating to applications in a laboratory setting; clear evidence of ability to evaluate experimental data; cohesive and systematic planning and organization of experimental design and presentation of experimental data.							
	B Comprehensive understanding of the principles and applications of advance technologies in biochemistry; 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.							
Textbooks		K, Walker ty Press, Ca		ples and Tech	niques of Bioch	nemistry a	and Molecular Bio	ology. Cambridge

BIOC3988 Biochemis	Academic Year	2012	
Offering Department	Biochemistry	Quota	10
Course Co-ordinator	Dr J D Huang, Biochemistry		

Course Aim	study. The gained in t	This course aims to offer students the opportunities to gain work experience in the industry related to their major of study. The workplace learning experience would be of great benefit to the students to apply their knowledge gained in the study to the real work environments. Students have to take on at least 160 hours of internship work either within the University or outside the University arranged by the School/Departments.					
Course Contents	various tas 2. Outside be supervi	sks as inst the unive ised unde	ructed by the Supervisor.	pervised by a staff member in an external agency related ernal agency (the External S Supervisor).	to the major of stu	dy. The student will	
Learning Outcomes	- recognize	e the strer the role o	letion of this course, studen ngths and limitations of their f science in our society; olving skills to solve novel a	area of training or expertise;			
Pre-requisites	Students a	are expect	ed to have satisfactorily cor	npleted the first two years stu	ıdy.		
Offer in 2012 - 2013	1st sem	2nd sem	Summer		Examination	No Exam	
Offer in 2013 - 2014	Y						
Teaching Hours	No formal 20 working		but it is expected that stude	ents are to work at least 160	hours (lunch hour e	excluded) in at least	
Assessment Method	their intern internship	iship expe period (in	rience. Supervisors are req	t is required to submit a writte uired to assess the students side the university, the Inter- cor).	based on their perf	ormance during the	
Course Grade	Pass/Fail						
Grade Descriptors	Pass	or assign in the job	ed by supervisor(s). Establishes ef	in the workplace. Successfully hand fective collaboration and communica ents set out in the Course Descrip	ation with supervisor(s),	colleagues, and clients	
	Fail	assigned clients in	by supervisor(s). Fails to establish	s in the workplace. Fails to handle n effective collaboration or commun ments set out in the Course Descri	ication with supervisor(	s), other colleagues, or	
Remarks	who have of Satisfactor internship Students w Visit http:// Enrolment	completed ry comple will be re who are in www.hku. of this co	I Year 1. tion of this course can be o ecorded on the student's t terested to enrol in this cour hk/science/current/bsc/inter urse is not conducted via th	npleted their Year 2 study. S counted towards the Experie ranscript. This course will I se should contact the Depart nship/ for more information. ne online course selection syster I has been obtained from the	ntial Learning requ be assessed on F ment to obtain the stem and should be	irement. Details of Pass or Fail basis. approval. e made through the	

BIOL0118 Bioethics	(6 credits		Academic Year	2012		
Offering Department	Biological	Sciences	Quota	40		
Course Co-ordinator	Prof F C L	eung, Biological Sciences				
Course Aim	The aim is	to explore the ethical implications of the latest ma	jor advances in biology and medic	ine.		
Course Contents	advancen genetics, and the u	The course will discuss research ethic between student and mentor, and ethical implications in recent major dvancements in biological and medical sciences. Major areas to be discussed include but are not limited to jenetics, reproduction, disease diagnosis and therapy, development, transplantation, aging, dying, environment ind the use of animals in research. Ethical and moral principles and implications for social framework and public policy raised by these advances will be discussed.				
Learning Outcomes	<ul> <li>be famile</li> <li>specificall</li> <li>to reflect</li> <li>understant</li> <li>to under</li> </ul>	sful completion of this course, students should be ar with the current ethical theories, discussions, related to the advancement of modern molecular t upon and formulate in a professional manner d and enter into a respectful dialogue with those w tand the basis of one's own position, as well as th ith the quandaries that arise when facing modern	and arguments taking place in t biology and genomics; their own opinions on these ma ho possess another point of view; e basis of another person's opinio	atters as well as t n;		
Pre-requisites	NIL					
Offer in 2012 - 2013	Not offere	ł	Examination	To be confirme		
Offer in 2013 - 2014	Y			'		
Teaching Hours	36 hours	f lectures/discussion				
Assessment Method		ur written examination (about 40% weighting); o ercises (about 60% weighting)	continuous assessment of essay	s, presentation and		
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.				
	С	C Demonstrate general but incomplete grasp of the subject matter covered. Show some evidence of analytical and critica abilities and logical thinking with limited competence in professional-level problem solving. Use communication skills and techniques and analysis of data and results to draw moderately appropriate but sometimes erroneous conclusions to real-work problems. Demonstrate moderately individual as well as collaborative-based organizational and presentational skills.				
	Demonstrate partial but limited grasp, with retention of some relevant information, of the subject matter covered. Show some evidence of coherent and logical thinking, but lacking competence in professional-level problem solving. Use communication skills and techniques and analysis of data and results to draw sometimes appropriate but often erroneous conclusions to rea world problems. Demonstrate individual as well as collaborative-based organizational and presentational skills of limited effectiveness.					
	Fail Demonstrate little or no grasp, with retention of little relevant information, of the subject matter covered. Show lack of coherent and logical thinking, and minimal competence in professional-level problem solving. Use communication skills and techniques and analysis of data and results ineffectively, leading generally to inappropriate and usually erroneous conclusions to real-world problems. Demonstrate ineffectiveness individual as well as collaborative-based organizational and presentational skills.					
References	Library &	veb-based reading materials				

BIOL0126 Fundame	ntals of biology (6 credits)	Academic Year	2012					
Offering Department	Biological Sciences	Quota	189					
Course Co-ordinator	Dr W Y Lui, Biological Sciences							
Course Aim	This course is designed to provide students a general concept of the various disciplines of biology and prepare them for further intermediate and advanced courses in biology. It takes a systematic approach to look at the ke principles that govern the survival of life forms.							
Course Contents	The following topics will be included: bacteria and viruses, structur consumption and energy, biosynthesis and growth, chemistry of life, D body defense mechanism, cell-cell communications: from nerve to l reproduction, cell culture and applications, nutrition and health.	NA and protein, chromos	omes and gene					
Learning Outcomes	<ul> <li>On successful completion of this course, students should be able to:</li> <li>Understand the basic concepts in cell biology such as cellular interaction, cell division and cell cycle;</li> <li>Acquire the basic knowledge on molecular biology including mo transcription and translation;</li> <li>Explain how different systems in our body perform their function;</li> <li>Understand the basic concepts in essential nutrients and energy balar</li> </ul>	lecular structure of biolo	•					
Pre-requisites	E or above in HKCEE Biol; and Not for students with E or above in AL Biol; and Not for students who have passed in BIOL1122, or have already enrolle Not for students who have passed in any BIOL2XXX level, or have already Not for students who have passed in any BIOL3XXX level, or have already	ady enrolled in these cour						
Offer in 2012 - 2013	1st sem	Examination	<b>D</b>					
Oner in 2012 - 2013		Examination	Dec					

Teaching Hours	36 hours of lectures / tutorials							
Assessment Method	One 2-hour	written examination (80% weighting) and continuous assessment (20% weighting)						
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	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.						
Textbooks	TBC							
References		logy - Today and Tomorrow (Thomson, 2007) rs: Biology - Understanding Life (Wiley, 2006)						
Remarks	The course v	vill be offered subjected to a minimum enrollment number.						

BIOL0127 Contemp	orary nutrit	on: insights and cor	ntroversies (3 credits)	Academic Year	2012					
Offering Department	Biological S	Sciences		Quota	50					
Course Co-ordinator	Dr E T S Li	Biological Sciences								
Course Aim	vitamins to health. Ho provide he	What you eat greatly affects your well-being. Everywhere we go, we are bombarded by different messages, from vitamins to functional food products, on how food components or treatments impact on body functions and health. How reliable is the information from the mass media? Are these facts or myths? This course aims to provide health conscious individuals the basic knowledge to decipher information related to nutrition and health. Such knowledge is essential to the building of good eating habits that could promote health for a lifetime.								
Course Contents	dietary sup genetically	The lectures, tutorial and guided studies will cover: healthy eating-concepts and practice; essential nutrients; dietary supplements; fad diets; weight management - energy intake and expenditure; food additives; and genetically modified foods. To better understand their own body and needs, students will have the chance to assess their own diet and measure body fat content.								
Learning Outcomes	<ul> <li>Distinguis</li> <li>Identify qui</li> <li>Understar</li> </ul>	On successful completion of this course, students should be able to: - Distinguish between facts and myths; - Identify quackery diets; - Understand the concept of health promotion; - Match their needs against dietary pattern.								
Pre-requisites	Not for stud	lents who have passed in	n BIOL1514, or have already en n BIOL2533, or have already en al Science Programme / Major /	nrolled in this course; and						
Offer in 2012 - 2013	Not offered			Examination	To be confirmed					
Offer in 2013 - 2014	N									
Teaching Hours	12 lecture,	plus 12 hours of guided s	study							
Assessment Method	One 2-hour	written examination (60%	%) and continuous assessment	: (40%)						
Course Grade	A+ to F									
Grade Descriptors	A									
	В									
	С									
	D									
	Fail									
Textbooks	Whitney E.	& Rolfes S.R. Understan	ding Nutrition (Thomson, 2008	)						
References	TBC									
Remarks	The course	will be offered subject to	a minimum enrollment numbe	r.						

BIOL0135 Introducto	Academic Year	2012	
Offering Department	Biological Sciences	Quota	80
Course Co-ordinator	Dr V Dvornyk, Biological Sciences		

Course Aim	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	aspects of genetics a plants and disease ar	The discovery of microorganisms, their diversity and evolutionary history; Basic aspects of microbial structure and function, physiology and metabolism; Microbial genetics and molecular genetics; Microbial ecology and interactions with animals, plants and the environment; an introduction to the importance of microorganisms in disease and medicine, public health, food production and spoilage, and biotechnology.							
Learning Outcomes	<ul> <li>describe</li> <li>evolutiona</li> <li>explain th</li> <li>eukaryotic</li> <li>these two</li> <li>identify th</li> </ul>	On successful completion of this course, students should be able to: - 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 similarites 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	Not for stu	dents who have already	passed in BIOL0129 before	э.					
Offer in 2012 - 2013	1st sem				Examination	Dec			
Offer in 2013 - 2014	Y								
Teaching Hours	36 hours o	f lectures and interactive	learning						
Assessment Method	One 2-hou	r MCQ examination (70%	6 weighting), coursework (	30% weighting)					
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.							
	B (70-84%) Approaches the standard of excellence. All criteria are addressed. Organization of ideas and clarity are very good. Ideasshow 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.							
	D	D (45-54%) Below acceptable standard. Most criteria are addressed. Organization of ideas and clarity are weak. Ideas show an incomplete understanding of concepts. Arguments are not persuasive. Presentation lacks creativity or is not appealing.							
	Fail		ility to identify major criteria. Ve No coherent argument. Presentat			Ideas show a lack of			
References	Madigan M	IT, Martinko JM & Parke	r J (2003) Brock Biology of	Microorganism	s				
Course Website	www.hku.ł	k/biosch							
Remarks	The course	will be offered subject t	o a minimum enrollment nu	umber.					

BIOL0604 Evolution	ary diversi	ty (6 credits)	Academic Year	2012				
Offering Department	Biological S	Sciences	Quota	60				
Course Co-ordinator	Prof R M K	Saunders, Biological Sciences						
Course Aim	To provide students with an introduction to the diversity of plant and animal life. Recent research has resulted i fundamental changes in our understanding of evolutionary history (phylogeny). Current evolutionary trees will b used as the basis for a survey of different groups in phylogenetic sequence, and for understanding how structures processes and behaviours have changed through time.							
Course Contents	(Rhodophy seedless v Ginkgophy Mollusca, (Batrachon	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).						
Learning Outcomes	<ul> <li>Interpret changes in</li> <li>Describe main taxon</li> </ul>	On successful completion of this course, students should be able to: - Interpret phylogenies in order to understand the relatedness of taxonomic groups and the pattern of evolutionar changes in structures, processes and behaviours. - Describe the characteristics of different evolutionary lineages of plants and animals and recall the names of the main taxonomic groups. - Explain the possible selective advantages of the highlighted structures, processes and behaviours.						
Pre-requisites	NIL							
Offer in 2012 - 2013	2nd sem		Examination	May				
Offer in 2013 - 2014	Y							
Teaching Hours	24 lectures	s and 36 hours of practical work						
Assessment Method	One 2-hou	r written assessment (70% weighting), and continuous assess	ment (30% weighting)					
Course Grade	A+ to F							
Grade Descriptors	A	Demonstrate thorough mastery at an advanced level of extensive knowle learning outcomes, with extensive use of named examples. Show eviden Apply highly effective presentation skills.						

	B Demonstrate substantial command of knowledge required for attaining most of the course learning outcomes, with some use of named examples. Show evidence of critical abilities and logical thinking. Apply effective presentation skills.
	C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes, with only limited use of named examples. Show evidence of some critical abilities and logical thinking. Apply moderately effective presentation skills.
	D monostrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes, with insufficient use of named examples. Show evidence of limited critical abilities and logical thinking. Apply limited presentation skills.
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes, without use of named examples. Show little or no evidence of critical abilities and logical thinking. Presentational skills are minimally effective or ineffective.
Textbooks	P. H. Raven, R. F. Evert & S. E. Eichhorn: Biology of Plants (Freeman & Worth, New York, 2005, 7th ed.) E. E. Ruppert & R. D. Barnes: Invertebrate Zoology (Saunders, 2003, 7th ed.)
References	TBC
Course Website	http://www.biosch.hku.hk/ecology/lsc/biol0604/
Remarks	The course will be offered subject to a minimum enrollment number.

BIOL0625 Ecology a	and evolution	on (6 cre	edits)			Academic Year	2012	
Offering Department	Biological S	Sciences				Quota	50	
Course Co-ordinator	Prof D Dud	dgeon, Bio	logical Sciences					
Course Aim	The interaction between organisms and their environment is addressed using an issue-based approach in order t explains how the ecology of plants and animals has been shaped by evolution through interactions with their livin and non-living environment. The course also demonstrates how we can understand and explain the significance or what we see in nature using scientific methods. A field course component provides the opportunity to investigat how the environment influences community composition, biodiversity and adaptive radiation in a variety of habitats							
Course Contents	and how m and adapta species an evolutionar interactions structuring, with the en record and environmen that threate Lectures a variety of H and their en	The environment influences organisms profoundly. It affects their present-day ecology (determining where they liv and how many can survive there) and, through natural selection acting over past generations, influences their forr and adaptations. Present day human-induced changes to the environment are also responsible for endangering species and degrading their habitats. This introductory course introduces some basic scientific principles o ecology and evolution, showing how they are linked to the environment by physiological tolerances and evolutionary adaptation which, in turn, lead to specialization and generate biodiversity. Individuals and their interactions will be a major focus of the course together with discussion of population dynamics, community structuring, life histories, and niche dynamics. The principles of ecology and evolution resulting from interaction with the environment will also be demonstrated by describing the origins of modern humans, including our foss record and relationship to other primates, and the main ecological transformations caused by humans and their environmental impacts. The course will conclude with an account of the importance of biodiversity, and the factor that threaten it globally. Lectures are complemented by a 5-day residential field course during the Reading Week when students visit a variety of HK habitats to study their biodiversity, community composition and the relationship between organism and their environment.						
	<ul> <li>understar and evoluti</li> </ul>	nd how s	cientific methods		riments, comparisons	s) are used to inve	0 0	
	adaptation - understar upon indivi - understar	and gene nd that ec idual orga nd the eco nd the co	rate biodiversity. blogy and behavio nisms. logical factors inf mmunity ecology	our can be interpret luencing evolution,	n, and how interact ed in the light of sele- using the human evo selected Hong Kong	ctive pressures fror lutionary tree as an	n the environme	
Pre-requisites	adaptation - understar upon indivi - understar - understar	and gene nd that ec idual orga nd the eco nd the co	rate biodiversity. blogy and behavionisms. logical factors inf mmunity ecology	our can be interpret luencing evolution,	ed in the light of sele	ctive pressures fror lutionary tree as an	n the environme	
Pre-requisites Offer in 2012 - 2013	adaptation - understar upon indivi - understar - understar organisms	and gene nd that ec idual orga nd the eco nd the co	rate biodiversity. blogy and behavionisms. logical factors inf mmunity ecology	our can be interpret luencing evolution,	ed in the light of sele	ctive pressures fror lutionary tree as an	n the environme	
•	adaptation - understar upon indivi - understar - understar organisms NIL	and gene nd that ec idual orga nd the eco nd the co	rate biodiversity. blogy and behavionisms. logical factors inf mmunity ecology	our can be interpret luencing evolution,	ed in the light of sele	ctive pressures fror lutionary tree as an habitats, and typio	n the environment example. cal adaptations of	
Offer in 2012 - 2013	adaptation - understar upon indivi - understar organisms NIL 1st sem Y 24 hours le during resi	and gene nd that ec idual orga nd the ecc nd the co found the found the ectures. A idential fie	rate biodiversity. blogy and behavio nisms. logical factors inf mmunity ecology re.	our can be interpret luencing evolution, and biodiversity of eld and laboratory v nt-centred learning	ed in the light of sele	tive pressures fror lutionary tree as an habitats, and typi <b>Examination</b>	n the environmen example. cal adaptations of Dec	
Offer in 2012 - 2013 Offer in 2013 - 2014	<ul> <li>adaptation         <ul> <li>understar</li> <li>upon indivi,</li> <li>understar</li> <li>understar</li> <li>organisms</li> </ul> </li> <li>NIL         <ul> <li>1st sem</li> <li>Y</li> </ul> </li> <li>24 hours le during resitutorials, as</li> </ul>	and generation of the economic of the economic of found the economic of found the economic of found the economic of the econom	rate biodiversity. blogy and behavin hisms. logical factors inf mmunity ecology re. least 36 hours fi ld course. Stude ading and a labo based on a field	bur can be interpret luencing evolution, and biodiversity of eld and laboratory v nt-centred learning ratory workshop.	ed in the light of selecusing the human evo selected Hong Kong vork, as groups and in	tive pressures fror lutionary tree as an habitats, and typic <b>Examination</b> dividuals, plus ~10 · (~24 hours) in th	n the environment example. cal adaptations of Dec Dhours of lecture e form of interne	
Offer in 2012 - 2013 Offer in 2013 - 2014 Teaching Hours	<ul> <li>adaptation         <ul> <li>understar</li> <li>upon indivie</li> <li>understar</li> <li>understar</li> <li>organisms</li> </ul> </li> <li>NIL         <ul> <li>1st sem</li> <li>Y</li> </ul> </li> <li>24 hours le during resist tutorials, as</li> <li>Final grade</li> </ul>	and generation of the economic of the economic of found the econom	rate biodiversity. blogy and behavin hisms. logical factors inf mmunity ecology re. least 36 hours fi ld course. Stude ading and a labo based on a field	bur can be interpret luencing evolution, and biodiversity of eld and laboratory v nt-centred learning ratory workshop.	ed in the light of selec using the human evo selected Hong Kong vork, as groups and in during the semester	tive pressures fror lutionary tree as an habitats, and typic <b>Examination</b> dividuals, plus ~10 · (~24 hours) in th	n the environment example. cal adaptations of Dec Dhours of lecture e form of interne	
Offer in 2012 - 2013 Offer in 2013 - 2014 Teaching Hours Assessment Method	<ul> <li>adaptation         <ul> <li>understar</li> <li>upon indivii,</li> <li>understar</li> <li>organisms</li> </ul> </li> <li>NIL         <ul> <li>1st sem</li> <li>Y</li> </ul> </li> <li>24 hours le during resitutorials, as</li> <li>Final grade semester e</li> </ul>	a and gene nd that ec idual orga nd the ecc nd the co found the count the ectures. A idential fie ssigned re le will be examination all learnin organizati	rate biodiversity. blogy and behavion insms. logical factors informunity ecology re. t least 36 hours field course. Stude sading and a labo based on a field on (60%). of complete or near-or g outcomes, and exc	eld and laboratory v nt-centred learning ratory workshop. course assessment complete understanding ind/or analytical skills ar	ed in the light of selec using the human evo selected Hong Kong vork, as groups and in during the semester	tive pressures fror lutionary tree as an habitats, and typic <b>Examination</b> dividuals, plus ~10 (~24 hours) in the assignment (40%) he subject as demonstr g local species and hat	n the environment example. cal adaptations of Dec D hours of lecture e form of internet 6), and an end-of ated by attainment of bitats. Show excellen	
Offer in 2012 - 2013 Offer in 2013 - 2014 Teaching Hours Assessment Method Course Grade	<ul> <li>adaptation - understar upon indivi - understar upon indivi - understar organisms</li> <li>NIL</li> <li>1st sem</li> <li>Y</li> <li>24 hours le during resi tutorials, as</li> <li>Final grade semester e</li> <li>A+ to F</li> </ul>	and generation of the eccures of found the eccord found the confound t	rate biodiversity. blogy and behavion insms. logical factors inf mmunity ecology re. t least 36 hours fi- idd course. Stude ading and a labor based on a field on (60%). of complete or near- g outcomes, and excord on a, presentational a required at degree ler of substantial undersu	eld and laboratory v nt-centred learning ratory workshop. course assessmed complete understanding ellent use of named (org and/or analytical skills ar vel.	ed in the light of selec using the human evo selected Hong Kong vork, as groups and in during the semester nt plus a coursework and a thorough grasp of t janism) examples, includin	tive pressures fror lutionary tree as an habitats, and typic <b>Examination</b> <b>Examination</b> dividuals, plus ~10 (~24 hours) in th (~assignment (40%) he subject as demonstr g local species and hat xcellent or outstanding monstrated by attainme ies and habitats. Show	n the environment example. cal adaptations of Dec D hours of lecture e form of internet b), and an end-of ated by attainment of bitats. Show excellen (for A+) work relative ent of the majority of good organizational	
Offer in 2012 - 2013 Offer in 2013 - 2014 Teaching Hours Assessment Method Course Grade	adaptation       - understar       upon indivi       - understar       - understar       organisms       NIL       1st sem       Y       24 hours leduring resitutorials, as       Final grade       semester endities       A+ to F	and generation of the eccures of the eccures of found the eccures of found the eccures of the ec	rate biodiversity. blogy and behavin nisms. logical factors inf mmunity ecology re. t least 36 hours fi ld course. Stude ading and a labo based on a field in (60%). of complete or near- g outcomes, and exc onal, presentational a required at degree le of substantial unders utcomes, and use of onal and/or analytical of general understan e attainment of mos onal, analytical, press	eld and laboratory v nt-centred learning ratory workshop. course assessmen complete understanding ellent use of named (org and/or analytical skills ar vel. standing and a good gr named (organism) exar skills and fieldwork tech ding with an adequate ( it of the learning outco	ed in the light of select using the human evo selected Hong Kong vork, as groups and in during the semester nt plus a coursework and a thorough grasp of th janism) examples, includin d fieldwork techniques. E asp of the subject as del mples, including local spec	ctive pressures from lutionary tree as an habitats, and typic <b>Examination</b> <b>Examination</b> ndividuals, plus ~10 (~24 hours) in th (~24 hours) in th (~25 hours) in th (~24 hour	n the environment example. cal adaptations of Dec Dec Dhours of lecture e form of internet 6), and an end-of ated by attainment of bitats. Show excellen (for A+) work relative ent of the majority of good organizational ired at degree level. trated by general bu examples. Show fail	

		boor or inadequate knowledge and understanding of the subject such that the majority of learning outcomes ained. Little or no evidence of familiarity with fieldwork techniques, habitats or organisms. Work fails to reach
Textbooks	library as an e-book.) Dawkins, R. (2006) The	1997) How Humans Evolved (4th Edition). Norton, NY. (5th Edition is available in HKU Blind Watchmaker. Penguin, London. gy: Theories and Applications (4th Edition). Prentice Hall, Singapore.
References	that are relevant to each Useful references for th Hillsides and Sandy Sh	ferences to the primary scientific literature, background reading and/or internet resources n lecture will be provided on the course website. ne field course are the Hong Kong Field Guides volumes 1-4 (Rocky Shores, Hillstreams, pores), and the following: R.T. (2011) The Ecology and Biodiversity of Hong Kong (Revised Edition). Cosmos Books,
Course Website	http://www.biosch.hku.h	k/ecology/lsc/biol0625/
Remarks		ed subject to a minimum enrollment number. idential field component during the reading week.

	(6 credits) Academic Year 2012								
Offering Department	Biological	Biological Sciences Quota 50							
Course Co-ordinator	Prof F C L	Prof F C Leung, Biological Sciences							
Course Aim	genome as well as lots is to open	The objective is to expose students to the impacts of genes to the society. Recent completion of the human genome and many agricultural crops and animals genomes, it brings not only promises of a better quality of life as well as lots of technical and ethical issues/challenges that general public need to deal with. The goal of this course is to open up students from all backgrounds to this basic unit of inheritance called the gene and its impact on various scientific and social disciplines.							
Course Contents	Introduction Basic general Basic Mole Basterial C Human Ge Human Ge Genes and Genes and Genes and Animal and Genes and	Content/topics include: Introduction and review of basic cell biology Basic genetic - The gene Basic Molecular Biology and Biotechnology - Recombinant DNA and cloning Bacterial Genes - Gene and Environment Human Genes/Human genome - history and its Impacts! Human Genome - The Amazing discovery! Genes and Biotechnology Genes and Disease Genes and Cancer Animal and Plant Cloning Genes and Agricultural/Food Biotechnology Genes and Human Behavior							
Learning Outcomes	- demonst - gain dee	On successful completion of this course, students should be able to: • demonstrate understanding and to explain the principle of inheritance, recombinant DNA and cloning. • gain deep understanding about the advancement of biotechnology. • determine and explain the benefits and shortcomings of the application of biotechnology knowledge.							
Pre-requisites				above in AL B e already pass		YSCN0004 or CC	ST9011 before.		
Offer in 2012 - 2013	Not offered	red					Examination	To be confirme	
Offer in 2013 - 2014	Y								
Teaching Hours	36 lectures	res, 12	2 tutorials, 4	8 reading and	self-study, 15 ess	ay/report writing, 3	0 presentation (inclu	ude preparation)	
Assessment Method					weighting), essay tation (30% weigh		orts (25% weighting)	, discussion forur	
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.							
	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.								
	С	C Demonstrate general but incomplete grasp of the subject matter covered. Show some evidence of analytical and critic abilities and logical thinking with limited competence in professional-level problem solving. Use communication skills ar techniques and analysis of data and results to draw moderately appropriate but sometimes erroneous conclusions to real-wor problems. Demonstrate moderately individual as well as collaborative-based organizational and presentational skills.							
	Demonstrate partial but limited grasp, with retention of some relevant information, of the subject matter covered. Show some evidence of coherent and logical thinking, but lacking competence in professional-level problem solving. Use communication skills and techniques and analysis of data and results to draw sometimes appropriate but often erroneous conclusions to rea world problems. Demonstrate individual as well as collaborative-based organizational and presentational skills of limited effectiveness.								
	Fail Demonstrate little or no grasp, with retention of little relevant information, of the subject matter covered. Show lack of coherent and logical thinking, and minimal competence in professional-level problem solving. Use communication skills and techniques and analysis of data and results ineffectively, leading generally to inappropriate and usually erroneous conclusions to real-world problems. Demonstrate ineffectiveness individual as well as collaborative-based organizational and presentational skills.								
References	Library & v	& web-	-based read	ling materials					
		rse wil							

BIOL1122 Functiona	al biology (	/ (6 cre	edits)			Academic Year	2012		
Offering Department	Biological	al Scien	ices		Quota	100			
Course Co-ordinator	Prof W W	Prof W W M Lee, Biological Sciences							
Course Aim				introduction to modern de I be examined at the mole					
Course Contents	photosynth topics in r	The following topics will be included: structure and function of macromolecules; mineral nutrition and photosynthesis in plants, influence of plant hormones on plant growth and development; genetics and related topics in molecular biology; cell signaling pathways and the endocrine system; the immune system and viral infections; reproduction; sex determination, sexual behavior and birth control.							
Learning Outcomes	<ul> <li>know the plant phys</li> <li>explain the physe</li> </ul>	In successful completion of this course, students should be able to: know the concepts of and interrelations between a variety of biological disciplines including molecular biology, lant physiology, endocrinology, immunology, reproduction and biotechnology; explain the connection of such disciplines to life and the application to research investigation; prepare and equip themselves for advanced courses (level 2 and level 3) in each of the topics.							
Pre-requisites	E or above Pass in Bl		L Biol; or 26, or already enrolled ir	n this course.					
Offer in 2012 - 2013	1st sem	2nd s	em			Examination	Dec May		
Offer in 2013 - 2014	N								
Teaching Hours	30 lectures	res							
Assessment Method	One 2-hou	our writt	ten examination (75% w	eighting) and continuous a	assessment	(25% weighting)			
Course Grade	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.								
	C 1. Satisfactory performance demonstrating adequate understanding of the subject matter. 2. Some insight into the scientific literatures. 3. Adequate writing and communication skills.								
	D	D 1. Limited performance demonstrating some understanding of basic subject matter. 2. Some ability to use the scientific literatures. 3. Limited writing and communication skills.							
	Fail		Poor understanding of subject municate.	matter. 2. Little to no insight	into use of the	e scientific literatures. 3	. Unable to write or		
Textbooks	Bruce A. e Alberts et	Hopkins W.G.: Introduction to Plant Physiology (John Wiley & Sons, 2nd or latest edition) Bruce A. et al.: Molecular Biology of the Cell (Garland Publishing, N.Y., 2002 or 2008 edition) Alberts et al.: Essential Cell Biology (Gaxland Publishing, N.Y., 2004 or 2010 edition) Mader S.S.: Human Reproduction (McGraw Hill, 2005, 3rd edition)							
References	TBC								
Remarks	The course	rse will b	be offered subject to a m	ninimum enrollment numbe	er.				

BIOL1125 Introduct	ion to bioc	nemistry (6 credits)		Academic Year	2012				
Offering Department	Biological	Sciences		Quota	100				
Course Co-ordinator	Dr C S C L	o, Biological Sciences							
Course Aim		This course is designed to provide undergraduate (non-biochemistry major) an overview of fundamental concept in biochemistry as well as hands-on experience in biochemical techniques.							
Course Contents	emphasis	An introduction to various biomolecules in terms of their structures, functions, syntheses and metabolisms, wit emphasis on amino acids, proteins, enzymes, carbohydrates, lipids and nucleic acids. The correlations betwee their biochemical properties and their roles in various life processes will be illustrated.							
Learning Outcomes	<ul> <li>describe</li> <li>understa</li> </ul>	On successful completion of this course, students should be able to: - describe the key structural features of carbohydrates, proteins, lipids and nucleotides; - understand the basic enzyme kinetic properties; - explain how the common sugars, fatty acids and amino acids are metabolized and synthesized in living cells.							
Pre-requisites		e in AL Biol or AL Chem or AS Cher dents who have passed in BIOC100			008); and				
Offer in 2012 - 2013	1st sem			Examination	Dec				
Offer in 2013 - 2014	Y								
Teaching Hours	24 lectures	and 3 laboratory sessions							
Assessment Method		ır written examination (60% weiç ıt (10% weighting)	ghting), a mid-term examina	tion (30% weighting	g), and practic				
Course Grade	A+ to F								
		Demonstrate thorough mastery at an adv							
Grade Descriptors	A	learning outcomes. Show strong analytical to apply knowledge to a wide range of co theories, principles, evidence and techniqu	omplex, familiar and unfamiliar situation						

	В	learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. General integration of theories, principles, evidence and techniques
	с	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Some partial integration of theories, principles, evidence and techniques
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Limited integration of theories, principles, evidence and techniques
	Fail	Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Little or no or inapt integration of theories, principles, evidence and techniques
Textbooks	D. L. Ne	Ison and M. M. Cox: Lehninger Principles of Biochemistry (W. H. Freeman and Company, 2005, 4th ed.)
References	TBC	
Remarks	The cou	rse will be offered subject to a minimum enrollment number.

BIOL1133 Biologica	Sciences	5 Iau	Jonatory C	oui 3e (0	creans	·/			Academic Year	201	2
Offering Department	Biological Sciences Quota 110										
Course Co-ordinator	Dr W Y Lui, Biological Sciences										
Course Aim	The aim is provide students a comprehensive training in basic laboratory techniques used in modern biologic: studies. The course will cover a number of techniques used by molecular biologists and microbiologists to condu scientific research.									0	
Course Contents	Module or - DNA & F Module tw - Centrifug Module th - Microsco	<ul> <li>This course will be divided into three modules and each module will have 3 laboratory sessions.</li> <li>Module one: Nucleic acid analysis</li> <li>DNA &amp; RNA isolation, spectrometry, gel electrophoresis, restriction enzyme analysis and DNA sequence analysis.</li> <li>Module two: Protein analysis</li> <li>Centrifugation, chromatography and SDS-PAGE electrophoresis.</li> <li>Module three: Microbiology</li> <li>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.</li> </ul>									
Learning Outcomes	- Demonst - Demonst - Master s - Understa	nstrate nstrate some stand	e basic labo	e in proper e and unde ratory tech t ways tha	use of sin rstanding iniques fo at microor	mple resea g of how ar or carrying rganisms v	arch equipi nd why cer out experi	ment; tain technic ments;	ues are used in a ording to their size		0.
Pre-requisites	Not for stu	studen	L Biol; or Pants who have	e already p	bassed in	BIOL0128		nd			
Offer in 2012 - 2013	2nd sem	۱							Examination	No E	Exam
Offer in 2013 - 2014	Y										
Teaching Hours	20 hours o	s of lea	ctures and	9 laborator	y sessior	ns (4 hours	s each sess	sion)			
Assessment Method	Continuou	ous as	ssessment (	100%)							
Course Grade	A+ to F										
Grade Descriptors	A Demonstrate thorough mastery at an advanced level of extensive knowledge required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought. 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. Evidence of analytical and critical abilities and logical thinking. Apply effective lab skills and techniques. Correct use of data of results to draw appropriate conclusions. Apply effective organizational and presentational skills.										
	C Demonstrate general but incomplete command of knowledge required for attaining most of the course learning outcomes. Evidence of some analytical and critical abilities and logical thinking. Apply moderately effective lab skills and techniques. Mostly correct but some erroneous use of data and results to draw appropriate conclusions. Apply moderately effective organizational and presentational skills.										
	D Bemonstrate partial but limited command of knowledge required for attaining some of the course learning outcomes. Evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Apply partially effective lab skills and techniques. Limited ability to use data and results to draw appropriate conclusions. Apply limited or barely effective or ganizational and presentational skills.										
	Fail	litt	ttle or lack of a	nalytical and use of data a	critical abili and results	ities, logical a	and coherent	thinking. Apply	ing the course learning / minimally effective or lusions. Organization	ineffectiv	e lab skills and

<b>BIOL1514 Nutrition a</b>	Academic Year	2012						
Offering Department	Biological Sciences Quota 150							
Course Co-ordinator	Dr E T S Li, Biological Sciences							
Course Aim	To introduce the fundamental concepts of nutrition through an integrated ap between diet and intermediary metabolism	proach in discussing	the interactions					

Course Contents	macronutri	Essential nutrients and their requirements. Energy balance and caloric value of foods. Metabolic control of macronutrient utilization. Nutritional impacts of hexoses, long chain polyunsaturated fatty acids and amino acids. Dietary recommendations.							
Learning Outcomes	<ul> <li>understar</li> <li>be able to control of g</li> <li>understar</li> <li>understar</li> <li>importance</li> </ul>	sful completion of this course, students should be able to: nd the concept of nutrient requirements o explain how different organs coordinate to achieve metabolic glucose homeostasis nd the metabolic pathways of various polyunsaturated fatty acids nd the theoretical constructs of nitrogen requirement and the e of the urea cycle o assess the impacts of dietary inadequacy							
Pre-requisites	E or above	in AL Biol; or Pass in BIOL0126							
Offer in 2012 - 2013	2nd sem		Examination	Мау					
Offer in 2013 - 2014	Ν								
Teaching Hours	24 hours of	f lectures and 12 hours of tutorials/guided studies							
Assessment Method	One 2 ho weighting)	One 2 hours written examination (70% weighting), a mid-term test (15% weighting) and coursework (15% weighting)							
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.								
	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 organization / 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.								
	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.								
			and draw sometimes e	rroneous conclusions.					
	Fail		subject matter covered. te information and ident	Show lack of coherent ify problems. Seriously					
Textbooks	Frayn K.N. Champe P	Demonstrate basic organization / writing skills. Demonstrate little or no grasp, with retention of little relevant information, of the s and logical thinking, and minimal competence in problem solving. Fail to integrat	subject matter covered. te information and ident bemonstrate poor organ 0 0 0 0 chemistry. Lippinc	Show lack of coherent fy problems. Seriously zation / writing skills.					
Textbooks References	Frayn K.N. Champe P	Demonstrate basic organization / writing skills. Demonstrate little or no grasp, with retention of little relevant information, of the sand logical thinking, and minimal competence in problem solving. Fail to integrat deficient in ability to analyze and interpret scientific data and draw conclusions. D Metabolic regulation: A Human Perspective. Wiley-Blackwell, 2010. C., Harvey R.A. & Ferrier D.R. Lippincott's Illustrated Reviews: Bio	subject matter covered. te information and ident bemonstrate poor organ 0 0 0 0 chemistry. Lippinc	Show lack of coherent fy problems. Seriously zation / writing skills.					

BIOL1528 Food che	mistry (6 credits)	Academic Year	2012				
Offering Department	Biological Sciences Quota 110						
Course Co-ordinator	Dr J C Y Lee, Biological Sciences						
Course Aim	To provide a basic understanding of chemistry in food systems, and to provide practical training in chemistry related to food science and nutrition.	de					
Course Contents	The course will cover fundamental and relevant chemistry and functionality 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 methods used in analyzing foods. A series of laboratory sessions will cover analysis of food components, protechemistry, lipid oxidation, properties of sugars and starches, enzymatic ar and sensory analysis of foods.	, the sin					
Learning Outcomes	<ul> <li>On successful completion of this course, students should be able to:</li> <li>Understand the functions and properties of major and minor food components.</li> <li>Understand the basic chemistry behind food processing.</li> <li>Have integrated their knowledge of biological and chemical principles into a food science and nutrition context.</li> </ul>						
Pre-requisites	(E or above in AL or AS Chem; or Pass in CHEM0004 or CHEM0008); and Not for students who have already passed in BIOL1123 before; and Not for students who have already passed in BIOL1513 before.						
Offer in 2012 - 2013	2nd sem	Examination	May				
Offer in 2013 - 2014	Υ						
Teaching Hours	24 lectures and 18 hours laboratory sessions						
Assessment Method	One 2-hour written examination (80% weighting) and course work assessme	ent (20% weighting)					

Grade Descriptors	A	Demonstrate thorough grasp of the subject matter covered. Show extensive knowledge and understanding of the topics covered and can readily apply this knowledge. Critically use lab skills and techniques and analysis of data and results to draw appropriate and insightful conclusions.
	В	Demonstrate substantial grasp of the subject matter covered. Show thorough knowledge and understanding of the content and a high level of competence in the topics covered and able to apply this knowledge and skills to most situations. Use lab skills and techniques and analysis of data and results to draw generally appropriate conclusions.
	С	Demonstrate general but incomplete grasp of the subject matter covered. The student has a sound knowledge and understanding of the main areas of content and has achieved an adequate level of competence in the topics covered. Use lab skills and techniques and analysis of data and results to draw moderately appropriate conclusions.
	D	Demonstrate partial but limited grasp, with retention of some relevant information of the subject matter covered. Show a basic knowledge and understanding of the content and has achieved a limited level of competence in the topics covered. Use lab skills and techniques and analysis of data and results to draw appropriate conclusions occasionally.
	Fail	Demonstrate little or no grasp, with retention of little relevant information, of the subject matter covered. Show elementary knowledge and understanding in few areas of the content and has achieved very limited competence in some of the topics covered. Use lab skills and techniques and analysis of data and results ineffectively, leading generally to inappropriate and usually erroneous conclusions.
Textbooks		DR, Food Chemistry (Marcel Dekker 4th Ed, 2008) Grosch W, Schieberle, P, Food Chemistry (Springer 4th Ed, 2009)
References	TBC	
Remarks	The course	e will be offered subject to a minimum enrollment number.

BIOL1608 Biostatist	tics (6 cred	dits)					Academic Year	2012		
Offering Department	Biological	Biological Sciences Quota 60								
Course Co-ordinator	Dr K M Y Leung, Biological Sciences									
Course Aim	elementary statistical nutritional	ry to inte method science researc	ermediate lev ds to experii æ, ecology a	vel, with an er mental and o and environm	nphasis on prac observational da ental sciences.	Students will expl		which scientist		
Course Contents	probability contingend techniques statistics; u	Sampling and experimental design; descriptive statistics; hypothesis testing; analysis of frequency distributions; probability distributions (e.g. Normal, binominal and Poisson) and their applications; testing of goodness of fit and contingency tables; analysis of variance and multiple comparisons; correlation and regression techniques; power analyses; non-parametric methods; introduction to multivariate statistics; use of appropriate computer software packages for data processing, analysis and graphical presentation. To illustrate each statistical method, examples will be drawn from real cases.								
Learning Outcomes	- Formulat - Design e - Make qua - Use EXC	ate biolog experime Jantitativ CEL and and the	gical question ents effective ve estimation d SPSS to ca	ns into statisti ely of biologicall rry out most o	udents should b cal questions y meaningful pa of the statistical y used statistica	rameters computations				
Pre-requisites	Pass in Bl	IOL062	5							
Offer in 2012 - 2013	1st sem						Examination	Dec		
Offer in 2013 - 2014	Y									
Teaching Hours	24 lectures	es; 40 hc	ours of comp	uter laborator	y/tutorial/projec	ts				
Assessment Method	One 2-hou	ur open-	-book examir	nation (50% v	veighting) and c	ourse assignments	/projects/quizzes (50	0% weighting)		
Course Grade	A+ to F									
Grade Descriptors	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 highly effective computational skills and techniques for basic statistical analyses. Be able to critically use data and statistical results to draw appropriate and insightful conclusions. Apply highly effective organizational and presentational skills.								
	В	B Demonstrate substantial grasp of the subject and skills required for attaining at least most of the course learning outcomes. Present evidence of analytical and critical abilities and logical thinking. Apply effective computational skills and techniques for basic statistical analyses. Be able to correctly use data and statistical results to draw appropriate conclusions. Apply effective organizational and presentational skills.								
	С	C Demonstrate general but incomplete grasp of the subject and skills required for attaining some of the course learning outcomes. Present evidence of some analytical and critical abilities and logical thinking. Apply moderately effective computational skills and techniques for basic statistical analyses. Demonstrate mostly correct but some erroneous use of data and statistical results to draw appropriate conclusions. Apply moderately effective organizational and presentational skills.								
	D	D Demonstrate partial and limited grasp of the subject and skills required for attaining some of the course learning outcomes. Present evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Apply limited or barely effective computational skills and techniques for basic statistical analyses. Demonstrate limited ability to use data and statistical results to draw appropriate conclusions. Apply limited or barely effective organizational and presentational skills.								
	Fail Demonstrate evidence of little 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 and 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.									
Textbooks	Zar, J. H.: edition)	: Biostat	tistical Analys	sis (Prentice-I	Hall / Englewood	d Cliffs, N.J., 1999,	4th			
Course Website	http://www	w.biosch	n.hku.hk/ecol	ogy/lsc/biol16	608/					

BIOL2109 Economic	botany (6 c	credits)			Academic Year	2012			
Offering Department	Biological S	Quota	30						
Course Co-ordinator	Dr C S C Lo, Biological Sciences								
Course Aim	This course provides an understanding and appreciation of plants that are economically important to human. Students are expected to become scientifically knowledgeable on the plants and plant products they encounter everyday. It also aims to make them functionally literate with respect to plant species that are found locally.								
Course Contents	manipulatio (e.g. cereals plant oils ar cultivated, c	n of plants by po s and legumes), nd waxes, herbs	eople, origin of agricu stimulating beverage , spices and perfume exotic plants growin	tions between plants and ulture, methods of plant pro s (coffee and tea) and alcol es, etc. Students will be tra g in Hong Kong. Knowledg	pagation, major plar nolic beverages, plar ined to recognize th	nt families as food at fibers and wood e common native			
Learning Outcomes	<ul> <li>describe a</li> <li>discuss t</li> <li>production a</li> <li>recognize</li> <li>application</li> </ul>	nd appreciate th he scientific pri of plant-derived p an appreciable values	products	eir daily lives he reproduction and propa pecies locally and describe	0	•			
Pre-requisites	Pass in BIO	L0126 or BIOL0	604 or BIOL1122 or I	BIOL1528					
Offer in 2012 - 2013	Not offered				Examination	No Exam			
Offer in 2013 - 2014	Y					-			
Teaching Hours	24 lectures	and 36 hours of	laboratory sessions,	case studies and field trips					
Assessment Method	One 2-hour	written paper (5	0% weighting) togeth	er with laboratory and case	study assessments	(50% weighting)			
Course Grade	A+ to F								
Grade Descriptors									
Grade Descriptors	A								
Grade Descriptors	A B								
Grade Descriptors									
Grade Descriptors	В								
Grade Descriptors	B C								
Grade Descriptors	B C D Fail	on and M. C. Oc	gorzaly: Economic Bo	tany (Boston: McGraw-Hill,	2001)				
Textbooks	B C D Fail B. B. Simps	on and M. C. Og adings to be dist		tany (Boston: McGraw-Hill,	2001)				
	B C D Fail B. B. Simps Selected rea		ributed in class	tany (Boston: McGraw-Hill,	2001)				

BIOL2111 Molecular	r microbiol	ology (6 c	redits)							Academic \	ear	2012
Offering Department	Biological Sciences							Quota		50		
Course Co-ordinator	Dr J S H T	Dr J S H Tsang, Biological Sciences										
Course Aim	This course is intended for biology, biotechnology and biochemistry students who would like to understand the modern fundamentals of microbiology. At the end of the course the students are expected to know the physiological, biochemical and molecular aspects of microbiology.											
Course Contents	in the envi changes a considered	The basic biochemistry of microorganisms will be described. The intrinsic factors that affect the growth of microbes in the environment will be examined. The adaptation of the microbes to the environment by means of physiologica changes and genetical alterations will be illustrated. The molecular biology of bacteria and viruses will be considered. The molecular biology of plasmids and transposable elements and their association with medical aspect will be discussed. The use of modern technology in studying microorganisms will be explored.										
Learning Outcomes	- Understa - Compreh - Explain th - Realize th	and the int hend the n the biology the import	bletion of thi trinsic reorganajor modes of bacterio ance of tran velopment o	anization s of regul ophages a isposable	of micr lation in and plas e eleme	robes in the ministricts the the ministricts the the the second s the second se	n respor crobe; he survi	nse to the ival of the	e microt		nts;	
Pre-requisites	Pass in Bl	BIOL0126 c	or BIOL0129	or BIOL	.1122							
Offer in 2012 - 2013	2nd sem									Examinatio	n	Мау
Offer in 2013 - 2014	Y											
Teaching Hours	24 hours o	of lectures	and 30 hou	urs of lab	oratory	sessior	ns/stude	ent cente	red acti	vity.		
Assessment Method	One 2-hou	our written e	examination	n (70% w	eighting	g) and c	ourse v	vork asse	essment	(30% weight	ng)	
Course Grade	A+ to F											
Grade Descriptors												aining all the cours s and logical thinkin

Remarks	The course will be offered subject to a minimum enrollment number.
References	Maloy S.R., Cronan J.E. & Freifelder D. Microbial Genetics (Jones & Bartlett 1994, 2nd ed.) Willey, Sherwood & Woolverton: Prescott's Principles of Microbiology (McGraw Hill 2009) Watson, Baker, Bell, Gann, Levine & Losick: Molecular Biology of the Gene (CSHL Press 2008, 6th ed.) Madigan, Martinko, Dunlap & Clark: Brock Biology of Microorganisms (Pearson 2009, 12th ed.)
Textbooks	TBC
	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. Evidence of little or lack of analytical and critical abilities, logical and coherent thinking. Apply minimally effective or ineffective lab skills and techniques. Misuse of data and results and/or unable to draw appropriate conclusions. Organization and presentational skills are minimally effective or ineffective.
	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.
	C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Demonstrate general but incomplete grasp of the subject. Evidence of some analytical and critical abilities and logical thinking. Apply moderately effective lab skills and techniques. Mostly correct but some erroneous use of data and results to draw appropriate conclusions. Apply moderately effective organizational and presentational skills.
	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Demonstrate substantial grasp of the subject. Show evidence of analytical and critical abilities and logical thinking. Apply effective lab skills and techniques. Correct use of data of results to draw appropriate conclusions. Apply effective organizational and presentational skills.
	A 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.

BIOL2112 Plant phy	siology (6	(6 credits)			Academic Year	2012			
Offering Department	Biologica	Biological Sciences Quota 100							
Course Co-ordinator	Dr W K Y	Dr W K Yip, Biological Sciences							
Course Aim		To give an understanding of plant processes such as plant growth and development and their regulatory mechanisms.							
Course Contents	transduct	ction of plar orphogenes	hemical nature, metabolism, structure-acti t hormones. Hormonal transport. Selectec s, seed germination, domancy, and plan	l topics on pla	nt growth and deve	lopment including			
Learning Outcomes	- understa - understa	stand the stu stand biotec	letion of this course, students should be ab dy of plant physiology using mutants in Ara inological opportunities by manipulating ger ulation of plant growth and development by	bidopsis; ne expression;					
Pre-requisites	Pass in B	BIOL1121 d	r BIOL1122 or BIOL0126						
Offer in 2012 - 2013	1st sem				Examination	Dec			
Offer in 2013 - 2014	Y								
Teaching Hours	24 lecture	res; 30 hou	s of laboratory/tutorials/seminars						
Assessment Method	One 2-ho	our written	examination (75% weighting) together with a	assessment of	practical work (25%	weighting)			
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.								
	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.								
	D In written examination and practical sessions: Some knowledge of the material is evident, but there are serious deficiencies in understanding, organization, clarity or accuracy. Write-ups that are unduly brief would fall into this category.								
	Fail In written examination and practical sessions: Poor knowledge and understanding of the subject, a lack of coherent and organization, and answers are largely irrelevant.								
Textbooks	2nd ed.)	)	ormones: Physiology, Biochemistry and Mo duction to Plant Physiology (Wiley, 1999, 2		ıy (Martinus Nijhoff	Publishers, 1995,			
References	TBC								
Remarks	The cours	irse will be o	ffered subject to a minimum enrollment nun	nber.					

BIOL2115 Cell biolog	Academic Year	2012						
Offering Department	Biological Sciences Quota 120							
Course Co-ordinator	Dr A S T Wong, Biological Sciences							
Course Aim	To provide a coherent understanding of the structure and function of cells, a cell culture and instrumentation in biology and biotechnology.	nd the principles and	d applications of					

Course Contents	Cellular m transport. matrix inter II. Techniqu Mammaliar formulation cryopresen III. Techniq Root and s	<ul> <li>Cell biology</li> <li>Cellular 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</li> <li>I. Techniques in animal cell culture</li> <li>Mammalian cells in culture. Primary and continuous cell lines. Cell types and cell growth parameters. Media formulation, growth factors and design of serum-free media. Culture lab facilities and sterilization. Mechanism of cryopreservation.</li> <li>II. Techniques in plant cell culture</li> <li>Root and shoot cultures. Explant regeneration. Protoplasts. Secondary metabolites.</li> </ul>					
Learning Outcomes	<ul> <li>acquire fu</li> <li>demonstration</li> </ul>	In successful completion of this course, students should be able to: acquire fundamental knowledge on cell biology and cell technology; demonstrate basic laboratory techniques on cell culture; gain insight into real-life applications in cell biology and cell technology.					
Pre-requisites	Pass in BIC	DL1121 or BIOL1122 or BIOL0126 or BIOC1001 or BIOL1125					
Offer in 2012 - 2013	1st sem		Examination	Dec			
Offer in 2013 - 2014	Y						
Teaching Hours	24 lectures animals.	s and 5 laboratory sessions, of which one involves the use of	tissues collected f	rom euthanatized			
Assessment Method	One 2-hou	r written examination (80% weighting) together with assessment of	f practical work (20%	6 weighting)			
Course Grade	A+ to F						
Grade Descriptors	A Demonstrate thorough mastery at an advanced level of extensive knowledge required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective 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	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. Writings mostly indicate informed, intellectual engagement with concepts or theories but not always with sufficient depth, breadth or understanding.					
	Demonstrate partial but limited command of knowledge required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational skills. Writings indicate some intellectual engagement with concepts or theories but mostly at a superficial level.						
	Fail	Demonstrate little or no evidence of command of knowledge required for atta analytical and critical abilities, logical and coherent thinking. Show very little or n Organizational skills are minimally effective or ineffective. Writings reveal an abs or theories. Writings are irrelevant or superficial.	o ability to apply knowled	ge to solve problems.			
Textbooks	Mather, J.	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)					
References	TBC						
Remarks	The course	will be offered subject to a minimum enrollment number.					

BIOL2118 Conserva	tion genetics (6 credits)	Academic Year	2012			
Offering Department	Biological Sciences	Quota	50			
Course Co-ordinator	Dr M Sun, Biological Sciences	r M Sun, Biological Sciences				
Course Aim	The course aims to familiarize students with fundamental principles The theories and methods will be taught with a balanced ram amphibians, fish, invertebrates, as well as plants - to demonstrate range of important questions in real world conservation practice.	ge of examples - mamma	lls, birds, reptiles			
Course Contents	Introduction to conservation genetics. Part I. Evolutionary Genetics of Natural Populations: - genetic diversity - characterizing genetic diversity: single loci and quantitative variatio - evolutionary impacts of natural selection, mutation, migration and t - genetic consequences of small population sizes; - maintenance of genetic diversity; - population genomics. Part II. Effects of Population Size Reduction: - loss of genetic diversity in small populations; - inbreeding; - inbreeding; - inbreeding depression; - genetically viable populations. Part III. From Theory to Practice: - resolving taxonomic uncertainties and defining management units;	their interactions in large pop	oulations;			
	<b>25</b> 0					

	- genetic i - genetic r - genetic r	nanagement of wild populations; ssues in introduced and invasive species; nanagement of captive populations; nanagement for reintroduction; olecular genetics in forensics and understanding species biology.					
Learning Outcomes	<ul> <li>demonst</li> <li>know the</li> <li>know the</li> <li>understa</li> <li>potential in</li> <li>understa</li> <li>implicatior</li> <li>gain abil</li> </ul>	Dn successful completion of this course, students should be able to: demonstrate an advanced understanding of the concepts of conservation genetics; know the criteria for determining the conservation status of endangered, vulnerable, or threatened species; know the methods for characterizing genetic diversity at population and species levels; understand the relationships between genetic diversity, inbreeding, reproductive fitness, and evolutionary botential in wild populations; understand the effects of habitat fragmentation and population size reduction on genetic diversity and the mplications in managing nature reserves; gain ability to integrate genetic information in resolving taxonomic uncertainties, in understanding species biology, n setting conservation priorities, and in developing management strategies for wild and captive populations.					
Pre-requisites	Pass in Bl	OL0604 or BIOL1106 or BIOL1122					
Offer in 2012 - 2013	Not offere	d	Examination	To be confirmed			
Offer in 2013 - 2014	Υ						
Teaching Hours	24 hours of	of lectures, 24 hours of tutorials/project/practical, and 100 hours o	f reading/self-study				
Assessment Method		ur written examination (50% weighting); continuous assessment ( nment, classroom participation, and project presentation)	50% weighting, incl	uding quiz, mid-term			
Course Grade	A+ to F						
Grade Descriptors	A	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.					
	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	C 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 d with relatively simple problems, but also demonstrating serious deficiencies in knowledge required for attaining most of the expected course learning outcomes.					
	Fail	Poor performance in all aspects of the course, showing little evidence of lear matter, demonstrating deficiencies serious enough to make it inadvisable to pr					
Textbooks		Frankham et al: Introduction to Conservation Genetics (Cambridge University Press, 2009, 2nd ed.) e-book and other websites					
Remarks		to be listed e will be offered subject to a minimum enrollment as required by \$	SBS.				

<b>BIOL2119 Genetics</b>	(6 credits)			Academic Year	2012		
Offering Department	Biological	ciences		Quota	100		
Course Co-ordinator	Dr C S C I	C S C Lo, Biological Sciences					
Course Aim	This cours	aims to provide students with fur	ndamental knowledge of classi	cal, molecular and pop	oulation genetics.		
Course Contents	and mapp recombination genetics.	nclude cellular reproduction, prin ng, concept and definition of on, DNA transposition, extranuc rudents are strongly encouraged topics in molecular genetics.	the gene, molecular mecha lear inheritance, developmenta	nisms of mutation, lal genetics, quantitativ	DNA repair and ve and population		
Learning Outcomes	- Apprecia - Use diffe	ful completion of this course, stu- the beauty of genetic organizati ent genetic principles to explain h litative and quantitative experim	ons in nature ereditary traits observed in nat		al and population		
Pre-requisites		L1121 or BIOL1122 or BIOL1125 ents who have already passed in		9.			
Offer in 2012 - 2013	1st sem			Examination	Dec		
Offer in 2013 - 2014	Y						
Teaching Hours	24 lectures	and 18 hours of laboratory/tutoria	al				
Assessment Method	Written ex	mination (70%), Laboratory repor	rts and assignments (30%)				
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 cour learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ab to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Integration of the full range of appropri- theories, principles, evidence and techniques					
	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. General integration of theories, principles, evidence and techniques						

	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
	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Limited integration of theories, principles, evidence and techniques
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Little or no or inapt integration of theories, principles, evidence and techniques
Textbooks	W S Klug, M R Cummings, Spencer C A, Palladino M A: Concepts of Genetics (Pearson, 2009, 9th ed.)
References	TBC
Remarks	This course is equivalent to BIOL2116 Genetics I or BIOL2117 Genetics II offered previously.
	The course will be offered subject to a minimum enrollment number.

BIOL2203 Reproduc	tion & rep	produc	ctive biotechnolog	gy (6 credits)		Academic Year	2012	
Offering Department	Biological	al Scienc	ces			Quota	50	
Course Co-ordinator	Prof A O L	Prof A O L Wong, Biological Sciences						
Course Aim		To provide a comprehensive overview on modern concepts and recent advancements in reproductive biology & biotechnology.						
Course Contents	sexual be reproducti for fertility	The course will cover the basic concepts of reproduction, evolution of sex & sex chromosomes, human sexuality & sexual behavior, molecular mechanisms for sex determination, developmental aspects of gametogenesis and reproductive systems, neuroendocrinology of reproductive functions, and recent advancements in biotechnology for fertility control, assisted reproduction, stem cells & regenerative medicine, germ cell transplantation, and animal cloning & transgenesis.						
Learning Outcomes	<ul> <li>(1) have a the mecha</li> <li>(2) have a cycle, sex</li> <li>(3) have a reproduction (4) comprised and the comparison of the comparison of the cycle of</li></ul>	On successful completion of this course, students should be able to: 1) have a broad understanding of reproductive biology ranging from evolution of sex & reproductive strategies to he mechanisms for sex determination & development of reproductive structures; 2) have an appreciation of the endocrine control of reproductive functions including the regulation of reproductive sycle, sexual behavior, parental care, and pregnancy & giving birth to baby; 3) have a basic understanding on the causes of human infertility and different methods available for assisted eproduction & reproductive therapeutics; 4) comprehend a wide range of modern technology for gene therapy & stem cell engineering, animal cloning & ransgenesis, and recent advancement in regenerative medicine, artificial organs, and germ cell transplantation.						
Pre-requisites	E or abov	ve in AL	Biol; or Pass in BIOL	_0126 or BIOL1107				
Offer in 2012 - 2013	1st sem					Examination	Dec	
Offer in 2013 - 2014	Y						'	
Teaching Hours	24 hours l	s lectures	s, 9 hours laboratory	work-contact and 4 hou	rs site visit of fer	ility clinic		
Assessment Method	One 2-ho report (15			% weighting), test & cor	ntinuous assessr	nent (15% weightir	g) and laborator	
Course Grade	A+ to F							
Grade Descriptors	A Demonstrate thorough mastery at an advanced level of extensive knowledge required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective lab skills and techniques. Critical use of data and results to draw appropriate and insightful conclusions. Apply highly effective organizational and presentational skills.							
	B Demonstrate substantial command of a broad range of knowledge required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective lab skills and techniques. Correct use of data of results to draw appropriate conclusions. Apply effective organizational and presentational skills.							
	C Demonstrate general but incomplete command of knowledge required for attaining most of the course learning outcome Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most famili situations. Apply moderately effective lab skills and techniques. Mostly correct but some erroneous use of data and results draw appropriate conclusions. Apply moderately effective organizational and presentational skills.				edge to most familiar			
	D Demonstrate partial but limited command of knowledge required for attaining some of the course learning outcomes. S evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to a knowledge to solve problems. Apply partially effective lab skills and techniques. Limited ability to use data and results to a appropriate conclusions. Apply limited or barely effective organizational and presentational skills.				mited ability to apply			
	Fail	analy Apply	vtical and critical abilities, lo y minimally effective or inel	nce of command of knowled ogical and coherent thinking. ffective lab skills and techniq presentational skills are minim	Show very little or no ues. Misuse of data a	ability to apply knowled and results and/or unabl	ge to solve problems.	
Textbooks	TBC							
References	(2) D. K. (3) D. T. ( (4) P. J. (	<ol> <li>C. G. Nicholas (2011) "Reproduction and Adaptation", Cambridge University Press.</li> <li>D. K. Gardner (2011) "Human Assisted Reproductive Technology", Cambridge University Press.</li> <li>D. T. Carrell (2010) "Reproductive Endocrinology and Infertility", NY, Springer.</li> <li>P. J. Chedrese (2009) "Reproductive Endocrinology: A Molecular Approach", NY, Springer .</li> <li>K. K. Schillo (2009) "The Reproductive Physiology of Mammals", NY, Delmar Cengage Learning.</li> </ol>						
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Academic Year 2012

Offering Department	Biological	Sciences				Quota	100	
Course Co-ordinator	Dr B L Lim	Dr B L Lim, Biological Sciences						
Course Aim				the animal immune search and diseas	ne system. Topics v e diagnosis.	vill also include the	e application of a	
Course Contents	properties of lymphoi and paras	munological functions in the vertebrates and analogous activities in invertebrates. Structures and biological roperties of immunoglobulins and T-cell receptors. Divergence of antibody genes. Emergence and characteristic f lymphoid tissues. Major histocompatibility complex. Complement pathways. Immunity against bacteria, viruses nd parasites. AIDS, Vaccination, hypersensitivity, and autoimmunity. Immunological tests and immunochemical echniques using non mammalian and mammalian antibodies and their application to various biological problems.						
Learning Outcomes	<ul> <li>describe</li> <li>mechanisr</li> <li>describe</li> <li>explain th</li> <li>explain h</li> </ul>	On successful completion of this course, students should be able to: • 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; • describe the organization of the mammalian immune system in terms of genes, cells and tissues; • explain the underlying mechanisms associated with transplant rejection, transfusion reaction and vaccination; • explain how the immune system responds to infections by bacteria, viruses and parasites; • understand antigen-antibody interaction and the principle of immunoassays.						
Pre-requisites	Pass in Bl	IOC1001 or E	BIOL1125 or BIO	L1121 or BIOL112	22 or BIOL0126			
Offer in 2012 - 2013	2nd sem	2nd sem Examination May					May	
Offer in 2013 - 2014	Y							
Teaching Hours				ssions during Rea from euthanatized	ading Week. One of I animals.	the practical sess	ions involves the	
Assessment Method	One 2-hou	ur written exa	mination (80% w	eighting), continu	ous assessment of p	ractical work (20%	weighting)	
Course Grade	A+ to F							
Grade Descriptors	A	Exceptionally good performance demonstrating comprehensive understanding of the subject matter; Critical insight an analysis into the scientific literatures; Superior writing, presentation and group communication skills.				Critical insight and		
	B Good performance demonstrating full understanding of the subject matter; Coherent insight and analysis into the scientific literatures; Good writing, presentation and group communication skills.							
	C Satisfactory performance demonstrating adequate understanding of the subject matter; Some insight into the scientific literatures; Adequate writing and communication skills.							
	D		ormance demonstrati ng and communicatio		ig of basic subject matter;	Some ability to use the	e scientific literatures;	
	Fail	Poor underst	anding of subject ma	atter; Little to no insight	into use of the scientific li	teratures; Unable to wri	te or communicate.	
Textbooks	Benjamin	J. Kuby: Immunology (Freeman and Company, 2000, 2003 or 2007, 6th 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)						
References	TBC							
Remarks	The course	se will be offe	red subject to a r	ninimum enrollme	nt number.			

BIOL2207 Endocrine	ology: human physiology II (6 credits)	Academic Year	2012
Offering Department	Biological Sciences	Quota	90
Course Co-ordinator	Prof B K C Chow, Biological Sciences		
Course Aim	To provide an advanced course on hormones and how they reg water/salt homeostasis in our body.	gulate metabolism/growth,	reproduction an
Course Contents	History: discovery of blood borne factor or hormone. Chemical na signaling. Secondary messengers. Responsivity and hormonal effects The hypothalamic pituitary axis The GHRH-GH-IGF axis. The TRH-TSH-thyroid hormone axis. The Catecholamine effects and their pathways. The gastrointestinal system The enteric nervous system. The cephalic phase, stomach phas Regulation of acid secretion. Regulation of pancreatic exocrine and GIP, CCK, secretin, GLP-1, GLP-2 and motilin. Regulation of feeding Insulin and glucagon. Reproduction The GnRH-gonadotropin-sex hormone axis. Regulation of LH and Interaction of hormones produced by various cells in the testis to reg testosterone. The erection reflex. Female reproductive system. Dev cycle: hormonal control: Ovulation, fertilization and implantation. The regulation of parturition. Hormonal control of milk secretion. Prolactin Osmoregulation Posterior pituitary hormone, ADH. Aldosterone and sodium pressure. Atrial natriuretic peptide and its function in water and sodium	<ul> <li>CRH-ACTH-cortisol axis. ( se and intestinal phase of endocrine secretion. Gut g, energy balance and food</li> <li>d FSH release. Male rep gulate spermatogenesis. B relopment of ovarian follicit e placenta as an endocrine and broodiness.</li> <li>balance. Angiotensin's of</li> </ul>	Cortisol and stres of food digestior hormones: gastri intake. productive systen iological actions les. The menstru e organ. Endocrir
Learning Outcomes	On successful completion of this course, students should be able to: - Understand the definition and natures of hormones; - Explain and describe secondary messenger pathways for hormones - Describe the connection between pituitary the master gland with hig - Explain and describe hormones involved in the regulation of second metabolism/growth, reproduction and water/salt homeostasis.	her brain centers and perip	
Pre-requisites	Pass in BIOC1001 or BIOL1125 or BIOL1121 or BIOL1122 or BIOL02	126	

Offer in 2012 - 2013	Not offer	Not offered Examination To be confirme					
Offer in 2013 - 2014	Y	Υ					
Teaching Hours	24 lectu	res; a 3-hour laboratory session per week for 5 weeks					
Assessment Method	One 2-h	ours written paper (80% weighting) and continuous assessment	of laboratory work (20	% weighting)			
Course Grade	A+ to F						
Grade Descriptors	A	Demonstrate thorough mastery at an advanced level of extensive knowledge required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational skills.					
	В	Demonstrate substantial command of a broad range of knowledge required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational skills.					
	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.					
	D	Demonstrate partial but limited command of knowledge required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational skills.					
	Fail	Demonstrate little or no evidence of command of knowledge required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organizational skills are minimally effective or ineffective.					
Textbooks		Williams textbook of Endocrinology, (Elsevier, 11th Edition, 2009). Silverthorn: Human Physiology, An Integrated Approach (Pearson, 2006, 4" edition).					
References	TBC	TBC					
Remarks	The cou	rse will be offered subject to a minimum enrollment number.					

BIOL2210 Evolution	(6 credits)	Academic Year	2012
Offering Department	Biological S	Sciences Quota	50
Course Co-ordinator	Dr M Sun, I	Biological Sciences	
Course Aim	contempora adaptation, The course	s the cornerstone of modern biology. The course aims to introduce students to th ary evolutionary biology, including the history of evolutionary biology, evoluti , speciation, and evolution as an explanatory framework at all levels of biological orga e emphasizes the interplay between theory and empirical tests of hypotheses, thus are pocess of science.	onary processes, inization.
Course Contents	<ul> <li>The relevance of the relevance of the relevance of the relation of th</li></ul>	of evolutionary change ence for evolution as Theory arwin n ern Synthesis & beyond anisms of Evolution n of genetic variation: mutation Irift: evolution at random. election, sexual selection, and adaptation. and Biodiversity	
Learning Outcomes	<ul> <li>be familia</li> <li>be able to</li> <li>lead to spe</li> <li>have an</li> <li>applications</li> </ul>	ar with the facts and theory of evolution; o describe Darwin's theory of evolution by natural selection and how the process of na	
Pre-requisites	Pass in BIC	OL0126 or BIOL0604 or BIOL0625 or BIOL1122 or BIOL1106	
Offer in 2012 - 2013	1st sem	Examination	Dec
Offer in 2013 - 2014	Y		
Teaching Hours	24 hours of	f lectures, 12 hours of tutorials, 12 hours of project and 100 hours of reading/self-stud	ly
Assessment Method		r written examination (50% weighting); continuous assessment (50% weighting, inclu nment, classroom participation and project presentation)	ding quiz, mid-terr
Course Grade	A+ to F		
Grade Descriptors	A	Exceptionally good performance demonstrating excellent understanding of the subject matter, extens wide range of topics covered by the course, and skillful applications of concepts/theories in solving new showing strong abilities in critical thinking and logical reasoning, with evidence of significant insight a dealing with the critical issues in the field.	or unfamiliar problems

	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	Minimally acceptable performance demonstrating at least partial familiarity with the subject matter and some capacity to deal with relatively simple problems, but also demonstrating serious deficiencies in knowledge required for attaining most of the expected course learning outcomes.	
	Fail	Poor performance in all aspects of the course, showing little evidence of learning, lacking real understanding of the subject matter, demonstrating deficiencies serious enough to make it inadvisable to proceed further without additional course work.	
Textbooks	Extbooks Futuyma D.J.: Evolution (Sinauer, 2009, 2nd Ed.) Barton et al: Evolution Scion Publish Ltd. 2007 S. Freeman and J.C. Herron: Evolutionary Analysis (Pearson, 2007, 4th ed.) Ridley, M.: Evolution (Blackwell Publishing, 2004, 3rd ed.) e-book and other websites		
Remarks		to be listed subject to a minimum enrollment number as required by SBS.	

BIOL2215 Animal Ph	ysiology &	Environmental Adaptation (6 credits)	Academic Year	2012				
Offering Department	Biological S	ciences	Quota	50				
Course Co-ordinator	Prof A O L	Wong, Biological Sciences						
Course Aim	habitats. S mechanism	The course covers the major aspects of animal physiology for environmental adaptation in terrestrial & aquation abitats. Stress will be given to the functional interactions between animals and the environment, especially on the nechanisms by which animals obtain resources for survival from the environment, detect environmental changes via sensory structures, and respond to adversities in the environment by altering their body forms & functions.						
Course Contents	metabolism terrestrial h Visual signa & mechanis in aquatic morphologio	asic concepts of animal adaptation to environmental changes/extreme environment; Modification of energy netabolism according to oxygen availability; Different models of gaseous exchange for aquatic, inter-tidal, and errestrial habitats; Cross-adaptation to different environment: air-breathing fish vs diving adaptations in mammals fisual signals & differential levels of photoreception from protozoa to mammals; Background adaptation: functions mechanisms for color presentation; Sound wave as environmental signals: functions & mechanisms of detection aquatic & terrestrial habitats; Echo sounding in bats for navigation without visual signals; Behavioral, norphological & physiological adaptations in hostile environment: extreme hot vs freezing cold; salinity changes ir quatic habitats & water availability in terrestrial habitats on osmoregulation, water balance & nitrogenous netabolism.						
Learning Outcomes	<ul> <li>have a bro</li> <li>appreciate</li> <li>comprehe</li> </ul>	On successful completion of this course, students should be able to: have a broad understanding on functional interactions between animals and their environment appreciate the role of the environment in shaping the evolution of animal structures & functions comprehend a wide range of physiological adaptations (both structurally & functionally) in coping wit environmental stress						
Pre-requisites	Pass in BIC	C1001 or BIOL1125 or BIOL1121 or BIOL1122 or BIOL0126						
Offer in 2012 - 2013	2nd sem		Examination	Мау				
Offer in 2013 - 2014	Y							
Teaching Hours	36 hours of	lectures						
Assessment Method	One 2-hour	written exam (75% weighting) and test & continuous assessment	(25% weighting)					
Course Grade	A+ to F							
Grade Descriptors	A	Demonstrate thorough mastery at an advanced level of extensive knowledge outcomes. Show strong analytical and critical abilities and logical thinking, with ex knowledge to a wide range of complex, familiar and unfamiliar situations. Apply consistently demonstrate informed, thoughtful intellectual engagement with broad	idence of original thought highly effective organization	, and ability to apply ional skills. Writings				
	В	Demonstrate substantial command of a broad range of knowledge required for attaining at least most of the course learn outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar some unfamiliar situations. Apply effective organizational skills. Writings mostly demonstrate informed, thoughtful intellec engagement with broad range of relevant concepts.						
	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 familia 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.			lge to most familiar				
	D	Demonstrate partial but limited command of knowledge required for attaining some of the course learning outcomes. She evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to app knowledge to solve problems. Apply limited or barely effective organizational skills. Writings indicate some intellectu 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.							
Textbooks	(2) C. L. St (3) R. W. H	<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>						
Remarks		will be offered suject to the minimum enrollment number. r to the course website of School of Biological Sciences.						

BIOL2218 Human pl	nysiology (	6 credits)	Academic Year	2012				
Offering Department	Biological	Sciences	Quota	120				
Course Co-ordinator	Dr W Y Lui	i, Biological Sciences						
Course Aim	completing	e covers major aspects of the physiology of the human bod this course, students will have acquired fundamental princip in nutrition and human biology will find this course most useful.						
Course Contents	physiology system; Th	Overview of the physiological systems and homeostasis; Neural and hormonal communication; Nervous system physiology; The digestive system; Cardiac physiology, the blood vessels and blood pressure; The respiratory system; The urinary system; The skeletal & muscular system; Sensory mechanisms; Biological rhythms; Centra peripheral communication in energy homeostasis.						
Learning Outcomes	- Compreh internal en - Understa	sful completion of this course, students should be able to: eend the essence of how the body meets changing conditions vironment nd the functions of various body systems ormal body functions through integration of basic physiologic cor	C C	elatively constant				
Pre-requisites	Pass in Bl	OL1122 or BIOL0126						
Offer in 2012 - 2013	1st sem		Examination	Dec				
Offer in 2013 - 2014	Y	Y						
Teaching Hours	36 hours le	ectures						
Assessment Method	One 2.5-ho	our written exam (70% weighting) and continuous assessment (3	0% weighting)					
Course Grade	A+ to F							
Grade Descriptors	A Demonstrate thorough mastery at an advanced level of extensive knowledge required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective 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.							
	С	Show evidence of some analytical and critical abilities and logical thinking,						
	C D	Show evidence of some analytical and critical abilities and logical thinking,	and ability to apply knowle g some of the course learr ind critical abilities. Show li	edge to most familiar				
		Show evidence of some analytical and critical abilities and logical thinking, situations. Apply moderately effective organizational skills. Demonstrate partial but limited command of knowledge required for attaining evidence of some coherent and logical thinking, but with limited analytical a	and ability to apply knowle g some of the course learn and critical abilities. Show li skills. attaining the course learnin	adge to most familiar ning outcomes. Show mited ability to apply g outcomes. Lack of				
Textbooks	D Fail Silverthorm Sherwood Fox S.I. Hu Johnson M Siegel G. J	Show evidence of some analytical and critical abilities and logical thinking, situations. Apply moderately effective organizational skills. Demonstrate partial but limited command of knowledge required for attaining evidence of some coherent and logical thinking, but with limited analytical a knowledge to solve problems. Apply limited or barely effective organizational s Demonstrate little or no evidence of command of knowledge required for a analytical and critical abilities, logical and coherent thinking. Show very little or	and ability to apply knowled g some of the course learn and critical abilities. Show li skills. attaining the course learnin r no ability to apply knowled 008)	adge to most familiar ning outcomes. Show mited ability to apply g outcomes. Lack of				
Textbooks	D Fail Silverthorm Sherwood Fox S.I. Hu Johnson M Siegel G. J	<ul> <li>Show evidence of some analytical and critical abilities and logical thinking, situations. Apply moderately effective organizational skills.</li> <li>Demonstrate partial but limited command of knowledge required for attaining evidence of some coherent and logical thinking, but with limited analytical a knowledge to solve problems. Apply limited or barely effective organizational science of some coherent and logical thinking, but with limited analytical a snowledge to solve problems. Apply limited or barely effective organizational science of command of knowledge required for attaining evidence of some coherent and logical thinking. Show very little or Organizational skills are minimally effective or ineffective.</li> <li>D. U.: Human Physiology: An integrated Approach (Pearson, 2001) Juman Physiology (McGraw Hill, 2009)</li> <li>D.: Human Biology (Pearson, 2006)</li> <li>J. et al.: Basic Neurochemistry (Academic Press, 2006)</li> </ul>	and ability to apply knowled g some of the course learn and critical abilities. Show li skills. attaining the course learnin r no ability to apply knowled 008)	adge to most familiar ning outcomes. Show mited ability to apply g outcomes. Lack of				

BIOL2301 Protein st	ructure and function (6 credits)	Academic Year	2012
Offering Department	Biological Sciences	Quota	150
Course Co-ordinator	Dr W K Yip, Biological Sciences		
Course Aim	To provide students with a good understanding of protein structure, how st methods for study of both. This course provides a strong foundation for ad biotechnology.		
Course Contents	The course will include: Elements of structure: sequencing, prediction and de structures; Methods for determination of structure: X-ray crystallogr ultracentrifugation and several hydrodynamic methods for determination of r and function: molecular motifs, recognition and binding, evolution, natural kinetics and energetics of binding, transition state and molecular mechanisms characterization: various liquid chromatographical methods, methods of dete weights; Applications: drug design and antibody design, protein stability.	aphy, various op nolecular size and and artificial mutar of catalysis; Protei	otical methods, shape; Structure nts; Enzymology n purification and
Learning Outcomes	On successful completion of this course, students should be able to: - design assaying methods for enzymes - find out kinetic parameters of proteins or enzymes by graphically techniques - learn about the ways to purify protein and the many industrial uses of protein	s	
Pre-requisites	Pass in BIOC1001 or BIOL1125 or BIOL1122 or BIOL0126		
Offer in 2012 - 2013	2nd sem	Examination	Мау
Offer in 2013 - 2014	Y		
Teaching Hours	24 lectures and 12 hours of tutorials (to be arranged)		

Assessment Method	One 2.5-hour written examination (70% weighting) and continuous assessment (30% weighting)							
Course Grade	A+ to F	A+ to F						
Grade Descriptors	A	Exceptionally good performance demonstrating comprehensive understanding of the subject matter; Critical insight into the scientific literature; Superior writing and group communication skills.						
	В	Good performance demonstrating full understanding of the subject matter; Coherent insight into the scientific literature; Good writing and group collaboration skills.						
	С	Satisfactory performance demonstrating adequate understanding of the subject matter; Some insight into the scientific literature; Adequate writing and group collaboration skills.						
	D	Limited performance demonstrating some understanding of basic subject matter; Some ability to use the scientific literature; Limited writing and group collaboration skills.						
	Fail	Poor understanding of subject matter; Little to no insight into use of the scientific literature; Unable to write or collaborate.						
Textbooks	None prescribed							
References	To be an	To be announced.						
Remarks	The cour	se will be offered subject to a minimum enrollment number.						

BIOL2302 Fermenta	tion techno	logy (6 credits)	Academic Year	2012					
Offering Department	Biological S	Sciences	Quota	60					
Course Co-ordinator	TBC, Biological Sciences								
Course Aim		te the key concepts and principles involved in fermentation teo is used in the food and biotechnology industries.	chnology, and discus	s how fermentation					
Course Contents	maintenance medium province various ferr	isms involved in fermentation, fermentation kinetics and mode be, biosynthesis of primary and secondary metabolites, sub eparation, product recovery and purification, modes of cultiva nentation processes such as beer, soy sauce, lactic acid, yoght , single cell protein, pharmaceuticals, pigments, etc.	strate utilization, inhation. Application of	hibitory substrates these principles to					
Learning Outcomes	<ul> <li>understan</li> <li>understan</li> <li>understan</li> <li>understan</li> </ul>	sful completion of this course, students should be able to: d diversity of microorganisms used in fermentation d how to isolate, screen and maintain cultures d basic calculation using mass balance and stoichiometry d fermentation kinetics and mathematical modelling d various modes of cultivation							
Pre-requisites	Pass in BIC	0L1122 or BIOL0126 or BIOL1123 or BIOL1528 or BIOL0129 or	BIOL0135						
Offer in 2012 - 2013	Not offered		Examination	To be confirmed					
Offer in 2013 - 2014	N								
Teaching Hours	24 lectures	; 24 hours of laboratory/tutorials/seminars/field-trip							
Assessment Method	One 2-hour (25% weigh	r written paper (75% weighting); continuous assessment of lainting)	boratory work, projec	t and assignments					
Course Grade	A+ to F								
Grade Descriptors	A								
	В								
	С								
	D								
	Fail								
Textbooks	TBC								
References	<ul> <li>H. W. Doelle: Microbial Process Development (World Scientific, 1994)</li> <li>P. F. Stanbury et al.: Principles of Fermentation Technology (Pergamon, 1995)</li> <li>C. Ratledge and B. Kristiansen: Basic Biotechnology (Cambridge, 2001)</li> </ul>								
	na enouy e	K. Shetty et al.: Food Biotechnology (Taylor & Francis, 2006, 2nd edition)							

BIOL2303 Molecular	Academic Year	2012				
Offering Department	Biological Sciences	Quota	80			
Course Co-ordinator	Prof B K C Chow, Biological Sciences					
Course Aim	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	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.					
Learning Outcomes	On successful completion of this course, students should be able to:					

	<ul> <li>Underst translation</li> <li>Explain a</li> <li>Demons</li> </ul>	basic structures of DNA, RNA and and the biochemical processes al modifications in prokaryotes and nd describe the regulation of gene rate knowledge and understandi including PCR, site-directed muta	involved in DNA replication leukaryotes. transcription in prokaryotes and ng of the underlying concept	on, transcription, trar	slation and post-		
Pre-requisites	Pass in Bl	OL1121 or BIOL1122 or BIOL0126	or BIOL0129 or BIOL0135 o	r BIOL1125			
Offer in 2012 - 2013	1st sem	2nd sem		Examination	Dec May		
Offer in 2013 - 2014	Y						
Teaching Hours	24 lectures	s, 5 x 4-hours laboratory sessions					
Assessment Method	One 2-hou	r written examination (70% weight	ing), mid-term quiz and asses	ssment of practical wor	k (30% weighting)		
Course Grade	A+ to F						
Grade Descriptors	A	Demonstrate thorough mastery at an advanced level of extensive knowledge required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective lab skills and techniques. Critical use of data and results to draw appropriate and insightful conclusions. Apply highly effective organizational and presentational skills.					
	В	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 co analytical and critical abilities, logical and Apply minimally effective or ineffective la conclusions. Organization and presentat	d coherent thinking. Show very little ab skills and techniques. Misuse of c	or no ability to apply knowled lata and results and/or unab	ge to solve problems.		
Textbooks	J. Watson B. Lewin: 0	: Molecular Biology (McGraw-Hill, et al.: Molecular Biology of the Ge Gene IX (Jones and Bertlett, 2008) purnal articles and web learning ma	ne (Benjamin Ćummings, 200	)4)			
References	TBC						
Remarks	The course	will be offered subject to a minim	num enrollment number.				

BIOL2318 Biologica	l sciences	field course (6 credits)	Academic Year	2012					
Offering Department	Biological	Sciences	Quota	20					
Course Co-ordinator	Dr L Karcz	Dr L Karczmarksi, Biological Sciences							
Course Aim		e is offered as an experiential learning experience and will rec side or outside Hong Kong.	uire intense study of a	topic during a field					
Course Contents	suit the top contents w	r a number of different potential courses may be offered. The pic and locality involved and will therefore vary according to to vill involve lectures, seminars and extensive field and follow ontact the course coordinator for further information on the course	he specific course bei -up laboratory work.	ng held. The basic					
Learning Outcomes	- Have an - Have esta - Be knowl studied. - Understa	sful completion of this course, students should be able to: understanding of the biodiversity and primary habitats in the er ablished the basic skills needed to identify target species asso ledgeable about and able to implement sampling techniques f nd the basic ecology of target species and how biotic and abio of the relationships between humans and the species and ha	ciated with the field cou or organisms in the pa tic factors shape focal	rticular ecosystems					
Pre-requisites	Students a specific co	re expected to have successfully completed their first year. T urse.	he pre-requisites will va	ary according to the					
Offer in 2012 - 2013	Summer		Examination	No Exam					
Offer in 2013 - 2014	Y								
Teaching Hours		of formal and student centered learning. Residential field trip d aks. Note students will have to pay for their own travel a d).							
Assessment Method	Continuou	s Assessment, exams and small project work (100%)							
a	A+ to F								
Course Grade									

	В	Evidence of a good grasp of the subject and relevant research techniques. Interest in learning and good-to-moderate familiarity with relevant background reading and case studies. Good handling of field data collection and commendable analytical skills. Good evidence of critical thought (although not always independent), with an appreciable use of fundamental concepts and consideration of broader comparative perspective in drawing logical conclusions. Good abilities of independent work, effective presentation skills with logical and analytical argumentation. Work more than sufficient for what is required at degree level.
	с	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.
Textbooks	Students w	vill be directed to relevant scientific literature and websites.
References	TBC	
Remarks	Subclass E Subclass ( Sublcalss http://www Students a specific co	A: Marine Mammal Field Course (Course Coordinator: Dr L Karczmarski) 3: Marine Life Science: a North East Pacific perspective (Course Coordinator - Dr V Thiyagarajan) 2: Sustainable Food Production (Course Coordinator - Dr H S El-Nezami) D: Animal Behaviour Field Course (Course Coordinator - Dr L Karcsmarski) .biosch.hku.hk/ecology/lsc/biol2318/ re expected to have successfully completed their first year. The pre-requisites will vary according to the urse. Please contact the course coordinator for details. a will be offered subject to a minimum enrollment number.

BIOL2320 Directed	studies in b	iological sciences (6 credits)	Academic Year	2012					
Offering Department	Biological S	Sciences	Quota	50					
Course Co-ordinator	Dr M Sun, I	Dr M Sun, Biological Sciences							
Course Aim		vill undertake a dissertation on an agreed topic or carry out The student will develop scientific writing and presentation skills.	a small scale pro	ject in biologica					
Course Contents	student's u of the diss various tec	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. The student should obtain the commitment of a supervisor, decide on a title of the dissertation or project, and then seek approval from the course coordinator. Supervisors will introduce various techniques and guide students to complete their dissertation or project. Teaching will be informal and students will gain knowledge through discussion and feedback from the supervisor.							
Learning Outcomes	- Be acqua scientific st - Be able to	sful completion of this course, students should be able to: ainted with the process of science, and develop the key intellec udies o apply scientific methods to address important issues in various b etter understanding of the nature of biological sciences		e valuable for a					
Pre-requisites	Pass in at I	east 18 credits of any BIOLXXXX courses; and Cumulative GPA	of 2.7 or above						
Offer in 2012 - 2013	Year long		Examination	No Exam					
Offer in 2013 - 2014	Y								
Teaching Hours	and on hov	eetings between the supervisor and student. Guidance from the v to think and write scientifically. Students should spend at least nded reading may be assigned.	•						
Assessment Method		ion or project report of approximately 6,000 - 8,000 words mus presentation/examination will also be required (20% weighting).	t be submitted (80%	5 weighting); a 2					
Course Grade	A+ to F								
Grade Descriptors	A	Work displaying a high level of scholarship and originality; virtually flawles dissertation topic, showing a thorough grasp of the topic from background objectives of the research; comprehensive exploration of the topic, personal sy the literature; comprehensive and up-to-date references integrated into argum the main points or problems and their solutions and implications; thought-p chapters/paragraphs are well-connected and presented logically with clarity of rhetorical and presentational skills. The length of the dissertation meet the sp dissertation conform to a high academic standard.	reading and analysis; cle thesis of the issues with ent or logical reasoning; rovoking discussions; ac goals, demonstrating exc	ear statement of the detailed support from critical evaluations o curate summary. Al cellent organizational					
	В	B Work showing some evidence of originality and insight in identifying, generating and communicating competing arr perspectives or problem solving approaches; demonstrating substantial understanding of fundamental concepts of th study; adequate grasp of the topic from background reading and analysis; a systematic exploration of the topic wi include an attempt at critical comment or appraisal; regular support provided from the literature; comprehensive and u references included; main points fully elaborated; summary given in the final chapter/paragraphs; communicating in and ideas clearly and fluently, demonstrating good organizational, rhetorical and presentational skills. The lengt 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 point presented in legically acquired and acknowledged; the main							
	D	Demonstrating superficial or partial or faulty understanding of the fundamental of minimum of information, poorly digested and not very well organized in present of critical thinking; arguments undeveloped or inappropriate or unsupported; information or ideas. dissertation topic not fully covered; discussion too brief of the second	ation; irrelevant material; lack of clarity or structu	showing no evidence ire in communicatin					

	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	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.

BIOL2324 Microbial	physiolog	ogy an	nd bioche	mistry (6	5 cred	its)			/	Academic Year	2012
Offering Department	Biological	al Scier	ences						C	Quota	60
Course Co-ordinator	Dr A X Ya	ran, Bio	iological Sci	ences							
Course Aim	mycology students cells. Afte	y, virol to ob fter con	ology, immu obtain a pro ompleting thi	inology, ai ofound und s course, s	nd me derstan student	dical, foo iding on s will hav	od and i the cor re acquir	ndustrial mi istituents, n ed fundame	icrobiolo netaboli ntal prir	sciplines of micro ogy. This course sms, and function nciples of microbi icroorganisms.	is designed for ons of microbia
Course Contents										of the prokaryoti trol of metabolic a	
Learning Outcomes	<ul> <li>Apprecia</li> <li>Compre</li> <li>Relate k</li> </ul>	In successful completion of this course, students should be able to: 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.							3.		
Pre-requisites		ass in BIOL0129 or BIOL0135 or BIOL0120 or BIOL1120; and ass in BIOL2111 or BIOL2303, or already enrolled in either course.									
Offer in 2012 - 2013	1st sem	1st sem						E	Examination	Dec	
Offer in 2013 - 2014	Y										
Teaching Hours	36 hours	s lectur	ires including	g in-class t	utorials	6					
Assessment Method	One 2-ho	our writ	ritten examir	ation (50%	% weigł	nting) and	l continu	ous assessr	ments (8	50% weighting)	
Course Grade	A+ to F										
Grade Descriptors	A Demonstrate thorough mastery at an advanced level of extensive knowledge required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective 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	evid		e coherent a	and logica	al thinking,	but with li	mited analytica	and crit	e of the course learn ical abilities. Show lin	
	Fail Demonstrate little or no evidence of command of knowledge required for attaining the course learning outcomes. La analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve proto Organizational skills are minimally effective or ineffective.										
Textbooks	published On-line te	Prescott's Principles of Microbiology, by Joanne M. Willey, Linda M. Sherwood, and Christopher J. Woolverton published by McGraw-Hill On-line textbook of Bacteriology: Kenneth Tobar, U. of Wisconsin-Madison, Department of Bacteriology. URL (http://www.textbookofbacteriology.net/)									
References	TBC										
Remarks	The cours										

BIOL2503 Grain pro	BIOL2503 Grain production & utilization (6 credits)						
Offering Department	Biological Sciences Quota 40						
Course Co-ordinator	Dr H Corke, Biological Sciences						
Course Aim	To provide a broad understanding of the utilization and significance of the m human health and nutrition.	ajor grains in the foo	od industry and in				
Course Contents	<ul> <li>Global grain production and consumption</li> <li>The Green Revolution and its aftermath</li> <li>International grain trade</li> <li>Wheat: flour milling, dough rheology, the baking process, baking quality</li> <li>Wheat: quality of Asian products including steamed bread and noodles</li> <li>Wheat: small-scale tests for quality</li> <li>Rice: nutritional quality, consumer preferences, milling, quality, quality testir</li> <li>Maize: products of wet milling, animal feed development</li> <li>Biofuels focusing on bioethanol</li> <li>Illustrative business case studies on the grain processing industry will be discussed.</li> </ul>						
Learning Outcomes	On successful completion of this course, students should be able to: - Understand the major production, import, and export patterns that support t	he global utilization c	of grain				

	- Understa - Apprecia	<ul> <li>Understand the technology behind the production of grain-based foods</li> <li>Understand the scope and nature of professional level quality testing for grain products</li> <li>Appreciate the constraints to global food sufficiency</li> <li>Appreciate the ethical issues behind the diversion of grain into meat and biofuel production</li> </ul>					
Pre-requisites	Pass in Bl	Pass in BIOL0002 or BIOL1122 or BIOL1528					
Offer in 2012 - 2013	1st sem	1st sem Examination Dec					
Offer in 2013 - 2014	Y						
Teaching Hours	24 lecture	es and 30 ho	urs practicals labo	oratory and 6 hou	urs seminars/presen	tations	
Assessment Method	One 2-hou	ur written exa	amination (70% w	veighting) and pro	oject and presentation	on (30% weighting)	
Course Grade	A+ to F	A+ to F					
Grade Descriptors	A	A Demonstrate thorough grasp of the subject matter covered. Show strong analytical and critical abilities and logical thinking, with evidence of creative ability and competence in professional-level problem solving. Critically use lab skills and techniques and analysis of data and results to draw appropriate and insightful conclusions to real-world problems. Demonstrate highly effective team-based organizational and presentational skills.					
	В	B Demonstrate substantial grasp of the subject matter covered. Show evidence of analytical and critical abilities and logical thinking with some evidence of competence in professional-level problem solving. Use lab skills and techniques and analysis of data and results to draw generally appropriate conclusions to real-world problems. Demonstrate effective team-based organizational and presentational skills.					
	с	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 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.						
Textbooks			n Science', edited		Corke H, and Walk	er CE (2004) 3 Volu	mes, 1,700 pages.
References	TBC						
Remarks	The cours	se will be offe	ered subjected to	a minimum enrol	lment number.		

BIOL2507 Meat and	dairy scien	ice (6 credits)	Academic Year	2012			
Offering Department	Biological S	Sciences	Quota	50			
Course Co-ordinator	Prof N P SI	hah, Biological Sciences					
Course Aim		To give students a broad understanding of modern practice and technologies used in meat and dairy production processing and marketing.					
Course Contents	carcass in	Principles of animal nutrition and feed formulation; genetic selection and breeding of farm animals; slaughter and carcass inspection; meat preservation and safety; sensory quality of meat. Dairy processing emphasizing fermented products such as cheese and yogurt; probiotics and health effects. Meat and dairy product marketing.					
Learning Outcomes	- Understar - Demonstr processing	On successful completion of this course, students should be able to: - Understand modern practices in meat and dairy production; - Demonstrate a knowledge and understanding of meat and dairy sensory quality, and the technologies used in processing, preservation or improvement of meat and dairy products; - Demonstrate knowledge of selected issues related to meat and dairy safety.					
Pre-requisites	Pass in BIC	DL0002 or BIOL1122 or BIOL0126 or BIOL1123 or BIOL1528					
Offer in 2012 - 2013	2nd sem		Examination	May			
Offer in 2013 - 2014	Y						
Teaching Hours	24 lectures	; 24 hours of laboratory/tutorials					
Assessment Method	One 2-hou	r written examination (80% weighting); continuous assessment	of practical work (20%	weighting)			
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 o 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.						
	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.						
		Demonstrate little or no grasp, with retention of little relevant information, of t and logical thinking, and minimal competence in professional-level problem s					

	Fail 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.			
Textbooks	Lawrie's Meat Science. RA Lawrie (CRC Press, 2006) Dairy Processing and Quality Assurance. RC Chandan, A Kilara, N Shah (Eds) (Blackwell, 2008)			
References	TBC			
Remarks	The course will be offered subjected to a minimum enrollment number.			

	robiology (6 credits)						
Offering Department	Biological	Biological Sciences Quota 75					
Course Co-ordinator	Dr H S El-	Dr H S El-Nezami, Biological Sciences					
Course Aim	special em	This course provides the key concepts and principles of food microbiology with special emphasis on the interaction between microorganisms and food., microbial food spoilage and foodborne diseases will be discussed in detail.					
Course Contents	in foods, S	Detection and enumeration of microbes in foods, Factors that influence microbes in foods, Spores and their significance, Physical methods of food preservation, Chemical preservation and natural antimicrobials, Foodborne pathogens.					
Learning Outcomes	<ul> <li>Describe</li> <li>Demonst</li> <li>response of</li> <li>Develop</li> <li>pathogenio</li> <li>Demonst</li> </ul>	On successful completion of this course, students should be able to: - Describe methods for evaluating microorganisms and their products in foods. - Demonstrate an understanding of the causes of food spoilage, and predict response of a microorganism that can spoil a given food. - Develop and implement appropriate measures to control the spoilage and pathogenic microorganisms in a food. - Demonstrate the ability to work in a team to investigate and solve problems in food microbiology					
Pre-requisites	Pass in Bl	IOL0002 or	BIOL1123 or BIOL1528 or BIOL0129	or BIOL0135			
Offer in 2012 - 2013	2nd sem				Examination	Мау	
Offer in 2013 - 2014	Y						
Teaching Hours	24 hours le	ectures; 12	nours tutor; 24 hours laboratory and	40 hours reading/se	elf-study		
Assessment Method		our written e v report (20%	kamination (40% weighting); semin weighting)	ars and continuou	s assessment (409	% weighting) and	
Course Grade	A+ to F						
Grade Descriptors	A	with eviden and analysi	e thorough grasp of the subject matter cover e of creative ability and competence in profe s of data and results to draw appropriate an m-based organizational and presentational sk	essional-level problem s id insightful conclusions	olving. Critically use lab	skills and techniques	
	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.					sheetive team-based	
	С	abilities and analysis of	e general but incomplete grasp of the subje logical thinking with limited competence in p data and results to draw moderately approp	professional-level proble priate but sometimes er	m solving. Use lab skills roneous conclusions to	analytical and critica s and techniques and	
	C D	abilities and analysis of Demonstrat evidence of techniques	e general but incomplete grasp of the subje logical thinking with limited competence in p data and results to draw moderately approp	professional-level proble priate but sometimes er ponal and presentational so pome relevant informatio pompetence in professio pometimes appropriate b	m solving. Use lab skills roneous conclusions to skills. n, of the subject matter nal-level problem solvin ut often erroneous cond	analytical and critica s and techniques and real-world problems covered. Show some g. Use lab skills and	
		abilities and analysis of Demonstrat evidence oi techniques problems. D Demonstrat and logical of data and	a general but incomplete grasp of the subje logical thinking with limited competence in p data and results to draw moderately approp e moderately effective team-based organizatic partial but limited grasp, with retention of sc coherent and logical thinking, but lacking co and analysis of data and results to draw so	rofessional-level proble riate but sometimes er onal and presentational i ome relevant informatio ompetence in professio metimes appropriate but resentational skills of lim ant information, of the s onal-level problem solvir appropriate and usually e	m solving. Use lab skills roneous conclusions to skills. n, of the subject matter nal-level problem solvin ut often erroneous cond lited effectiveness. ubject matter covered. S ng. Use lab skills and tec rroneous conclusions to	analytical and critica s and techniques and real-world problems covered. Show some g. Use lab skills and clusions to real-world Show lack of coheren chniques and analysi	
Textbooks	D Fail 1. Food M	abilities and analysis of Demonstrat Demonstrat evidence of techniques problems. I Demonstrat and logical of data and Demonstrat	a general but incomplete grasp of the subje logical thinking with limited competence in p data and results to draw moderately approp e moderately effective team-based organization e partial but limited grasp, with retention of so coherent and logical thinking, but lacking co- and analysis of data and results to draw so emonstrate team-based organizational and pr little or no grasp, with retention of little relev- hinking, and minimal competence in profession results ineffectively, leading generally to inag	professional-level proble priate but sometimes er noal and presentational : ome relevant informatio ompetence in professio ometimes appropriate bi resentational skills of lim ant information, of the s onal-level problem solvir oppropriate and usually e and presentational skills.	m solving. Use lab skills roneous conclusions to skills. n, of the subject matter nal-level problem solvin ut often erroneous cond lited effectiveness. ubject matter covered. S ng. Use lab skills and tec rroneous conclusions to	analytical and critica s and techniques and real-world problems covered. Show some g. Use lab skills and clusions to real-world Show lack of coheren chniques and analysi	
Textbooks	D Fail 1. Food M Matthews, 2. Food M Doyle, Lar	abilities and analysis of Demonstrat evidence of techniques problems. I Demonstrat and logical of data and Demonstrat licrobiology: rry R. Beuch	a general but incomplete grasp of the subje logical thinking with limited competence in p data and results to draw moderately approp a moderately effective team-based organization a partial but limited grasp, with retention of so coherent and logical thinking, but lacking co- and analysis of data and results to draw so emonstrate team-based organizational and pr e little or no grasp, with retention of little relev inking, and minimal competence in professic results ineffectively, leading generally to inap ineffectiveness team-based organizational and An Introduction, 2005, Thomas J. Moderation of the subject in the subject of the subject of the subject of the subject in the subject of the subject of the subject of the subject in the subject of the subject of the subject of the subject in the subject of the subject of the subject of the subject in the subject of the subject of the subject of the subject of the subject in the subject of	rofessional-level proble rriate but sometimes er onal and presentational : ome relevant informatio ompetence in professio metimes appropriate bi resentational skills of lim ant information, of the s onal-level problem solvir popropriate and usually e ind presentational skills.	m solving. Use lab skills roneous conclusions to skills. n, of the subject matter nal-level problem solvin ut often erroneous cond lited effectiveness. ubject matter covered. S ng. Use lab skills and teo rroneous conclusions to	analytical and critica s and techniques and real-world problems covered. Show some g. Use lab skills and clusions to real-world Show lack of coheren chniques and analysi	
Textbooks	D Fail 1. Food M Matthews, 2. Food M Doyle, Lar	abilities and analysis of Demonstrat evidence of techniques problems. I Demonstrat and logical of data and Demonstrat licrobiology: rry R. Beuch	a general but incomplete grasp of the subje logical thinking with limited competence in p data and results to draw moderately approp e moderately effective team-based organization e partial but limited grasp, with retention of sc coherent and logical thinking, but lacking co emonstrate team-based organizational and pr e little or no grasp, with retention of little relev- ninking, and minimal competence in profession results ineffectively, leading generally to inage e ineffectiveness team-based organizational and and nature to the state of the state of the state of the state information of the state of the state of the state of the state of the state of the state of the state of the state of the state e ineffective of the state of the state of the state of the state of the state of the state of the state of the state of the state e ineffective of the state of the state of the state of the state of the state of the state of the state of the state of the state e ineffective of the state of the	rofessional-level proble rriate but sometimes er onal and presentational : ome relevant informatio ompetence in professio metimes appropriate bi resentational skills of lim ant information, of the s onal-level problem solvir popropriate and usually e ind presentational skills.	m solving. Use lab skills roneous conclusions to skills. n, of the subject matter nal-level problem solvin ut often erroneous cond lited effectiveness. ubject matter covered. S ng. Use lab skills and teo rroneous conclusions to	analytical and critica s and techniques and real-world problems covered. Show some g. Use lab skills and clusions to real-world Show lack of coherer chniques and analysi	

BIOL2530 Molecular biology and nutrigenomics (6 credits) Academic			2012	
Offering Department	Biological Sciences Quota 80			
Course Co-ordinator	Dr K C Tan-Un, Biological Sciences			
Course Aim	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			

	nutrigenetic	CS.					
Course Contents	biochemistr Regulation relation to c Overview o hyperlipidad Relevance polymorphis Epigenetics gene expre leptin, FTO Polyunsatu example lip Inborn error	Concepts of nutrigenomics, nutrigenetics, metabolomics and nutritional biochemistry. Regulation of gene expression; Single Nucleotide Polymorphisms and relation to diseases. Overview of lipid metabolism; cholesterol metabolic pathway; hyperlipidaemia, LDL receptor mutations. Relevance of folate, vitamin B12; hyperhomocysteinemia and gene polymorphisms in diseases. Epigenetics, Barker s hypothesis, influence of maternal nutrition in fetal gene expression. Obesity, genetic predisposition, candidate genes like leptin, FTO and other hormones involved in the control of appetite Polyunsaturated fatty acid and their roles in the control of gene expression example lipogenesis and lipid oxidation pathways; Inborn errors of metabolism in the context of genetic mutations and personalized diet therapy					
Learning Outcomes	<ol> <li>explain th</li> <li>demonst</li> <li>discuss h</li> <li>nutrient-relationsh</li> <li>explain th</li> <li>diseases;</li> <li>critically</li> </ol>	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 in relationship to diet, gene expression and disease 3. discuss how genetic variations are used to study the role of genes in nutrient-related cellular processes 4. explain the relationship between genotype, epigenetics and diet-related diseases; 5. critically evaluate current theories of personalized nutrition based on individual genetic variation.					
Pre-requisites	Pass in BIC	DC1001 or BIOL1125 or BIOL1106					
Offer in 2012 - 2013	1st sem		Examination	Dec			
Offer in 2013 - 2014	Y						
Teaching Hours	24 hours of	i lectures and 12 hours of student-centered learning					
Assessment Method	One 2-hou weighting)	r written examination (60% weighting), a mid-term test (20%	6 weighting) and	coursework (20%			
Course Grade	A+ to F						
Grade Descriptors	A Demonstrate thorough grasp of the subject matter covered. Show extensive ability of knowledge integration and problem solving skills. Show excellent ability to critically analyze and interpret complex scientific data and draw appropriate conclusions. Demonstrate highly effective organization and writing skills. Demonstrate substantial grasp of the subject matter covered. Show substantial ability of knowledge integration and problem						
	B solving skills. Show substantial ability to critically analyze and interpret scientific data and draw appropriate conclusions. Demonstrate effective organization and writing skills.						
	C Demonstrate general and acceptable grasp of the subject matter covered. Show acceptable ability of knowledge integration and problem solving skills. Show moderate ability to analyze and interpret scientific data and draw proper conclusions. Demonstrate moderate organization and writing skills.						
	D	Demonstrate marginal grash of the subject matter covered. Show limited ability on knowledge integration and problem solving					
		skills. Onew inflied ability to analyse and interpret scientific data. Demonstrate be	•	iang biano.			
	Fail	Demonstrate little or no grasp, with little retention of information of the subject logical thinking, and minimal evidence in problem solving. Fail to integrate informinimal ability to analyze and interpret scientific data and draw conclusions. Dem	t matter covered. Show	lack of coherent and oblems. Show little or			
Textbooks	Lehninger F Ordovas: N Brigelius-FI Rimbach, F	Demonstrate little or no grasp, with little retention of information of the subjec logical thinking, and minimal evidence in problem solving. Fail to integrate info	t matter covered. Show	lack of coherent and oblems. Show little or			
Textbooks References	Lehninger F Ordovas: N Brigelius-FI Rimbach, F	Demonstrate little or no grasp, with little retention of information of the subject logical thinking, and minimal evidence in problem solving. Fail to integrate informinimal ability to analyze and interpret scientific data and draw conclusions. Dem Principles of Biochemistry lutrigenetics and Nutrigenomics. Wiley. 2004 lohe, Joost: Nutritional Genomics. Wiley. 2006. Fuchs, Packer: Nutrigenomics, CRC Press. 2005	t matter covered. Show	lack of coherent and oblems. Show little or			

BIOL2532 Diet and o	BIOL2532 Diet and disease (6 credits) Academic Year 201				
Offering Department	Biological Sciences	Quota	75		
Course Co-ordinator	Dr J M F Wan, Biological Sciences				
Course Aim	<ul> <li>This course aims to provide understanding and insight into disease with diet and basic dietetics, specifically to:</li> <li>1. Explain the relationships between diet and disease.</li> <li>2. Describe the role of diet in the development and prevention of c chronic diseases such as diabetes, obesity and anorexia, cardiova cancer, immune deficiency and renal failure.</li> <li>3. Differentiate risk factors that influence dietary choice.</li> <li>4. Describe the rationales for postoperative nutritional support for patients.</li> </ul>	common ascular disease,			
Course Contents	The basics of nutrition for health and fitness and medical nutrition role of diet in the development and prevention of chronic diseases cancer, diabetes, obesity and anorexia as well as bulimia nervosa diseases, renal failure, etc. Malnutrition. Nutrition and immune fun Medical nutrition therapy for food allergy and food intolerance. Nut pregnancy and lactation.	such as , cardiovascular ction.			

Learning Outcomes	<ul> <li>Upon successful completion of this course, students should be able to:</li> <li>1. Discuss the different relationships between diet and disease.</li> <li>2. Describe the role of diet in the development and prevention of diabetes, obesity and anorexia, cardiovascular disease, cancer, immune deficiency, and renal failure.</li> <li>3. Clearly differentiate and interpret risk factors that influence dietary choice.</li> <li>4. Describe the rationales for postoperative nutritional support for hospitalized patients.</li> </ul>						
Pre-requisites	Pass in BI	DL1514					
Offer in 2012 - 2013	2nd sem	2nd sem Examination May					
Offer in 2013 - 2014	Y						
Teaching Hours	24 hours le	ectures, 24 hours laboratory sessions, 12 tutorials, 40 hours Readin	g/Self-study				
Assessment Method	One 2-hou	r written examination (60% weighting), test (20% weighting) and ora	al presentation (20%	6 weighting)			
Course Grade	A+ to F						
Grade Descriptors	A	Demonstrate thorough mastery at an advanced level of extensive knowledge at learning outcomes. Thorough grasp of the subject. Show strong analytical ar evidence of original thought, and ability to apply knowledge to a wide range o Apply highly effective organizational and presentational skills. Apply highly effect Critical use of data and results to draw appropriate and insightful conclusion presentational skills.	nd critical abilities and f complex, familiar and ive laboratory/fieldwork	logical thinking, with unfamiliar situations. skills 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. 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	C bemonstrate 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 attr Partial but limited grasp of the subject, retention of some relevant information of a nd logical thinking, but with limited analytical and critical abilities. Show limited Apply limited or barely effective organizational and presentational skills. Apply techniques. Limited ability to use data and results to draw appropriate cor organizational and presentational skills.	he subject. Show evide ability to apply knowled partially effective lab	nce of some coherent ge to solve problems. / fieldwork skills and			
	Fail	Demonstrate little or no evidence of command of knowledge and skills required. Little or no grasp of the knowledge and understanding of the subject. Lack of coherent thinking. Show very little or no ability to apply knowledge to solve proble minimally effective or ineffective. Apply minimally effective or ineffective laborato data and results and/or unable to draw appropriate conclusions. Organization and or ineffective.	of analytical and critical ms. Organization and pr ry / fieldwork skills and t	abilities, logical and esentational skills are echniques. Misuse of			
Textbooks	S. Rodwell Nutrition: P	eadings will also be available on the class website. Williams: Nutrition and Diet Therapy (7th ed.) Suitor & Hunter: Principles and Application in Health Promotion Wardlaw Gordon: es in Nutrition (2nd ed.)					
References	TBC						
Remarks	The course	will be offered subject to a minimum enrollment number.					

BIOL2533 Nutrition	and life cycle (6 credits)	Academic Year	2012			
Offering Department	Biological Sciences Quota 80					
Course Co-ordinator	Dr E T S Li, Biological Sciences					
Course Aim	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	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.					
Learning Outcomes	On successful completion of this course, students should be able to: - have fundamental knowledge of essential micronutrient metabolism - be able to critically assess and identify the specific needs at different stages of the life cycle - relate the concept of requirement to physiological needs - understand the impact of socio-cultural factors on nutritional status					
Pre-requisites	Pass in BIOL1514					
Offer in 2012 - 2013	1st sem	Examination	Dec			
Offer in 2013 - 2014	Y					
Teaching Hours	24 hours of lectures and 12 hours of student-centered learning					
Assessment Method	One 2 hour written examination (70% weighting) and coursework (30% weight	ing)				
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 team-based organization and presentation 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 team-based organization and presentation 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 adequately effective team-based organization and presentation skills.
	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 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 and presentation skills.
Textbooks	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, 11th edition)
References	TBC
Remarks	The course will be offered subject to a minimum enrollment number.

BIOL2534 Nutrition and public health (6 credits)			Academic Year	2012			
Offering Department	Biological S	Sciences	Quota	110			
Course Co-ordinator	Dr J M F W	Dr J M F Wan, Biological Sciences					
Course Aim	health thro	Public health nutrition unites social sciences and biomedical sciences in preventing disease and improving human health through programs aimed at enhancing good nutritional practices. This course presents a broad overview of the professional practice and essential skills required of a public health nutritionist.					
Course Contents	epidemiolo overnutritic consequen	Public health nutrition : overview, nature and identification of problems, objectives of intervention programs. 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.					
Learning Outcomes	<ul> <li>have a br</li> <li>have a c</li> <li>developed</li> <li>be able to</li> </ul>	Dn successful completion of this course, students should be able to: have a broad knowledge of the scope and methodologies of public health nutrition have a clear technical understanding of a range of selected examples of public health nutrition cases in less developed and developed countries be able to formulate recommendations for action for nutritional interventions at the community level understand the impact of socio-cultural factors on community food choices and consequently on health outcomes					
Pre-requisites	Pass in BI	DL1514					
Offer in 2012 - 2013	2nd sem		Examination	Мау			
Offer in 2013 - 2014	Y						
Teaching Hours	24 hours le	ectures, 16 hours practicals, and 8 hours tutorials/presentation					
Assessment Method	One 2-hou	r written examination (70% weighting) and coursework (30% weigh	ting)				
Course Grade	A+ to F						
Grade Descriptors	A	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Thorough grasp of the subject. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills. Apply highly effective laboratory/fieldwork skills and techniques. Critical use of data and results to draw appropriate and insightful conclusions. Apply highly effective organizational and presentational skills.					
	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	C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. General but incomplete grasp of the subject. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills. Apply moderately effective laboratory / fieldwork skills and techniques. Mostly correct but some erroneous use of data and results to draw appropriate conclusions. Apply moderately effective organizational skills.					
	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 require Little or no grasp of the knowledge and understanding of the subject. Lack of coherent thinking. Show very little or no ability to apply knowledge to solve proble minimally effective or ineffective. Apply minimally effective or ineffective laborate data and results and/or unable to draw appropriate conclusions. Organization and or ineffective.	of analytical and critical ems. Organization and pr ory / fieldwork skills and t	abilities, logical and esentational skills are echniques. Misuse of			

Textbooks	Public Health Nutrition (The Nutrition Society Textbook Series, 2004) MJ Gibney, BM Margetts, JM Kearney, L Arab (Eds)
References	TBC
Remarks	The course will be offered subject to a minimum enrollment number.

•		d engineeri	ing laborato	,				
Offering Department	Biological Sciences					Quota	70	
Course Co-ordinator	Dr J C Y Le	Dr J C Y Lee, Biological Sciences						
Course Aim	cover key	engineering		evant to the	e food industr		ing and preservation will gain hands-on	
Course Contents	properties production equipment nutritious c methods in	and requireme and commer and machine consumer food n food proce	ents. This courcialization of ery used to co d products are essing and pr	rse introduct food product onvert raw a e covered. V reservation.	es the technic cts and servic gricultural mat Ve discuss the	al knowledge es. The desi erials and in basic engin liscussed wi	tiences with know required to implen gn and developme gredients into safe eering principles a Il include those fo	nent cost-effectivent of processes, convenient, ar nd applications
Learning Outcomes	- Understa - Be able to	nd basic princ p apply their k	iples of food p nowledge and	processing m practical sk	should be able nethods and pr ills to process methods and p	eservation tee and develop		preservation.
Pre-requisites	Pass in BI	OL0002 or (Bl	OL1123 and E	BIOL1513) o	r BIOL1528			
Offer in 2012 - 2013	1st sem						Examination	Dec
Offer in 2013 - 2014	Υ							
Teaching Hours	24 lectures	, 24 hours of	laboratory/ tute	orial/ field tri	p/ seminar			
Assessment Method	0 01	24 lectures, 24 hours of laboratory/ tutorial/ field trip/ seminar One 2-hour written examination (70%); continuous assessment of practical work (20%) and assignment (10%)						
	One 2-hou	r written exam	nination (70%)		•	f practical wo	rk (20%) and assig	nment (10%)
	A+ to F	r written exam	nination (70%)		•	f practical wo	rk (20%) and assig	nment (10%)
Course Grade		Demonstrate the changes that ta and equipment solutions of exce	horough grasp of ake place in variet t for a variety of	; continuous f the subject m ty of food during food-specific p specific food p	assessment c aster covered. Sh g preparation, prod urposes. Demons	ow strong evide cessing and stora trates advance s	rk (20%) and assig ence of analytical and o age. Identifies and uses skills in designing, prod d techniques and analys	critical abilities of th advanced technique ucing and evaluatin
Course Grade Grade Descriptors	A+ to F	Demonstrate the changes that ta and equipment solutions of exit to draw approp Demonstrate s that take place a variety of for	horough grasp of ake place in variety of cellent quality for rirate and insightfu ubstantial grasp o in variety of food od-specific purpo	; continuous f the subject m ty of food during food-specific p specific food p ul conclusions. of the subject n I during prepara ses. Demonstr	assessment c atter covered. Sh greparation, prod urposes. Demons urposes. Critically hatter covered. Sh tition, processing a ates high-level sk	ow strong evide ressing and stora rates advance s use lab skills and ow evidence of nd storage. Iden ills in designing.	nce of analytical and or age. Identifies and uses skills in designing, prod	pritical abilities of the advanced technique ucing and evaluatin sis of data and result pilities of the change ues and equipment for ting solutions of hig
Course Grade	A+ to F	Demonstrate the changes that te and equipment solutions of exit to draw apprope Demonstrate s that take place a variety of for quality for spec conclusions. Demonstrate g abilities and lidentifies and skills in designi	horough grasp of ake place in variet t for a variety of cellent quality for viriate and insightfu ubstantial grasp of in variety of food od-specific purpo jeneral but incom gical thinking of uses appropriate ing, producing an	; Continuous f the subject m ty of food during food-specific p specific food put ul conclusions. of the subject n I during prepara ses. Demonstr s. Use lab skills uplete grasp of the changes ti techniques an d evaluating so	assessment c atter covered. Sh g preparation, prod urposes. Demons urposes. Critically natter covered. Sh attes high-level sk a and techniques a the subject matte nat take place in d equipment for	ow strong evide essing and stora trates advance s use lab skills and ow evidence of nd storage. Iden ills in designing, and analysis of d covered. Show variety of food a variety of food ality for specific	nce of analytical and o age. Identifies and uses skills in designing, prod d techniques and analys analytical and critical at tifies and uses techniqu producing and evalua	pritical abilities of the advanced technique ucing and evaluatin sis of data and result bilities of the change les and equipment for ting solutions of hig generally appropriat analytical and criticic cessing and storage monstrates adequat
Course Grade	A+ to F A B	Demonstrate the changes that tail and equipment solutions of exit to draw appropo- Demonstrate sis that take place a variety of foor quality for spec- conclusions. Demonstrate g abilities and lo Identifies and skills in designi and analysis of Demonstrate p evidence of con- storage. Identifies	horough grasp of ake place in variet for a variety of cellent quality for rirate and insightfu ubstantial grasp of in variety of food od-specific purpo cific food purpose deneral but incom orgical thinking of uses appropriate ing, producing and data and results artial but limited herent and logical fies and uses bas	; Continuous f the subject m ty of food during food-specific p specific food p ul conclusions. of the subject n l during prepara ses. Demonstr s. Use lab skills plete grasp of the changes ti techniques an d evaluating so to draw moder. grasp, with rete al thinking of the ice techniques as	assessment c aster covered. Sh g preparation, pro urposes. Demons urposes. Demons urposes. Critically natter covered. Sh tition, processing a ates high-level sk s and techniques a the subject matter hat take place in d equipment for ately appropriate c ention of some reli- e changes that tal ind equipment for s for specific food	ow strong evide essing and storr trates advance s use lab skills and ow evidence of nd storage. Iden lils in designing, and analysis of d covered. Show variety of food a variety of food ality for specific onclusions. evant information e place in variet a variety of food	nce of analytical and o age. Identifies and uses skills in designing, prod d techniques and analys analytical and critical at tifies and uses techniqu producing and evalua ata and results to draw adequate evidence of during preparation, pro -specific purposes. Dei	pritical abilities of th advanced technique ucing and evaluatin sis of data and result bilities of the change les and equipment for ting solutions of hig generally appropriat analytical and critic cessing and storage monstrates adequat skills and technique covered. Show som ation, processing an onstrates basic skil
Course Grade	A+ to F A B C	Demonstrate the changes that tai and equipment solutions of exit to draw apprope Demonstrate s that take place a variety of for quality for spec- conclusions. Demonstrate g abilities and lo Identifies and or Identifies and or skills in designing and analysis of Demonstrate p evidence of co storage. Identif in designing, p and results to co Demonstrate lift and logical thin guidance facto guidance, dem	horough grasp of ake place in variet t for a variety of cellent quality for rirate and insightfu- ubstantial grasp o in variety of food od-specific purpo- sific food purpose general but incom gigical thinking of uses appropriate ing, producing an f data and results artial but limited herent and logica fies and uses bas roducing and eva atraw appropriate of ttle or no grasp, w iking of he chang rs and uses limited	; CONTINUOUS f the subject m ty of food during food-specific p specific food p ul conclusions. of the subject n d during prepara ses. Demonstr s. Use lab skills the changes ti techniques an d evaluating so to draw moder; grasp, with reted al thinking of th icic techniques a julating solution conclusions occ with retention of tes that take pla te appropriate is to designi	assessment c atter covered. Sh g preparation, prod urposes. Demons proses. Critically natter covered. Sh titon, processing a tates high-level sk a and techniques at the subject matte hat take place in a d equipment for ately appropriate c ention of some rel e changes that tal ind equipment for s for specific food assionally. little relevant info ace in variety of fo techniques and e	ow strong evide ressing and stora rates advance s use lab skills and ow evidence of nd storage. Iden ills in designing, and analysis of d r covered. Show variety of food a variety of food a variety of food autily for specific onclusions. evant information e place in variet a variety of food purposes. Use I mation, of the si od during prepar upment for a li evaluating solut	ance of analytical and or age. Identifies and uses skills in designing, prod d techniques and analys analytical and critical at tifies and uses techniqu producing and evalut ata and results to draw adequate evidence of during preparation, pro during preparation, pro specific purposes. Use lab n, of the subject matter y of food during prepar- specific purposes. Den	critical abilities of th advanced technique ucing and evaluatin sis of data and result bilities of the change ues and equipment for ing solutions of hig generally appropriat analytical and critica cessing and storage monstrates adequat skills and technique covered. Show som ation, processing an nonstrates basic skil s and analysis of dat Show lack of coheren torage. Identifies wit ecific purposes. Wat proses. Use lab skil
Course Grade	A+ to F         A         B         C         D         Fail         Food Process	Demonstrate the changes that tail and equipment solutions of exits of draw appropriate to draw appropriate the conclusions. Demonstrate is that take place a variety of for quality for speed conclusions. Demonstrate grabilities and on a lidentifies and on a lidentifies and one shalls in designing, private results to constrarge. Identifing didance factor guidance, dem and technique conclusions. Demonstrate limes and technique conclusions. Demonstrate	horough grasp of ake place in variet t for a variety of cellent quality for rirate and insightfu ubstantial grasp o in variety of food od-specific purpo sific food purpose general but incom gical thinking of uses appropriate ing, producing an data and results artial but limited a herent and logica fies and uses bas draw appropriate of ttle or no grasp, w king of he chang rs and uses som onstrates limited a s and analysis of	; Continuous f the subject m ty of food during food-specific p specific food p ul conclusions. of the subject n d during prepara ses. Demonstr s. Use lab skills the changes ti techniques an d evaluating so to draw moder: grasp, with reted al thinking of th icic techniques a iluating solution conclusions occ with retention of tes that take pla te appropriate te appropriate and resign of data and re	assessment c assessment c properties of the second provide the subject matter attes high-level sk as and techniques a the subject matter at take place in at take place in at take place in at take place in at take place in a equipment for situation of some rel e changes that tal and equipment for assionally. little relevant info ace in variety of fo techniques and e sults ineffectively a 3rd Ed P.J. F	ow strong evide ressing and stora rates advance s use lab skills and ow evidence of nd storage. Iden ills in designing, and analysis of d covered. Show variety of food a variety of food a variety of food ality for specific onclusions. evant information e place in variet a variety of food purposes. Use I mation, of the si od during prepar uppment for a li evaluating solut leading genera	ance of analytical and or age. Identifies and uses skills in designing, prod d techniques and analys analytical and critical at tifies and uses techniqu producing and evaluar ata and results to draw adequate evidence of during preparation, pro- l-specific purposes. Der food purposes. Use lab n, of the subject matter y of food during prepar- specific purposes. Den ab skills and techniques ubject matter covered. S ation, processing and s mited range of food-sp ons for specific food pu	critical abilities of th advanced technique ucing and evaluatin sis of data and result bilities of the change ues and equipment for ing solutions of hig generally appropriat analytical and critica cessing and storage monstrates adequat skills and technique covered. Show som ation, processing an nonstrates basic skil s and analysis of dat Show lack of coheren torage. Identifies wit ecific purposes. Wat proses. Use lab skil
Course Grade Grade Descriptors	A+ to F         A         B         C         D         Fail         Food Process	Demonstrate the changes that tail and equipment solutions of exits of draw appropriate to draw appropriate the conclusions. Demonstrate is that take place a variety of for quality for speed conclusions. Demonstrate grabilities and on a lidentifies and on a lidentifies and one shalls in designing, private results to constrarge. Identifing didance factor guidance, dem and technique conclusions. Demonstrate limes and technique conclusions. Demonstrate	horough grasp of ake place in variet to ra variety of cellent quality for rirate and insightfu- ubstantial grasp of in variety of food od-specific purpo- sific food purpose igneral but incom gigical thinking of uses appropriate ing, producing an data and results artial but limited herent and logica fies and uses bas traw appropriate of ttle or no grasp, w iking of he chang rs and uses som onstrates limited s and analysis of blogy-Principle	; Continuous f the subject m ty of food during food-specific p specific food p ul conclusions. of the subject n d during prepara ses. Demonstr s. Use lab skills the changes ti techniques an d evaluating so to draw moder: grasp, with reted al thinking of th icic techniques a iluating solution conclusions occ with retention of tes that take pla te appropriate te appropriate and resign of data and re	assessment c assessment c properties of the second provide the subject matter attes high-level sk as and techniques a the subject matter at take place in at take place in at take place in at take place in at take place in a equipment for situation of some rel e changes that tal and equipment for assionally. little relevant info ace in variety of fo techniques and e sults ineffectively a 3rd Ed P.J. F	ow strong evide ressing and stora rates advance s use lab skills and ow evidence of nd storage. Iden ills in designing, and analysis of d covered. Show variety of food a variety of food a variety of food ality for specific onclusions. evant information e place in variet a variety of food purposes. Use I mation, of the si od during prepar uppment for a li evaluating solut leading genera	ance of analytical and or age. Identifies and uses skills in designing, prod d techniques and analys analytical and critical at tifies and uses techniqu producing and evaluar ata and results to draw adequate evidence of during preparation, pro- l-specific purposes. Der food purposes. Use lab n, of the subject matter y of food during prepar- specific purposes. Den ab skills and techniques ubject matter covered. S ation, processing and s mited range of food-sp ons for specific food pu	critical abilities of th advanced technique ucing and evaluatin sis of data and result bilities of the change ues and equipment for ing solutions of hig generally appropriat analytical and critica cessing and storage monstrates adequat skills and technique covered. Show som ation, processing an nonstrates basic skil s and analysis of dat Show lack of coheren torage. Identifies wit ecific purposes. Wat proses. Use lab skil

BIOL2536 Food and nutrients analysis laboratory course (6 credits) Academic Year 201			2012	
Offering Department	Biological Sciences	Quota 70		
Course Co-ordinator	Dr M F Wang, Biological Sciences			
Course Aim	To introduce basic principles and provide practical training in food and nutrien analysis. To help students to understand the principles behind analytical instruments used in food analysis. To train students to analyze major and min food components as well as some food adulterants.			
Course Contents	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 food will be covered. A variety of classical and instrumental techniques used i			

		vsis will be discussed: rheology and texture measurement, thermal color, spectroscopy, chromatography and electrophoresis.				
Learning Outcomes	<ul> <li>understa</li> <li>be familia</li> <li>understa</li> <li>be able a</li> <li>measure a</li> <li>be able t</li> </ul>	ssful completion of this course, students should be able to: ind the basic principles of food and nutrient analysis; ar with a variety of classical and instrumental analytical techniques; ind the principles behind analytical instruments associated with food apply their knowledge and laboratory skills in novel situations to and analyze the macronutrient and micronutrient of food products; o select and justify an appropriate analytical technique to solve bood analysis problems.				
Pre-requisites	Pass in E BIOL1528	BIOC1001 or BIOL1125 or BIOL0128 or BIOL1122 or BIOL012	26 or (BIOL1123 a	nd BIOL1513) or		
Offer in 2012 - 2013	1st sem		Examination	Dec		
Offer in 2013 - 2014	Y			1		
Teaching Hours	24 lecture	s, 24 hours of laboratory sessions				
Assessment Method	One 2-hou	ur written examination (60%); continuous assessment of practical w	ork and assignmen	t (40%)		
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	Demonstrate general but incomplete grasp of the subject matter covered. Show some evidence of analytical and critical abilities and logical thinking with limited competence in professional-level problem solving. Use lab skills and techniques and analysis of data and results to draw moderately appropriate but sometimes erroneous conclusions to real-world problems. Demonstrate moderately effective team-based organizational and presentational skills.				
	D Demonstrate partial but limited grasp, with retention of some relevant information, of the subject matter covered. Show some evidence of coherent and logical thinking, but lacking competence in professional-level problem solving. Use lab skills and techniques and analysis of data and results to draw sometimes appropriate but often erroneous conclusions to real-world problems. Demonstrate team-based organizational and presentational skills of limited effectiveness.					
	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.					
Textbooks	Y. Pomeranz and C.E. Meloan: Food Analysis: Theory and Practice (Van Nostrand Reinhold, 1994, 3rd ed.) S. S. Nielsen: Introduction to the Chemical Analysis of Foods (Jones & Barlett, 2000, 2nd ed.)					
	TBC					
References	TBC					

BIOL2538 Nutraceu	ticals and	functional foods (6 credits)	Academic Year	2012			
Offering Department	Biological	Sciences	Quota	40			
Course Co-ordinator	Dr M F W	ang, Biological Sciences					
Course Aim	emphasis	To provide a fundamental understanding of the rapidly emerging functional food/nutraceutical industry with an emphasis on the history, regulation, chemical basis and quality control of healthy ingredients/products and their effects on human health.					
Course Contents	nutraceuti fibers as containing	history and global regulation of functional foods and nutraceutic icals based on their chemical structures; unsaturated fatty aci healthy food ingredients; health benefits of dietary phenoli g compounds; probiotics and prebiotics; small berries, spices, t rance of functional foods and nutraceuticals.	ds, proteins, food pigr cs, terpenes, phytoste	nents and dietary erols and sulphur			
Learning Outcomes	-understa -have sub - be able t -demonst	ssful completion of this course, students should be able to: nd the definition and global regulation of functional foods and nu ostantial chemical knowledge of functional food and nutraceutical to describe examples of functional foods and interpret critically the rate understanding of the current functional food and nutraceuticand nd major techniques and technologies for quality control and ma	products heir claimed health ben al industry				
Pre-requisites	Pass in B	IOL1514 and BIOL1528					
Offer in 2012 - 2013	1st sem		Examination	Dec			
Offer in 2013 - 2014	Y						
Teaching Hours	24 hours	lectures and 12 hours tutorials/seminars					
Assessment Method	One 2-ho	ur written examination (70% weighting) and continuous assessm	ent (30% weighting)				
Course Grade	A+ to F						
Grade Descriptors	A Demonstrate thorough grasp of the subject matter covered. Show strong analytical and critical abilities and logical thir with evidence of creative ability and competence in professional-level problem solving. Critically use knowledge to appropriate and insightful conclusions to real-world problems. Demonstrate highly effective team-based organizationa presentational skills.						

Remarks	The course will be offered subject to a minimum enrollment number.
References	TBC
Textbooks	R. E. C. Wildman: Handbook of Nutraceuticals and Functional Foods (CRC Press, 2007) C. M. Hasler: Regulation of Functional Foods and Nutraceuticals: a Global Perspective (IFT Press, 2005)
	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.
	D monstrate 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.
	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 knowledge to draw moderately appropriate but sometimes erroneous conclusions to real-world problems. Demonstrate moderately 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.

BIOL2540 Food and	Nutrition	nal T	To	cology (6 credits)	4	Academic Year	2012
Offering Department	Biological Sciences				C	Quota	90
Course Co-ordinator	Dr H S El	El-Nez	Veza	i, Biological Sciences			
Course Aim	exposure	e of t	of tox	provide students basic principles of toxicology with ants, absorption, metabolism, distribution and excretic ortance of dose-response in toxicology.			
Course Contents	concepts effects, th	s in e the a	n exp e act	discussion on exposure and entry routes, fates of to erimental toxicology, the dose response relationship, ns and types of carcinogens, and a survey of the h o presented.	, actions	of toxic substan	ces, target orgai
Learning Outcomes	<ol> <li>Demor of toxican</li> <li>Demor</li> <li>Demor toxicants.</li> </ol>	onstra ants, ii onstra onstra s.	strate s, inc strate strate	mpletion of this course, students should be able to: in understanding of the processes involved in absorp ding an understanding of the toxicokinetic behavior of n understanding of the various effects induced after ex an understanding of the factors which underlie spe ne ability to work in a team to address tasks relevant to	toxicants xposure t ecies diff	s in mammals. to toxicants. ferences in respo	onse to potentia
Pre-requisites	Pass in B	BIOL	OL15	8 or BIOL1123			
Offer in 2012 - 2013	2nd sem	n			E	Examination	Мау
Offer in 2013 - 2014	Y						
Teaching Hours	24 lecture	res; 1	; 16	ours laboratory, 8 hours tutorial			
Assessment Method	One 2-hc (50% wei			en examination (50% weighting); continuous assessm	ment of la	aboratory work a	nd group semina
Course Grade	A+ to F						
Grade Descriptors	A	w a	with and	nstrate thorough grasp of the subject matter covered. Show stron vidence of creative ability and competence in professional-level pro nalysis of data and results to draw appropriate and insightful con ve team-based organizational and presentational skills.	roblem solv	ing. Critically use lab	skills and techniques
	В	B Demonstrate substantial grasp of the subject matter covered. Show evidence of analytical and critical abilities and logical thinking with some evidence of competence in professional-level problem solving. Use lab skills and techniques and analysis of data and results to draw generally appropriate conclusions to real-world problems. Demonstrate effective team-based organizational and presentational skills.					
	C Demonstrate general but incomplete grasp of the subject matter covered. Show some evidence of analytical and critical abilities and logical thinking with limited competence in professional-level problem solving. Use lab skills and techniques and analysis of data and results to draw moderately appropriate but sometimes erroneous conclusions to real-world problems. Demonstrate moderately effective team-based organizational and presentational skills.						
	Demonstrate partial but limited grasp, with retention of some relevant information, of the subject matter covered. Show some evidence of coherent and logical thinking, but lacking competence in professional-level problem solving. Use lab skills and techniques and analysis of data and results to draw sometimes appropriate but often erroneous conclusions to real-world problems. Demonstrate team-based organizational and presentational skills of limited effectiveness.						
	Fail Demonstrate little or no grasp, with retention of little relevant information, of the subject matter covered. Show lack of coherent and logical thinking, and minimal competence in professional-level problem solving. Use lab skills and techniques and analysis of data and results ineffectively, leading generally to inappropriate and usually erroneous conclusions to real-world problems. Demonstrate ineffectiveness team-based organizational and presentational skills.						
Textbooks	S. S. Des	eshpa	pand	Handbook of Food Toxicology (Marcel Dekker Inc., N	NY, 2002)		
Remarks	S. S. Desnpande: Handbook of Food Toxicology (Marcel Dekker Inc., NY, 2002) This course is to replace BIOL2529 Food and Nutritional Toxicology The course will be offered subject to a minimum enrollment number.						

Offering Department Biological Sciences Quota 80	BIOL2606 Environm	Academic Year	2012	
	Offering Department	Biological Sciences	Quota	80

Course Co-ordinator		•	Dr J D Gu, Biological Sciences				
Course Aim	To familarize students with the role of various microorganisms in natural process which affect our environment, such as recycling of chemical elements, interactions with plants and animals, and the way in which they carry out biodegradation of environmentally important pollutants. Selective groups of microorganism will be examined in detail for their biochemical processes. Key concepts are illustrated with known examples and cases.						
Course Contents	<ol> <li>Contribution</li> <li>Microbia</li> <li>Microbia</li> </ol>	ed aspects of microbial diversity, ecology and growth. tion of microbial metabolism to biogeochemical processes import I interactions with plants and animals. I metabolism of organic compounds, metals and man-made polyr in laboratory and field microbiological research techniques.	, ,	trients.			
Learning Outcomes	<ul> <li>Understa biochemica</li> <li>Know the and their d</li> </ul>	sful completion of this course, students should be able to: ind a range of microorganisms in the environment in terms of al capability and host range. e specific biochemical processes, enzymes involved and reaction istribution in the environment. appropriate techniques in environmental and microbial research.	ns carried by selec				
Pre-requisites	Pass in BIO	DL0129 or BIOL0135 or ENVS1002 or BIOL0126					
Offer in 2012 - 2013	Not offered	1	Examination	To be confirmed			
Offer in 2013 - 2014	Y						
Teaching Hours	24 lectures	, 36 hours of laboratory classes/student-centred learning					
Assessment Method	One 2-hou	r MCQ and written answer examination (60% weighting), coursev	vork (40% weighting	g)			
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.						
	В	B Substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Substantial grasp of the subject. Show evidence of analytical and critical abilities and logical thinking. Apply effective lab skills and techniques. Correct use of data of results to draw appropriate conclusions. Apply effective organizational and presentational skills.					
	С	General but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. General but incomplete grasp of the subject. Evidence of some analytical and critical abilities and logical thinking. Apply moderately effective lab skills and techniques. Mostly correct but some erroneous use of data and results to draw appropriate conclusions. Apply moderately effective organizational and presentational skills.					
	D	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. Evide or no grasp of the knowledge and understanding of the subject. Evidence of little or lack of analytical and critical logical and coherent thinking. Minimally effective or ineffective lab skills and techniques. Misuse of data and resunable to draw appropriate conclusions. Organization and presentational skills are minimally effective or ineffective.						
Textbooks	M.T. Madigan, J. M. Martinko, P.V. Dunlap and D.P. Clark: Brock Biology of Microorganisms (Pearson/Benjamin Cummings, 2009, 12th ed.) R.M. Atlas and R. Bartha: Microbial Ecology: Fundamentals and Applications (Benjamin Cummings, 1998, 4th ed.)						
References	Molecular Biology of the Cell - Fifth Edition by Bruce Alberts, Alexander Johnson, Julian Lewis, Martin Raff, Keith Roberts, Peter Walter (December 2007) R. Mitchell and JD. Gu: Environmental Microbiology (Wiley-Blackwell, 2009, 2nd ed.)						
Course Website	http://www	biosch.hku.hk/ecology/lsc/biol2606/					

BIOL2607 Fish biolo	gy (6 credits)	Academic Year	2012			
Offering Department	Biological Sciences Quota 50					
Course Co-ordinator	Prof Y J Sadovy, Biological Sciences		-			
Course Aim	To acquaint students with the principles governing interrelationships among fishes as well as with the biotic ar abiotic aspects of their environment thereby to provide an understanding of the factors determining specie population dynamics and multispecies interactions. To understand species diversity in relation to conservation ar management challenges in different assemblages with emphasis on coral reef assemblages, and an introduction local reef fishes.					
Course Contents	Introduction to course: biological and ecological concepts; fish diversity a species patterns: influence of environment on distribution; feeding ecology; modes of sexuality; strategies in time and space. Multispecies interaction: and freshwater fish assemblages; coral reef communities; censusing fish conservation of fishes; ethics of fish research and exploitation.	growth; movement; s: competition and m	reproduction and nutualism; marine			
Learning Outcomes	On successful completion of this course, students should be able to: - understand of the basis of fish species diversity in relation to phylogenetic, - appreciate of the direct and indirect impacts and consequences of assemblages. - develop the ability for critical and synthetic thinking.					
Pre-requisites	Pass in BIOL1121 or BIOL0603 or BIOL0625 or BIOL0604 or BIOL0600					
Offer in 2012 - 2013	2nd sem	Examination	May			

Offer in 2013 - 2014	Y					
Teaching Hours	24 lectures and 36 hours of laboratory, student-centred learning or field work					
Assessment Method	One 2-hour written examination (60% weighting) and continuous assessment (40% weighting) from laboratory reports, essays or other assignments					
Course Grade	A+ to F					
Grade Descriptors	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, ability to integrate and synthesize information, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective presentational skills. Strong evidence of clear attention to thoughtful and reflective thinking.					
	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, integration of materials and ability to apply knowledge to familiar and some unfamiliar situations. Demonstrate effective presentational skills. Evidence of clear attention to thoughtful and reflective thinking.					
	C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective presentational skills Little evidence of clear attention to thoughtful and reflective thinking.					
	D 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.					
Textbooks	G. Helfman, B. Collette and D. Facey: The Diversity of Fishes (Blackwell Science, 1997) Y. Sadovy & A. S. Comish: Reef Fishes of Hong Kong (HKU Press, 2000) A list of reading material will be provided during the course.					
References	TBC					
Course Website	http://ecology.hku.hk/vsb/lsc/biol2607/ModHome.htm					
Remarks	The course will be offered subject to a minimum enrollment number.					

	ology (6 credits)			Academic Year	2012			
Offering Department	<b>Biological Sciences</b>			Quota	40			
Course Co-ordinator	Dr M Yasuhara, Biological Sciences							
Course Aim	This course provides an introduction to the physical, chemical, and biological processes that occur in oceans and explains the importance of the oceans to all life on earth. The emphasis is on how marine organisms interact with each other and with their environment by considering various ecosystems, as well as the adaptations of marine life to their particular habitats. Students will explore adaptations that allow species to thrive and form the complex web of ocean life. Specific examples from South East Asia, the South China Sea and Hong Kong will be included.							
Course Contents	An introduction to oceanography, ocean topography (continental margins and ocean basins), marine sediments, waves and tsunamis, physical properties of seawater, marine chemistry and nutrients, ocean circulation and currents, satellite oceanography and El Nino-La Nina, phytoplankton and primary productivity, zooplankton, nekton (sharks, tunas and sunfishes), marine mammals (dolphins and whales), neritic benthic ecosystems, coral reefs, coral communities in Hong Kong, deep-sea ecosystems (deep-sea pelagic, deep-sea benthic and hydrothermal vent communities), global climate change and its effects on the oceans, and ocean acidification.							
Learning Outcomes	On successful completion of the course, students should be able to: - appreciate the importance of the oceans to life on earth - describe the characteristics of some of the major habitats of the oceans and explain how marine organisms have adapted to their particular environments - understand some of the physical, chemical and geological processes in the oceans and how they relate to or influence marine life - demonstrate first-hand experience in the use of hydrographical and marine biological field sampling equipment - understand how global climate change will affect the oceans and human society							
	- understand how g	bal climate change will affect the c	oceans and human soci	ety				
Pre-requisites		bbal climate change will affect the or BIOL0625 or BIOL0604 or BIOL0		•	002			
•		•		•	002 May			
Dffer in 2012 - 2013	Pass in BIOL0603	•		SC0105 or ENVS10				
Offer in 2012 - 2013 Offer in 2013 - 2014	Pass in BIOL0603 of 2nd sem Y	•	605 or BIOL0600 or EA	SC0105 or ENVS10	Мау			
Offer in 2012 - 2013 Offer in 2013 - 2014 Teaching Hours	Pass in BIOL0603 ( 2nd sem Y 24 lectures; 4 hours One 2-hour writter	r BIOL0625 or BIOL0604 or BIOL0	605 or BIOL0600 or EA 4 hours group work/proj purse assessment (20%	SC0105 or ENVS10 Examination ect and 4 hours fiel	May d work			
Offer in 2012 - 2013 Offer in 2013 - 2014 Teaching Hours Assessment Method	Pass in BIOL0603 ( 2nd sem Y 24 lectures; 4 hours One 2-hour writter	tutorial; 12 hours laboratory work;	605 or BIOL0600 or EA 4 hours group work/proj purse assessment (20%	SC0105 or ENVS10 Examination ect and 4 hours fiel	May d work			
Pre-requisites Offer in 2012 - 2013 Offer in 2013 - 2014 Teaching Hours Assessment Method Course Grade Grade Descriptors	Pass in BIOL0603 ( 2nd sem Y 24 lectures; 4 hours One 2-hour writter laboratory report (1 A+ to F A Demons learning to apply	tutorial; 12 hours laboratory work;	605 or BIOL0600 or EA 4 hours group work/proj purse assessment (20% on (10% weighting) el of extensive knowledge ar al abilities and logical thinking	SC0105 or ENVS10 Examination ect and 4 hours fiel 6 weighting), test ( d skills required for atta with evidence of original	May d work 10% weighting) ining all the course i thought, and ability			
Offer in 2012 - 2013 Offer in 2013 - 2014 Teaching Hours Assessment Method Course Grade	Pass in BIOL0603 ( 2nd sem Y 24 lectures; 4 hours One 2-hour writter laboratory report (1 A+ to F A Demons learning to apply presenta B Demons	tutorial; 12 hours laboratory work; examination (50% weighting), co % weighting) and group presentati ate thorough mastery at an advanced levu utcomes. Show strong analytical and critica nowledge to a wide range of complex, fa	605 or BIOL0600 or EA 4 hours group work/proj purse assessment (20% on (10% weighting) el of extensive knowledge ar al abilities and logical thinking miliar and unfamiliar situatior	SC0105 or ENVS10 Examination ect and 4 hours fiel 6 weighting), test ( d skills required for atta with evidence of origina is. Apply highly effective irred for attaining at leas thinking, and ability to	May d work 10% weighting), ining all the course il thought, and ability e organizational and t most of the course			
Offer in 2012 - 2013 Offer in 2013 - 2014 Teaching Hours Assessment Method Course Grade	Pass in BIOL0603 ( 2nd sem Y 24 lectures; 4 hours One 2-hour writter laboratory report (1 A+ to F A Demons learning familiar a C Demons	tutorial; 12 hours laboratory work; examination (50% weighting), co % weighting) and group presentati ate thorough mastery at an advanced levu utcomes. Show strong analytical and critica nowledge to a wide range of complex, fai onal skills. ate substantial command of a broad range putcomes. Show evidence of analytical and	605 or BIOL0600 or EA 4 hours group work/proj purse assessment (20% on (10% weighting) el of extensive knowledge ar al abilities and logical thinking miliar and unfamiliar situatior of knowledge and skills requ d critical abilities and logical knowledge and skills require ritical abilities and logical thin	SC0105 or ENVS10 Examination ect and 4 hours fiel weighting), test ( with evidence of origina with evidence of origina s. Apply highly effective irred for attaining at leas thinking, and ability to ational skills. d for attaining most of king, and ability to apply	May d work 10% weighting) hining all the course i thought, and ability organizational and t most of the course apply knowledge to the course learning			

		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 ou Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge problems. Organization and presentational skills are minimally effective or ineffective.					
Textbooks	Levinton:	akken: Marine Biology: An Ecological View (Benjamin Cummings, 2000) Marine Biology: Function, Biodiversity, Ecology (Oxford University Press, 2008) nd Henderson: Marine Ecology: Concepts and Applications (Wiley-Blackwell, 2010)				
References	TBC					
Course Website	http://www	http://www.biosch.hku.hk/ecology/lsc/biol2610/				
Remarks The course will be offered subject to a minimum enrollment number.						

		ogenetics (6 credits)		Academic Year	2012					
Offering Department	Biologica	Sciences		Quota	40					
Course Co-ordinator	Prof R M	K Saunders, Biological Sciences								
Course Aim	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	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.									
Learning Outcomes	<ul> <li>Explain</li> <li>be applie</li> <li>Describ</li> <li>group rel</li> <li>Evaluat</li> <li>Recogn</li> <li>Unders</li> </ul>	On successful completion of this course, students should be able to: - Explain taxon concepts (with particular reference to species) and show how multivariate statistical methods can be applied below the species level. - Describe the principles behind maximum parsimony methods of phylogenetic reconstruction (including sister- group relationships, out-group comparison, homoplasy and the assessment of clade stability). - Evaluate the diversity of sources of taxonomic data, and explain the importance of specific data sources. - Recognise the main causes of taxonomic complexity, and identify appropriate solutions. - Understand the principles of nomenclature in order to interpret the previous application of scientific names are validly publish new names.								
Pre-requisites	Pass in E	IOL1121 or BIOL0604								
Offer in 2012 - 2013	1st sem			Examination	Dec					
Offer in 2013 - 2014	Y									
Teaching Hours	24 lectur	es and 18 hours of laboratory and 18 hours (minimum	n) group work/proj	ect						
Assessment Method		ur written examination (80% weighting), continuous / report (10% weighting)	assessment of p	practical work (109	% weighting) and					
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 outcomes, with evidence of some background reading and use of named examples. Show evidence of critical abilities and logical thinking. Apply effective presentation skills. Demonstrate use of data and results to draw appropriate and insightful conclusions. Show evidence of general integration of appropriate theories, principles, evidence and techniques.									
	C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes, with evidence of limited background reading and use of named examples. Show evidence of some critical abilities and logical thinking. Apply moderately effective presentation skills. Demonstrate mostly correct use of data and results to draw appropriate and insightful conclusions. Show evidence of partial integration of appropriate theories, principles, evidence and techniques.									
	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes, with insufficient evidence of background reading and use of named examples. Show evidence of limited critical abilities and logical thinking. Apply limited presentation skills. Demonstrate limited ability to use data and results to draw appropriate and insightful conclusions. Show evidence of limited integration of appropriate theories, principles, evidence and techniques.									
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes, with no evidence of background reading or use of named examples. Show little or no evidence of critical abilities and logical thinking. Presentational skills are minimally effective or ineffective. Misuse of data and results to draw appropriate conclusions. Little or no evidence of integration of appropriate theories, principles, evidence and techniques.									
	Little or no evidence of integration of appropriate theories, principles, evidence and techniques. E. Mayr & P. D. Ashlock: Principles of Systematic Zoology (McGraw-Hill, 1991, 2nd ed.) W. S. Judd et al.: Plant Systematics - A Phylogenetic Approach (Sinauer, 1999)									
Textbooks	W. S. Ju	id et al.: Plant Systematics - A Phylogenetic Approact	(Sinauer, 1999)							
Textbooks References	W. S. Jud TBC	lo et al Plant Systematics - A Phylogenetic Approact								
	TBC	w.biosch.hku.hk/ecology/lsc/biol2611/	in (Sinader, 1999)							

Offering Department	Biological	Sciences	Quota	40			
Course Co-ordinator	Prof Y J Sa	adovy, Biological Sciences					
Course Aim	To introduce students to the theory and practice of conservation and to provide students with a thorougl understanding of practical, economic and management skills required for proficiency in conservation biology. Ou ultimate aim is to promote an understanding of the natural biodiversity, the threats to it, and the best ways t manage them. We hope these will be your aims too, and that you will be able to use the skills and knowledge yo learn from the course to reduce the local, regional and global loss of biodiversity.						
Course Contents	Among the many environmental issues, the most serious is the increasingly rapid loss of biodiversity. This loss is irreversible on a human timescale and will reduce the options available to all future human generations. Conservation Biology/Ecology is the science of preserving biological diversity. This course also provides insights to the many benefits and services that nature offers and explores strategies for management options to sustain ecological integrity and production. It is an inexact, applied, mission-orientated, multidisciplinary science which, like medicine, has built-in values: to a conservation biologist, as to a doctor, it matters whether the patient lives or dies. It is also a very new science, bringing together elements from ecology, environmental science, forestry, resource management and many other fields. The course is designed to provide the knowledge, theories, and research related to biodiversity conservation. Our teaching focuses on biodiversity conservation and an introduction to conservation legislation and economics. We emphasis on the integration of knowledge, skills and abilities that are required to practice conservation. Our problem based learning approach will require students to actively participate in their group project/class room debate by researching.						
Learning Outcomes	On successful completion of this course, students should be able to: - develop a framework for critical thinking about biodiversity, environment and human interaction - understand why species are becoming extinct and predict which ones will be most vulnerable - understand the importance of the threat of tropical deforestation, marine and coastal degradation, and habitat fragmentation in species extinction, and explain the main forces behind habitat and biodiversity loss - understand the principles of population viability analysis, the basis of single-species conservation management and the role of ex situ conservation, ecological restoration and reintroduction in conservation - outline the legal and administrative basis for conservation in Hong Kong and the world - appreciate the roles and relationships of economic, social and environmental sciences in the conservation of biodiversity						
Pre-requisites	Pass in Bl	OL1106 or BIOL1121 or BIOL0604 or ENVS1002 or BIOL0126					
Offer in 2012 - 2013	2nd sem		Examination	May			
Offer in 2013 - 2014	Y						
Feaching Hours	24 lectures	s; 8 hours tutorial; 8 hours group work/project and 10 hours field wo	rk				
Assessment Method		rr written examination (60% weighting), continuousus assessment ( presentation (10% weighting)	20% weighting), test	(10% weighting			
Course Grade	A+ to F						
Grade Descriptors	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, ability to integrate and synthesize information, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective presentational skills. Strong evidence of clear attention to thoughtful and reflective thinking.						
	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, integration of materials and ability to apply knowledge to familiar and some unfamiliar situations. Demonstrate effective presentational skills. Evidence of clear attention to thoughtful and reflective thinking.						
	В	learning outcomes. Show evidence of analytical and critical abilities and logical apply knowledge to familiar and some unfamiliar situations. Demonstrate effect	thinking, integration of ma	terials and ability t			
	B C	learning outcomes. Show evidence of analytical and critical abilities and logical apply knowledge to familiar and some unfamiliar situations. Demonstrate effect	thinking, integration of ma ctive presentational skills. ed for attaining most of t nking, and ability to apply	terials and ability to Evidence of clean the course learning knowledge to mos			
		learning outcomes. Show evidence of analytical and critical abilities and logical t apply knowledge to familiar and some unfamiliar situations. Demonstrate effect attention to thoughtful and reflective thinking. Demonstrate general but incomplete command of knowledge and skills require outcomes. Show evidence of some analytical and critical abilities and logical thin familiar situations. Apply moderately effective presentational skills. Little evidence	thinking, integration of ma ctive presentational skills. ed for attaining most of f nking, and ability to apply e of clear attention to thou aining some of the course ical and critical abilities a	terials and ability to Evidence of clea the course learning knowledge to mos ghtful and reflective learning outcomes and little attempt a			
	С	<ul> <li>learning outcomes. Show evidence of analytical and critical abilities and logical i apply knowledge to familiar and some unfamiliar situations. Demonstrate effect attention to thoughtful and reflective thinking.</li> <li>Demonstrate general but incomplete command of knowledge and skills require outcomes. Show evidence of some analytical and critical abilities and logical thin familiar situations. Apply moderately effective presentational skills. Little evidence thinking.</li> <li>Demonstrate partial but limited command of knowledge and skills required for att Show evidence of some coherent and logical thinking, but with limited analytic integration. Show limited ability to apply knowledge to solve problems. Apply limited</li> </ul>	thinking, integration of ma ctive presentational skills ed for attaining most of f nking, and ability to apply e of clear attention to thou aining some of the course ical and critical abilities a ted effectiveness in present d for attaining the course little or no ability to apply	terials and ability tr Evidence of clea he course learning knowledge to mos ghtful and reflectiv learning outcomes and little attempt a ntational skills. Lac learning outcomes			
Textbooks	C D Fail R. B. Prima V. D. Fred M.L. Hunte	<ul> <li>learning outcomes. Show evidence of analytical and critical abilities and logical I apply knowledge to familiar and some unfamiliar situations. Demonstrate effect attention to thoughtful and reflective thinking.</li> <li>Demonstrate general but incomplete command of knowledge and skills require outcomes. Show evidence of some analytical and critical abilities and logical thin familiar situations. Apply moderately effective presentational skills. Little evidence thinking.</li> <li>Demonstrate partial but limited command of knowledge and skills required for att Show evidence of some coherent and logical thinking, but with limited analyti integration. Show limited ability to apply knowledge to solve problems. Apply limit of attention to houghtful and reflective thinking.</li> <li>Demonstrate little or no evidence of command of knowledge and skills required Lack of analytical and critical abilities, logical and coherent thinking. Show very</li> </ul>	thinking, integration of ma ctive presentational skills. ed for attaining most of f nking, and ability to apply e of clear attention to thou aining some of the course ical and critical abilities a ted effectiveness in present d for attaining the course little or no ability to apply tive. applications (Spring II, 2007, 3rd Ed)	terials and ability t Evidence of clea the course learning knowledge to mos ghtful and reflectiv learning outcomes ind little attempt a ntational skills. Lac learning outcomes knowledge to solv er, 2008)			
Textbooks Course Website	C D Fail R. B. Prima V. D. Fred M.L. Hunte William J. 3	<ul> <li>learning outcomes. Show evidence of analytical and critical abilities and logical I apply knowledge to familiar and some unfamiliar situations. Demonstrate effect attention to thoughtful and reflective thinking.</li> <li>Demonstrate general but incomplete command of knowledge and skills require outcomes. Show evidence of some analytical and critical abilities and logical thin familiar situations. Apply moderately effective presentational skills. Little evidence thinking.</li> <li>Demonstrate partial but limited command of knowledge and skills required for att. Show evidence of some coherent and logical thinking, but with limited analyti integration. Show limited ability to apply knowledge to solve problems. Apply limit of attention to thoughtful and reflective thinking.</li> <li>Demonstrate little or no evidence of command of knowledge and skills required to a fattention to thoughtful and reflective thinking.</li> <li>Demonstrate little or no evidence of command of knowledge and skills required to a fattention to thoughtful abilities, logical and coherent thinking. Show very problems. Organization and presentational skills are minimally effective or ineffectack: Essentials of Conservation Biology (Sinauer, 2006, 4th ed.)</li> <li>Conservation biology [electronic resource]: foundations, concepts, er and J.P. Gibbs: Fundamentals of Conservation Biology (Blackwell)</li> </ul>	thinking, integration of ma ctive presentational skills. ed for attaining most of f nking, and ability to apply e of clear attention to thou aining some of the course ical and critical abilities a ted effectiveness in present d for attaining the course little or no ability to apply tive. applications (Spring II, 2007, 3rd Ed)	terials and ability t Evidence of clear the course learning knowledge to mos ghtful and reflectiv learning outcomes ind little attempt a ntational skills. Lac learning outcomes knowledge to solv			

BIOL2614 Environm	Academic Year	2012				
Offering Department	Biological Sciences	Quota	80			
Course Co-ordinator	Dr J D Gu, Biological Sciences					
Course Aim	To introduce students to the basic principles of environmental and ecological toxicology by analysis of the fate of pollutants in lithosphere, hydrosphere, atmosphere and biosphere. Mechanisms of toxicity as dose-response will be analyzed through adsorption, metabolism, toxicity and elimination. Major metabolic processes and enzymes involved will be highlighted. Specific cases of toxicity will be presented and discussed.					
Course Contents	1. Environmental chemistry of pollutants and their toxicity and factors governi	ng toxic effects, bio	accumulation and			

	<ul> <li>biomagnification</li> <li>2. Partitioning and transformation of environmental pollutants</li> <li>3. Quantitative toxicology using dose-response approaches</li> <li>4. Emerging endocrine-disrupting chemicals and carcinogens at molecular levels</li> <li>5. Elimination of pollutants form the environments</li> <li>6. Laboratory testing of toxicity and review various adsorption isotherm models</li> </ul>						
Learning Outcomes	<ul> <li>understar</li> <li>understar</li> <li>understar</li> <li>understar</li> </ul>	On successful completion of this course, students should be able to: - understand fate and distribution of chemicals in various compartments of the ecosystem - understand toxicity through adsorption, metabolism, elimination and target site and quantitative analysis - understand mechanism of toxicity from specific pollutants of choice - understand specific biochemical processes and enzymes involved in pollutants transformation and mineralization - understand appropriate techniques in environmental cleaning up					
Pre-requisites	Pass in BI	DL2606 or CHEM1007 or CHEM1009 or CHEM2102 or EASC0118	or EASC1122				
Offer in 2012 - 2013	1st sem		Examination	Dec			
Offer in 2013 - 2014	Υ						
Teaching Hours	24 lectures	; 36 hours of laboratory, assignment; and seminar					
Assessment Method		ur MCQ and written answer examination (60% weighting) and Student-based assessment includes laboratory report, assignment					
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	C General but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Gene but incomplete grasp of the subject. Evidence of some analytical and critical abilities and logical thinking. Apply moderate effective lab skills and techniques. Mostly correct but some erroneous use of data and results to draw appropriate conclusion 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 limited grasp, with retention of some relevant information, of the subject. Evidence of some coherent and logical thinking, with limited analytical and critical abilities. Partially effective lab skills and techniques. Limited ability to use data and result 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.						
Textbooks	D.G. Crost	y: Environmental Toxicology and Chemistry (Oxford, 1998)					
References		, J.J. Morgan: Aquatic Chemistry: Chemical Equiibria and Rates in N and JD. Gu: Environmental Microbiology (Wiley-Blackwell, 2009, 2		ey, 1995, 3rd ed.)			
Course Website	http://www	biosch.hku.hk/ecology/lsc/biol2614/					
Remarks	The course	e will be offered subject to a minimum enrollment number.					

BIOL2615 Freshwate	er ecology (6 credits)	Academic Year	2012
Offering Department	Biological Sciences	Quota	40
Course Co-ordinator	Prof D Dudgeon, Biological Sciences		
Course Aim	This course introduces freshwater science by integrating the physical and b drainage basins in the context of sustaining human livelihoods and biodive lakes and maintenance of water quality are considered also. Case studies river science and human use of drainage basins. Emphasis will be pla biodiversity in Asia in the context of increasing human modification of ecos scarcity.	sity. Conservation and are used to illustrate ced upon conservation	management of the principles of n of freshwater
Course Contents	The amount of water on Earth is fixed. Less than 0.01% of the world's wa hosts 10% of the Earth's species. Global water use has increased 300% si Earth's population; many people in Asia already face water stress. This of processes involved in the hydrological cycle and flow of water in draina fluctuations, and describes the main longitudinal changes that occur alor flows in freshwater ecosystems are described with particular reference to and land and the relative importance of aquatic primary production versus the land. The range of organisms associated with Asian fresh waters ar explained, and students will become familiar with some common Hong Kor on freshwater ecosystems and the role they play in sustaining livelihoods and consequences of human modification of fresh waters, and the im biodiversity. Finally the range of management strategies used to reduce on ecosystems and maintain water quality are introduced.	ace 1950 and is growin course introduces the p age basins, as well as ing rivers and their floo he transfer of materials energy derived from de introduced and their g species. The depend is explained, together bilications for conserva-	g faster than the physicochemical s their seasonal dplains. Energy s between water trital inputs from functional roles lence of humans with the causes ation of aquatic
Learning Outcomes	On successful completion of this course, students should be able to: - Describe the hydrological cycle, and understand the main sources and p the importance of land-water interactions in determining aquatic productivity - Describe the composition of the freshwater biota (major groups) and their and identify some of the common animals that occur in Hong Kong fresh wa - Describe the results of modification of freshwater ecosystems by huma biodiversity in Asia, explain why freshwater biota are vulnerable to human	functional roles in aqua ters. ns, list the main threa	atic ecosystems

	strategies	strategies used to reduce or mitigate them.						
Pre-requisites	Pass in (B	Pass in (BIOL0601 or BIOL0600 or BIOL0625) and BIOL0604						
Offer in 2012 - 2013	1st sem	1st sem Examination Dec						
Offer in 2013 - 2014	Y	Y						
Teaching Hours	At least 26	hours of lectures, plus up to 40 hou	rs of project work and field tri	ps to local streams ar	nd wetlands.			
Assessment Method		r written examination (70% weightin (30% weighting)	g) and continuous assessme	nt of coursework, pro	ject report, and/or			
Course Grade	A+ to F							
Grade Descriptors	A	Evidence of original logical (or coherent) t demonstrated by background reading ar analytical skills and/or lab/field skills, and or outstanding (for A+) work relative to what	d excellent use of named (organis substantial knowledge of general fre	sm) examples. Show exc	ellent presentational,			
	В	B Evidence of analytical (or critical) abilities and logical (or coherent) - but not necessarily original - thinking, a good grasp of the subject as demonstrated by background reading and use of named (organism) examples. Show good presentational, analytical and/or lab/field skills, and knowledge of general freshwater biodiversity or selected taxa. Work more than sufficient for what is required at degree level.						
	С	C Evidence of some analytical (or critical) abilities and logical (or coherert) thinking with an adequate (but incomplete) grasp of the subject, but little or no evidence of original thinking, with limited background reading and use of named (organism) examples. Show fair presentational, analytical and/or lab/field skills, and some knowledge of general freshwater biodiversity or selected taxa. Work sufficient for what is required for degree level.						
	D	Evidence of retention of a minimum of relevant information of the subject (i.e. knowledge is very incomplete), with limited organizational, analytical or presentational skills. Shows insufficient evidence of background reading, or familiarity with lab/field techniques or freshwater biodiversity. Work merely (for D+) or barely (D) adequate for what is required at degree level.						
	Fail	Evidence of poor or inadequate knowled and/or excessive irrelevancy. Little or no knowledge of freshwater biodiversity. Work	vidence of familiarity with relevant r	ct, and a lack of coherence eading material and lab/fie	ce, poor organization Id techniques, or any			
Textbooks	The Mekor developed	Allan, J.D. & Castillo, M.M. (2007). Stream Ecology. Springer. The Mekong River Awareness Kit (RAK:http://mekong.riverawarenesskit.org/html/rak_frameset.html) A training too developed by an international team (including the course coordinator) that contains information on the physical and biological features of rivers, and shows how human livelihoods depend on river health.						
References	A list of ref	erences available in HKU library will	be provided for each lecture.	•				
Course Website	http://ecolo	gy.hku.hk/vsb/lsc/biol2615/ModHom	ie.htm					
Remarks	More infor at the Lear http://www	h BIOL2608 and BIOL2615 are reco nation about this course, including ning Support Centre: biosch.hku.hk/ecology/lsc/biol2615/ e will be offered subject to a minimu	details of contents, assessme	ent, aims and objectiv	ves, can be found			

BIOL2617 Experime	ntal intertidal ecology (6 credits)	Academic Year	2012					
Offering Department	Biological Sciences	Quota	40					
Course Co-ordinator	Prof G A Williams, Biological Sciences							
Course Aim	To examine the communities of coastal systems: their distribution, composition and the factors which regulate them. This course will examine, using an experimental approach, patterns exhibited by a range of shores and the deterministic and stochastic processes that create and sustain them. Hong Kong shores will be used as examples but comparisons will be drawn from the coastlines of the world.							
Course Contents	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.							
Learning Outcomes	<ul> <li>On successful completion of this course, students should be able to:</li> <li>- 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)</li> <li>- understand the factors limiting species distribution patterns on the vertical intertidal gradient and 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 processes (e.g., herbivory, competition) in intertidal areas</li> <li>- explain the role of biological processes (e.g., predation, succession) and their interaction with the physical environment in shaping intertidal communities</li> <li>- plan, design, execute, analyse and present a simple experimental study on intertidal ecology.</li> </ul>							
Pre-requisites	Pass in BIOL0126 or BIOL0603 or BIOL0604 or BIOL0625 or BIOL1608 or B	OL2608 or ENVS10	02					
Offer in 2012 - 2013	2nd sem	Examination	Мау					
Offer in 2013 - 2014	Υ							
Teaching Hours	24 lectures and 36 hours field trips/project work							
Assessment Method	One 2-hour written examination (60% weighting) and assessed work (40% we	eighting)						
Course Grade	A+ to F							

Grade Descriptors	A	Evidence of original, logical (or coherent) thought, strong analytical and critical abilities and a thorough grasp of the subject as demonstrated by background reading and excellent use of named (organism) examples. Show excellent presentational, analytical skills and/or lab/field skills, and demonstrate substantial knowledge of general intertidal ecology and excellent experimental design and analysis skills.
	В	Evidence of analytical (or critical) abilities and logical (or coherent), but not necessarily original, thinking, a good grasp of the subject as demonstrated by background reading and use of named (organism) examples. Show good presentational, analytical and/or lab/field skills, and demonstrate knowledge of general intertidal ecology and good experimental design and analysis skills.
	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 coherence, poor organization and/or excessive irrelevancy. Limited or no evidence of familiarity with relevant reading material and lab/field techniques, or knowledge of general intertidal ecology, and misuse of experimental design and analysis skills.
Textbooks		B. & Morton, J.: The Seashore Ecology of Hong Kong (Hong Kong University Press, 1983) & Williams, G.A. & Trowbridge, C.D.: The Biology of Rocky Shores (Oxford University Press, 2009)
References	TBC	
Course Website	http://eco	ology.hku.hk/vsb/lsc/biol2617/ModHome.htm
Remarks	The cou	rse will be offered subject to a minimum enrollment number.

BIOL2619 Terrestria		•						•	00
Offering Department	Biological	I Scienc	ices					Quota	30
Course Co-ordinator	TBC, Biolo	TBC, Biological Sciences							
Course Aim	To enable ecology.	To enable motivated students to acquire the knowledge and skills needed to solve real problems in terrestrial ecology.							
Course Contents	East Asia, first learn a terrestrial including h half of the ecological other majo The course of the cours surveys, b	This course will focus on the ecology of terrestrial habitats. The emphasis will be on the tropics, especially tropical East Asia, but the course will also include an overview of patterns and processes on a global scale. Students will first learn about the geological history of the land mass on earth, the biogeography and broad distribution of major terrestrial ecosystems in Tropical East Asia. Then, students will begin to learn different important processes including herbivory, carnivory, pollination, seed dispersal and energy flow in terrestrial ecosystems. The second half of the course will start with the degraded terrestrial ecosystems nowadays and the important process of ecological succession. Restoration ecology and how tropical forests can be restored will then be introduced. Two other major threats to terrestrial ecosystems including alien invasive species and wildfire will also be addressed. The course content is delivered by lectures as well as problem-based learning exercises. The practical component of the course will introduce students to the basic field techniques used in terrestrial ecology, including vegetation surveys, bird community studies, small mammal trapping, the use of infrared-triggered cameras to survey larger mammals, radio-tracking, and methods for quantifying invertebrate abundance.							
Learning Outcomes	- Understa - Understa methods to - Plan and	On successful completion of this course, students should be able to: - Understand the patterns and processes of terrestrial ecosystems in their pristine form and disturbed state. - Understand the various threats to terrestrial ecosystems, methods to reduce the impact of those threats, and methods to manage and restore degraded terrestrial ecosystems. - Plan and conduct baseline study of terrestrial biodiversity. - Develop the skill to be an active learner through the problem-based learning exercises.							
Pre-requisites	Pass in Blo	BIOL060	04 or BIOL06	05 or BIOL	0625 or BIC	L0600 or B	IOL0603 or E	NVS1002	
Offer in 2012 - 2013	Not offered	əd						Examination	To be confirme
Offer in 2013 - 2014	Y								
Teaching Hours	24 hours le	lecture	es, 14 hours t	utorials, 16	hours labor	atory and fi	eld work and 7	0 hours reading/se	elf study
Assessment Method	One 2-hou	our writte	ten examinat	ion (50% w	eighting) an	d assessme	ent of course v	vork (50% weightin	g)
Course Grade	A+ to F								
Grade Descriptors	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, ability to integrate and synthesize information, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective presentational skills. Strong evidence of clear attention to thoughtful and reflective thinking.								
	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, integration of materials and ability trapply knowledge to familiar and some unfamiliar situations. Demonstrate effective presentational skills. Evidence of clear attention to thoughtful and reflective thinking.								
	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 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.								
Textbooks	Corlett R.T	T · The		Tropical Er	et Acia (Ov	ord Univer	sity Proce 200	10)	

References	To be provided in classes
Course Website	http://www.biosch.hku.hk/ecology/lsc/biol2619/
Remarks	The course will be offered subject to a minimum enrollment number.

BIOL2621 Plant stru	cture & evo	olution (6 credits)	Academic Year	2012					
Offering Department	Biological S	Sciences	Quota	60					
Course Co-ordinator	Prof R M K	Saunders, Biological Sciences							
Course Aim	significance	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	explanation Information taxonomic	e will investigate various cell, tissue and organ types in the is for their diversity and discussions of the value of such knowle on plant structure will be integrated with our current understa relationships derived from molecular phylogenetic research. To uction, growth and development, pollination, fertilization, fruit and ed.	dge in understanding inding of developmer opics such as food s	plant phylogeny. tal genetics and torage, strength,					
Learning Outcomes	<ul> <li>recognise</li> <li>the xylem a</li> <li>describe</li> <li>describe</li> <li>integrate</li> <li>describe</li> <li>from the flo</li> </ul>	now seeds develop after fertilization of the ovule, and how dif	onset of secondary g structures (wood and volution of organ dive nise how these struct	rowth. bark). rsity. ures are derived					
Pre-requisites		DL0604; and dents who have already passed in BIOL2616 before.							
Offer in 2012 - 2013	2nd sem		Examination	Мау					
Offer in 2013 - 2014	Y								
Teaching Hours	24 lectures	and 36 hours of laboratory and student-centred learning							
Assessment Method	One 2-hour	r written examination (80% weighting), and continuous assessme	nt (20% weighting)						
Course Grade	A+ to F								
Grade Descriptors	A	Demonstrate thorough mastery at an advanced level of extensive knowledge learning outcomes, with evidence of extensive background reading and use of critical abilities and logical thinking. Apply highly effective presentation skills. D draw appropriate and insightful conclusions.	named examples. Show ev	vidence of significant					
	В	Demonstrate substantial command of knowledge required for attaining most of some background reading and use of named examples. Show evidence of criti presentation skills. Demonstrate use of data and results to draw appropriate and	cal abilities and logical thir						
	С	Demonstrate general but incomplete command of knowledge and skills requ outcomes, with evidence of limited background reading and use of named exa and logical thinking. Apply moderately effective presentation skills. Demonstrate appropriate and insightful conclusions.	mples. Show evidence of a	some critical abilities					
	D	Demonstrate partial but limited command of knowledge and skills required for a with insufficient evidence of background reading and use of named examples logical thinking. Apply limited presentation skills. Demonstrate limited ability to insightful conclusions.	. Show evidence of limited	critical abilities and					
	Fail	Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes, with							
Textbooks		Anatomy of Flowering Plants, 3rd ed. Cambridge Univ. Press (200 n, R.F. Evert & S.E. Eichhorn: Biology of Plants, 7th ed. Freeman							
References	A list of add	ditional reading material will be provided during the course.							
Course Website	http://www.	biosch.hku.hk/ecology/lsc/biol2621/							

BIOL2622 The biolog	gy of marine mammals (6 credits)	Academic Year	2012
Offering Department	Biological Sciences	Quota	30
Course Co-ordinator	Dr L Karczmarski, Biological Sciences		
Course Aim	Few other groups of animals have captured the public's imagination the way and dolphins have. This course covers the evolutionary biology, ecology, bef mammals: whales, dolphins and porpoises (cetaceans), seals, sea lions, fi manatees and dugongs (sirenians). Students will learn to understand the ecol environment, their role in the marine ecosystem, their behavioural complexity, these animals in the human-dominated world.	naviour, and conserv ur seals and walrus ogy of mammalian li	vation of marine ses (pinnipeds), fe in the aquation
Course Contents	The course begins with an overview of marine mammal species and their glol of the various adaptations that have evolved to meet the challenges of the m		

Learning Outcomes       On successful completion of this course, students should be able to: <ul> <li>appreciate marine mammals adjustive and function in an aquate environment and their role in the marine ecosystem.</li> <li>understand how mammals adjustive and function in an aquate environment and their role in the marine ecosystem.</li> <li>understand and appreciate the complexity of interactions between environmental selective pressures and marine mammals hardword in terms of behavioural and ecological needs, anthropogenic impacts and the rapidly changing global marine environment.</li> </ul> <li>Pre-requisites</li> <li>Pass in BIOL0600 or BIOL0600 or BIOL0600</li> <li>Offer in 2012 - 2013</li> <li>1st sem</li> <li>Z4 lectures and 36 hours of field trips and project work/seminard/student-centred learning</li> <li>Assessment Method</li> <li>One 2-hour written examination (50% weighting) and continuous assessment of coursework, semi-ars and project reports (30% weighting), and class tests/other assignments (20% weighting)</li> <li>Course Grade</li> <li>A to F</li> <li>Evidence of a thorough grasp of the subject in a broader comparative prespection to usua sequence to a dispendent critical though twitt excellent and and legical conclusors. Show ageness to learn, great abilities of independent critical though twitt excellent on usuandity over feature or write required at degree level.</li> <li>C appreciate an adjust the order and biological conclusors. Show ageness to learn, great abilities of independent work, defence presentation skills with good analytical and menation. Write arguing and legical conclusors. Show ageness to learn, great abilities of independent work, defence presention skills with good analytical and spreciate a demonstrated by some background reading and apprepriate use of a proof grasp of the subject to draw meaningful and legical conclusors. Now a</li>		highlighting followed by ranging be and social influences review of c of population mammal po- current soci independent	the life history, reproductive strategies, ecology and popula the similarities and differences between species in this taxonom v sessions on behaviour and behavioural ecology; here we d haviour, foraging strategies, grouping pattern and social behavi strategies that guide the daily lives of these animals. The course on the fate of marine mammals, examples of critically endang onservation and management strategies; our emphasis is on the on ecology, behaviour and behavioural ecology in ensuring long opulations. This course is designed for 2nd and 3rd year studen entific research, recent discoveries and innovative research at literature-searches and will discuss their projects during clas and analytical approaches to science.	ically diverse group of iscuss animal mover our, behavioural com- concludes with a disc ered species and poc importance of applyii -term effective conse is; it includes field trip techniques. Student:	of animals. This is nent, diving and plexity, cognition, cussion of human pulations, and a ng the knowledge rvation of marine os, discussions of s will undertake					
Offer in 2012 - 2013         1st sem         Examination         Dec           Offer in 2013 - 2014         Y         Teaching Hours         24 lectures and 36 hours of field trips and project work/seminars/student-centred learning         Assessment Method         One 2-hour written examination (50% weighting) and continuous assessment of coursework, seminars and project reports (30% weighting), and class tests/other assignments (20% weighting)         Course Grade         A+ to F           Grade Descriptors         Evidence of a thorough grasp of the subject in a broader comparative perspective as demonstrated by background reading and excellent use of named examples and case studies. Evidence of independent oricle thought with excellent use of named examples and case studies. Evidence of independent oricle thought with excellent or outstanding work relative to what is required at degree level.           B         Evidence of a good grasp of the subject as demonstrated by some background reading and appropriate use of named examples and case studies. Evidence of good critical thrught, although not necessarily original. Good and very good of one and to capitred and togeta level.           C         B         Evidence of a good grasp of the subject as demonstrated by some background reading and initied to degree level.           C         B         Evidence of a good grasp of the subject or any initial studies of any initial studies of any initial studies. Evidence of good critical thrught, although not necessarily original. Good and very good original conclusions. Work more than sufficient or independent; only partial abilities of any initial studies of any initin a tany initial and initide to the most basic concepts,	Learning Outcomes	<ul> <li>appreciation</li> <li>understa</li> <li>understa</li> <li>mammal boostication</li> <li>appreciation</li> <li>think analignment</li> </ul>	In successful completion of this course, students should be able to: appreciate marine mammal diversity and biogeography. understand how mammals adapt and function in an aquatic environment and their role in the marine ecosystem. understand and appreciate the complexity of interactions between environmental selective pressures and marine nammal behaviour, population structure and demography. appreciate the socio-ecological diversity and behavioural complexity of marine mammals. think analytically in terms of behavioural ecology, animal socio-behavioural and ecological needs, anthropogenic							
Offer in 2013 - 2014         Y           Teaching Hours         24 lectures and 36 hours of field trips and project work/seminars/student-centred learning           Assessment Method         One 2-hour written examination (50% weighting) and continuous assessment of coursework, seminars and project reports (30% weighting), and class tests/other assignments (20% weighting)           Course Grade         A+ to F           Grade Descriptors         Evidence of a thorough grasp of the subject in a broader comparative parspective as demonstrated by background reading and excellent use of named axamples and case studies. Evidence of independent with sociellent use of a long drage of fundamental concepts to draw insplutious ins. Show exegenress to learge fundamental concepts to draw insplutious shills with excellent analytical and pagements to constanting and examples and case studies. Evidence of good critical thought, although not necessarily original. Good and verg good that is required at degree level.           B         Evidence of a good grasp of the subject as demonstrated by some background reading and appropriate use of named examples and case studies. Evidence of good critical thinking, but not necessarily original. Good and verg good to a source analytical and indicat argumentation. Cood 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 cuberent and incomplete grasp of the subject, with limited background reading and limited for degree level.           C         Demonstrate some grasp of the subject and understanding of locical argumentation and restricted ability of drawing appropriate c	Pre-requisites	Pass in BIC	0L0604 or BIOL0605 or BIOL0600							
Teaching Hours         24 lectures and 36 hours of field trips and project work/seminars/student-centred learning           Assessment Method         One 2-hour written examination (50% weighting) and continuous assessment of coursework, seminars and project reports (30% weighting), and class tests/other assignments (20% weighting)           Course Grade         A+ to F           Grade Descriptors         Evidence of a thorough grasp of the subject in a broader comparative perspective as demonstrated by background reading and independent work, effective presentation skills with excellent alogical conclusions. Show eagemeess to learn, great abilities of independent work, effective presentation skills with excellent analytical argumentation. Excellent or outstanding work relative to what is required at degree level.           B         Evidence of a good grasp of the subject a demonstrated by some background reading and appropriate use of named examples and case studies. Evidence of good critical thought with sociellan argumentation. Store ethan sufficient and logical argumentations. Work meeting the outper semination skills with good analytical and logical argumentation. Store than sufficient volution work, effective presentation skills with good analytical and logical conclusions. Work meeting with adverting dow draw meaningful and logical conclusions. Work meeting were than sufficient volution work, effective presentation skills with good analytical and logical conclusions. Work meeting were than sufficient volution work, effective presentation skills with good analytical and logical conclusions. Work meeting were than sufficient volutions work, effective presentation skills with good analytical and logical conclusions. Work sufficient or what is required to degree level.           C         Demonstrate an	Offer in 2012 - 2013	1st sem		Examination	Dec					
Assessment Method       One 2-hour written examination (50% weighting) and continuous assessment of coursework, seminars and project reports (30% weighting), and class tests/other assignments (20% weighting)         Course Grade       A+ to F         Grade Descriptors	Offer in 2013 - 2014	Y								
reports (30% weighting), and class tests/other assignments (20% weighting)         Course Grade       A+ to F         Grade Descriptors	Teaching Hours	24 lectures	and 36 hours of field trips and project work/seminars/student-cer	ntred learning						
Grade Descriptors         A         Evidence of a thorough grasp of the subject in a broader comparative perspective as demonstrated by background reading and range of lundamental concepts to draw insightful and logical conclusions. Show eagerness to learn, great abilities of independent work, effective presentation skills with excellent analytical argumentation. Excellent or outstanding work relative to what is required at degree level.           B         Evidence of a good grasp of the subject as demonstrated by some background reading and appropriate use of named examples and case studies. Evidence of good critical thought, athough not necessarily original. Good and very good (but not outstanding) work relative to unstanding) abilities of independent work, effective presentation skills with good analytical and logical conclusions. Work more than sufficient for what is required at degree level.           C         Demonstrate an adequired, but not coherent and incomplete grasp of the subject, with limited background reading and limited use of named examples and case studies. Science abilities of idependently on the instightful and/or independent; only parial abilities to use oquired knowledge and work independently on the instightful and/or independent; only parial abilities to use oquired knowledge and work independently on the instightful and/or independent; only effective presentation skills with mostly correct argumentation, but limited (or no abilities to integrate broader concepts. Work sufficient for what is required at degree level.           D         Demonstrate some grasp of the subject, but partial and limited to the most basic concepts. Work sufficient for what is required at degree level.           D         No evidence of basic minimum knowledge and unore kading of the subject. No evidence of background reading and	Assessment Method				ninars and project					
A       excellent use of named examples and case studies. Evidence of independent critical thought with excellent use of a broad range of fundamental concepts to draw insightful and logical conclusions. Show eagemess to learn, great abilities of independent work, effective presentation skills with excellent analytical argumentation. Excellent or outstanding work relative to what is required at degree level.         B       Evidence of a good grasp of the subject as demonstrated by some background reading and appropriate use of named examples and 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 aconclusions. 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 neared examples and case studies. Some abilities to logical critical thinking, but not insightful and/or independent vork sufficient for what is required to degree level.         C       Demonstrate an adequate, but not coherent and incomplete grasp of the subject, with meaningful conclusions. Fair presentation skills with generally weak logical argumentation and restricted ability of drawing appropriate conclusions. Work sufficient for what is required to degree level.         D       Demonstrate some grasp of the subject, but partial and limited to the most basic concepts. Work sufficient for what is required to degree level.         Fail       Ne evidence of basic rominum knowledge and understanding of the subject. No evidence of background reading and no familiarity with any relevant examples and case studies. Inadequate	Course Grade	A+ to F								
B       examples and some case studies. Evidence of good critical thought, atthough 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 conclusions. Work more than sufficient for what is required at degree level.         Demonstrate an adequate, but not coherent and incomplete grasp of the subject, with limited background reading and limited tim mostly correct argumentation, but limited (or no) abilities to integrate broader concepts. Work sufficient for what is required tor degree level.         D       Demonstrate some grasp of the subject, but partial and limited to the most basic concepts. Work sufficient for what is required at degree level.         D       Demonstrate some grasp of the subject, but partial and limited abilities of oritical independent thinking, and not particularly effective presentation skills with generally weak logical argumentation and restricted ability of drawing appropriate conclusions. Work harely meets what is required at degree level.         Fail       No evidence of basic minimum knowledge and understanding of the subject. No evidence of background reading initieted to conclusions. Work fails to reach degree level.         Fail       No evidence of basic minimum knowledge and understanding of the subject. No evidence of coherent logical thought; ineffective presentation skills with poor argumentation and restricted ability of conclusi	Grade Descriptors	A	excellent use of named examples and case studies. Evidence of independer range of fundamental concepts to draw insightful and logical conclusions. independent work, effective presentation skills with excellent analytical argume	t critical thought with exce Show eagerness to lear	ellent use of a broad n, great abilities of					
C       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.         D       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 Work barely meets what is required at degree level.         Fail       No evidence of basic minimum knowledge and understanding of the subject. No evidence of background reading and no familiarity with any relevant examples and case studies. Inadequate evidence of coherent logical thought; ineffective presentation skills with poor argumentation and no abilities to draw meaningful conclusions. Work fails to reach degree level.         Textbooks       Hoelzel, A.R. (ed). Marine mammal biology: An evolutionary approach (Blackwell Science, 2002)         Reynolds III, J.E. & Rommel, S.A. (eds). Biology of marine mammals (Smithsonian Institution Press, 1999) Perrin, W.F., Wursig, B. & Thewissen, J.G.M. (eds). Encyclopedia of marine mammals (Academic Press 2008)         Mann, J., Connor, R.C., Tyack, P.L. & Whitehead, H. (eds). Cetacean societies: Field		в	examples and some case studies. Evidence of good critical thought, although (but not outstanding) abilities of independent work, effective presentation skills Good general command of acquired knowledge to draw meaningful and logical	not necessarily original. ( with good analytical and lo	Good and very good ogical argumentation.					
D       case studies. Insufficient evidence of background reading, limited abilities of critical independent thinking, and not particularly effective presentation skills with generally weak logical argumentation and restricted ability of drawing appropriate conclusions. Work barely meets what is required at degree level.         Fail       No evidence of basic minimum knowledge and understanding of the subject. No evidence of background reading and no familiarity with any relevant examples and case studies. Inadequate evidence of coherent logical thought; ineffective presentation skills with poor argumentation and no abilities to draw meaningful conclusions. Work fails to reach degree level.         Textbooks       Hoelzel, A.R. (ed). Marine mammal biology: An evolutionary approach (Blackwell Science, 2002) Reynolds III, J.E. & Rommel, S.A. (eds). Biology of marine mammals (Smithsonian Institution Press, 1999) Perrin, W.F., Wursig, B. & Thewissen, J.G.M. (eds). Encyclopedia of marine mammals (Academic Press 2008) Mann, J., Connor, R.C., Tyack, P.L. & Whitehead, H. (eds). Cetacean societies: Field		с	use of named examples and case studies. Some abilities of logical critical thin partial abilities to use acquired knowledge and work independently to draw n with mostly correct argumentation, but limited (or no) abilities to integrate broad	king, but not insightful and/ leaningful conclusions. Fai	or independent; only ir presentation skills,					
Fail       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.         Textbooks       Hoelzel, A.R. (ed). Marine mammal biology: An evolutionary approach (Blackwell Science, 2002) Reynolds III, J.E. & Rommel, S.A. (eds). Biology of marine mammals (Smithsonian Institution Press, 1999) Perrin, W.F., Wursig, B. & Thewissen, J.G.M. (eds). Encyclopedia of marine mammals (Academic Press 2008) Mann, J., Connor, R.C., Tyack, P.L. & Whitehead, H. (eds). Cetacean societies: Field		D	case studies. Insufficient evidence of background reading, limited abilities of c effective presentation skills with generally weak logical argumentation and rest	ritical independent thinking	, and not particularly					
Science, 2002) Reynolds III, J.E. & Rommel, S.A. (eds). Biology of marine mammals (Smithsonian Institution Press, 1999) Perrin, W.F., Wursig, B. & Thewissen, J.G.M. (eds). Encyclopedia of marine mammals (Academic Press 2008) Mann, J., Connor, R.C., Tyack, P.L. & Whitehead, H. (eds). Cetacean societies: Field		Fail	familiarity with any relevant examples and case studies. Inadequate evid	ence of coherent logical	thought; ineffective					
Remarks The course will be offered subject to a minimum enrollment number.	Textbooks	Science, 20 Reynolds I Perrin, W.F mammals ( Mann, J., 0	Science, 2002) Reynolds III, J.E. & Rommel, S.A. (eds). Biology of marine mammals (Smithsonian Institution Press, 1999) Perrin, W.F., Wursig, B. & Thewissen, J.G.M. (eds). Encyclopedia of marine mammals (Academic Press 2008) Mann, J., Connor, R.C., Tyack, P.L. & Whitehead, H. (eds). Cetacean societies:							
	Remarks	The course	will be offered subject to a minimum enrollment number.							

BIOL2625 Animal be	ehaviour (6 credits)	Academic Year	2012
Offering Department	Biological Sciences	Quota	30
Course Co-ordinator	Dr L Karczmarski, Biological Sciences		
Course Aim	The science of Animal Behaviour investigates everything animals do; it involve underlying mechanisms and functions; exploring the ways in which animals physical environment and other organisms; how animals find and defend r mates, reproduce, and care for their young; how complex animal societies a individual affects the structure of a population. This course will provide a con- understanding animal behaviour.	interact with each resources, avoid pre re formed and how	other, with their edators, choose behaviour of an
Course Contents	This course will introduce students to scientific reasoning and conceptual be behaviour and behavioural ecology. What causes specific behaviour and wh How does behaviour develop within the individual's lifetime and what function are some species monogamous while others are polygamous? What makes o the hunted? Several animal species, including humans, tend to live in gro complex and effective survival strategy. However, how could, for instance, the be explained through an evolving mechanism which emphasizes the reproduce as possible? Why, among animals living in small groups like squirrels, would the rest of the group? In this course, based upon ecological and evolutionary p	at are the underlyin ns does it serve? For one organism the hui ups; social life is a e birth of sterile casi tive success of as r an individual risk its	g mechanisms? or example; why nter and another mong the most tes, like in bees, nany individuals own life to save

	within the paradigm of behavioural ecology and understand the causes, functions, development, and evolution of behaviour. We will discuss several classical studies that form the foundation of this field, as well as more recer research that represents the current concepts which have led to modern understanding of animal behaviour. W will also illustrate the links between the recent extraordinary advances in behavioural ecology and socio-ecolog with their application in animal conservation.						
Learning Outcomes	<ul> <li>Learn to</li> <li>Appreci</li> <li>Learn to</li> <li>basis for</li> <li>Appreci</li> <li>framewor</li> <li>Think</li> </ul>	o appreciate iate the con the scientific modern un iate the cor rk into prac analytically	e the causes, fu mplexity of intera ic reasoning and iderstanding of a nceptual framew trice of collecting y in terms of	urse, students should l inctions, development, actions between enviro d methodology in the f animal behaviour work for investigating a g and analysing data behavioural ecology, g given species contribu	and evolution of ani nmental selective pri ield of Animal Beha Ind understanding a animal socio-beha	ressures and anima viour, and current unimal behaviour ar avioural complexity	theories that form nd how to put this
Pre-requisites	Pass in E	BIOL0604 o	or BIOL0625				
Offer in 2012 - 2013	1st sem					Examination	Dec
Offer in 2013 - 2014	Y						
Teaching Hours	22 hours	of lectures	and 32 hours o	of project work / semina	rs / student-centred	learning	
Assessment Method		our written ents (50%)	n examination (	(50%) and continuous	assessment of se	eminars, project re	ports, and other
Course Grade	A+ to F						
Grade Descriptors	Evidence of a thorough grasp of the subject in a broader comparative perspective as demonstrated by background reading and excellent use of named examples and case studies. Evidence of independent critical thought with excellent use of a broad range of fundamental concepts to draw insightful and logical conclusions. Show eagerness to learn, great abilities of independent work, effective presentation skills with excellent analytical argumentation. Excellent or outstanding work relative to what is required at degree level.						
	<ul> <li>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.</li> </ul>						
	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.						
	D	case stud effective	dies. Insufficient evi presentation skills v	the subject, but partial and idence of background readin with generally weak logical a equired at degree level.	g, limited abilities of criti	cal independent thinking	g, and not particularly
	Fail	familiarity	y with any relevan	num knowledge and unders tt examples and case stud argumentation and no abilitie	lies. Inadequate eviden	ce of coherent logical	thought; ineffective
Textbooks	Bolhuis J Publishin		deau L.A. (2005	5). The Behavior of Ar	nimals: Mechanisms	, Function, and Ev	olution. Blackwell
	Danchin	E., Giraldea	au L-A. & Cezill	y F. (2008). Behaviour	al Ecology. Oxford	University Press.	
	Dugatkin	, L.A. (2009	9). Principles of	Animal Behavior (2nd	edition). W.W. Nor	ton & Company	
Remarks	The cour	rse will be o	offered subject to	o a minimum enrollmer	nt number.		

BIOL3214 General v	irology (6 credits)	Academic Year	2012
Offering Department	Biological Sciences	Quota	40
Course Co-ordinator	Dr B L Lim, Biological Sciences		
Course Aim	This Course provides the fundamental principles of virology so that stumajor viral diseases that affect animal health. The course will prepare virology, medicine and biotechnology.		
Course Contents	<ul> <li>Fundamental Virology</li> <li>Classification and Nomenclature of Viruses</li> <li>Virus structure: Capsid symmetry, Icosahedral symmetry</li> <li>Virus structure: Genetic Materials, Nucleocapsid, Envelope</li> <li>Virus entry: Receptors, uncoating and fusion</li> <li>Virus-Cell interaction</li> <li>RNA viruses: Genome replication and mRNA production</li> <li>Baltimore Class IV (+) s.s. RNA viruses: Picornaviruses</li> <li>Baltimore Class V (-) s.s. RNA viruses: Myxoviruses</li> <li>Ambisense RNA viruses: Bunyaviruses and Arenaviruses</li> <li>Ambisense RNA viruses: Bunyaviruses and Arenaviruses</li> <li>Alt. Baltimore Class VI (+) s.s. RNA viruses: Reoviruses</li> <li>Baltimore Class III d.s. RNA viruses: Adenoviruses, Herpesviruse</li> <li>Baltimore Class II d.s. DNA viruses: Parvoviruses</li> <li>Baltimore Class II s.s. (+) DNA viruses: Parvoviruses</li> <li>Kuriuses as Tools in Medicine and Biotechnology</li> <li>Practical Virology</li> </ul>	25	

	<ol> <li>Specimen Collection, Transportation and Processing, Quality Assurance &amp; Laboratory Safety</li> <li>Virus isolation, propagation and titration</li> <li>22. Virus Identification: Immunocytochemical assays, ELISA, Complement Fixation Assay, Hemagglutination and HI assays</li> <li>23. 24. Neutralization assay and Antiviral assay</li> </ol>						
Learning Outcomes	- be famili and the m - gain har	ar with virus classi odes of replication d-on experiences of	fication.				
Pre-requisites	Pass in B	OL2303 or BIOL22	205 or BIOC2603 or	BIOC1003			
Offer in 2012 - 2013	1st sem				Examination	Dec	
Offer in 2013 - 2014	Υ						
Teaching Hours	24 lecture	s; 18 hours of labo	ratory work				
Assessment Method	One 2-ho	ur written examinat	ion (80% weighting)	and continuous assessm	nent of practical work (	20% weighting)	
Course Grade	A+ to F						
Grade Descriptors	A Demonstrate thorough mastery at an advanced level of knowledge required for attaining all the course learning outcomes. Show strong analytical skills and competent ability to acquire knowledge on new development of the subject. Apply highly effective lab skills and techniques. Apply highly effective organizational and presentational skills.						
	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical skills and adequate ability to acquire knowledge on new development of the subject. Apply effective lab skills and techniques. Apply effective organizational and presentational skills.						
	С	outcomes. Show e	vidence of some analyti	and of knowledge and skills r cal skills and certain ability to ls and techniques. Apply mode	acquire knowledge on ne	w development of the	
	D	Show evidence of li	mited analytical skills an	knowledge and skills required f d ability to acquire knowledge ted or barely effective organizat	on new development of the	subject. Apply partially	
	Fail	Lack of analytical s	skills and ability to acqui	and of knowledge and skills re- ire knowledge on new develop ation and presentational skills a	ment of the subject. Apply	minimally effective or	
Textbooks	Flint, Eng	Hewlett: Basic Vir	les of Virology (ASN	/ Press (279.2.P9), 2000 ence (579.2 W132b), 199			
References	твс						
Remarks	The cours	e will be offered su	ubject to a minimum	enrollment number.			

BIOL3219 Clinical m	icrobiology and applied immunology (6 credits)	Academic Year	2012
Offering Department	Biological Sciences	Quota	80
Course Co-ordinator	Dr W Y Lui, Biological Sciences		
Course Aim	The aim is to provide students the knowledge on the practical application biological research, clinical analysis and disease diagnosis.	ons of immunology ar	d microbiology ir
Course Contents	Basic parameters affecting antigen-antibody interactions Application of antigen-antibody interaction in advanced research: immunohistochemistry and dual Immunofluorescence Principles and application of flow cytometry Techniques in cellular immunology and tumor immunology Microbial pathogens and associated diseases, host immune respons resistance, epidemiology and prevention of microbial infections Clinical laboratory analyses in serology, haematology, blood banking, micr	e, antimicrobial agen	ts and multidrug
Learning Outcomes	On successful completion of this course, students should be able to: - Apply the principles of antigen-antibody interaction in various advanced r - Demonstrate knowledge on microbial pathogens, mechanisms for th antibiotic development - Understand the scientific principles of various clinical laboratory analyses - Promote public attention on control of microbial infection and the spread of - Know the organization of medical laboratory in a clinic or hospital	eir disease-causing,	and principles of
Pre-requisites	Pass in BIOL2205		
Offer in 2012 - 2013	2nd sem	Examination	Мау
Offer in 2013 - 2014	Υ		
Teaching Hours	24 lectures and one 4-hour laboratory session per week for 3 weeks		
Assessment Method	One 2-hour written examination (80% weighting) and assessment of practi	cal work (20% weightir	ng)
Course Grade	A+ to F		
Grade Descriptors	Demonstrate thorough mastery at an advanced level of extensive knowled	ge required for attaining al	I the course learning

	A	outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective lab skills and techniques. Critical use of data and results to draw appropriate and insightful conclusions. Apply highly effective organizational and presentational skills.
	В	Demonstrate substantial command of a broad range of knowledge 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 outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply partially effective lab skills and techniques. Limited ability to use data and results to draw appropriate conclusions. Apply limited or barely effective organizational and presentational skills.
	Fail	Demonstrate little or no evidence of command of knowledge required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Apply minimally effective or ineffective lab skills and techniques. Misuse of data and results and/or unable to draw appropriate conclusions. Organization and presentational skills are minimally effective or ineffective.
References	Publishers, Joanne M (McGraw-H	Estridge, Anna P Reynolds, Norma J Walters: Basic Medical Laboratory Techniques (Delmar 4th to latest editons) Willey, Linda M Sherwood, and Christopher J Woolverton: Prescott's Principles of Microbiology lill, 7th edition, 2008, Chapters 31-36, 38) /atson: Introduction to Flow Cytometry (Cambridge University Press, 2004)
Remarks	The course	will be offered subject to a minimum enrollment number.

BIOL3307 Biotechno	ology indu	ustry (6 d	credits)				Academic Year	2012
Offering Department	Biological	al Sciences	3				Quota	40
Course Co-ordinator	TBC, Biolo	ological Sci	ences					
Course Aim			es an overvie peration of biot			f biotechnologies	, the development	of a biotechnology
Course Contents	up, labora quality as	ratory screassurance,	ening and clin good laborate	ical trials, re ory practice,	gulatory ager good manu	ncies, patents and	d intellectual proper	nt of products, scale ties, quality control financial planning
Learning Outcomes	- understa side of bio - understa successfu	tand the te iotechnologistand the i ful biotechr	gy.	he biotechnol for the man hy.	ogy industry, ufacturing of	so that students biotechnology c		erstand the busines: establishment of a
Pre-requisites	Pass in B	BIOL2303	or BIOC2603					
Offer in 2012 - 2013	Not offere	ed					Examination	To be confirmed
Offer in 2013 - 2014	N							
Teaching Hours	36 lecture	res						
Assessment Method	One 2-ho weighting)		examination	(about 80%	weighting); c	continuous asses	sment (tests and e	essays) (about 20%
Course Grade	A+ to F							
Grade Descriptors	A							
	В							
	С							
	D							
	Fail							
References	To be ann	nounced.						
Remarks	The sever	rse will be						

BIOL3315 Animal bi	otechnology (6 credits)	Academic Year	2012		
Offering Department	Biological Sciences	Quota	80		
Course Co-ordinator	Dr A S T Wong, Biological Sciences				
Course Aim	This course discusses the key concepts and principles involved in animal bianimal industry and molecular medicine.	otechnology, and the	eir applications in		
Course Contents	Improvement of animal production through genetic selection and animal insemination and embryo transfer. Application of immunological technique animal reproduction.				

	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. Genetically-modified fish and other animals for food production. Nuclear transfer and animal cloning. 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: genomics, proteomics and bioinformatics; applications of DNA technologies in diagnostic medicine and forensic science; tissue engineering.							
Learning Outcomes	- describe - acquire a	<ul> <li>applications of DIVA technologies in diagnostic medicine and forensic science; tissue engineering.</li> <li>On successful completion of this course, students should be able to: <ul> <li>describe key concepts in animal biotechnology and human health</li> <li>acquire advanced laboratory techniques essential to biotechnology</li> <li>gain insight into real-world applications in biotechnology</li> </ul> </li> </ul>						
Pre-requisites	Pass in B	IOC2603 or BIOL2303						
Offer in 2012 - 2013	2nd sem		Examination	May				
Offer in 2013 - 2014	Y							
Teaching Hours		s; 18 hours of field trips/tutorials/computer sessions. One of nd milt samples from anaestherized goldfish.	the practical sessions invo	lves the collection				
Assessment Method	One 2-ho	ur examination paper (80% weighting), assessment of course	e works (20% weighting)					
Course Grade	A+ to F							
Grade Descriptors	A Demonstrate thorough mastery at an advanced level of extensive knowledge required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational skills. Writings consistently demonstrate informed, thoughtful intellectual engagement with broad range of relevant concepts.							
	B Demonstrate substantial command of a broad range of knowledge required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational skills. Writings mostly demonstrate informed, thoughtful intellectual engagement with broad range of relevant concepts.							
	C Demonstrate general but incomplete command of knowledge required for attaining most of the course learning outcome Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familia situations. Apply moderately effective organizational skills. Writings mostly indicate informed, intellectual engagement wit 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 or analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems Organizational skills are minimally effective or ineffective. Writings reveal an absence of intellectual engagement with concept or theories. Writings are irrelevant or superficial.							
Textbooks	TBC							
References	Glick and	Babiuk and John P. Phillips: Animal Biotechnology: Compreh Pasternak: Molecular Biotechnology (ASM Press, 2003) d readings for each topic will be provided.	ensive Biotechnology (Per	garmon Press)				
		e will be offered subject to a minimum enrollment number.						

BIOL3316 Plant biot	echnology (6 credits)	Academic Year	2012					
Offering Department	Biological Sciences Quota 80							
Course Co-ordinator	Prof M L Chye, Biological Sciences							
Course Aim	This course covers the principles and applications of plant biotechnology. The significance of plant biotechnolog in agriculture and its emerging role in molecular farming for production of biopharmaceuticals and other high-value proteins will be discussed.							
Course Contents	<ul> <li>Tools in plant genetic engineering: promoters, selectable markers transfer: Agrobacterium-mediated transformation, viral vectors, presentation and plastid transformation.</li> <li>Genetic engineering of commercially useful biosynthetic pathway Production of crops resistant to phytopathogens and pests. Herbici Plants as bioreactors for molecular farming: transgenic and transpl biopharmaceutical proteins including growth hormones, antibodies the production of industrial enzymes. Transformed plants in agricular improved phosphorus utilization. Biodegradable plastics. Biofuels.</li> <li>Genetically-modified crops and food products: regulation, testing and particular proteins and products.</li> </ul>	otoplasts, biolistics and micro rs in plants. Posttranscriotion de-resistant crops. astomic plants for the producti s and subunit vaccines. Trans ulture: production of phytases	injection. Nučleai al gene silencing. on of recombinan formed plants foi					
Learning Outcomes	On successful completion of this course, students should be able to - Acquire the key concepts in plant biotechnology - Acquire some laboratory techniques on plant biotechnology - Gain an insight into real-life applications in plant biotechnology	D:						
Pre-requisites	Pass in BIOC2603 or BIOL2303							
Offer in 2012 - 2013	1st sem	Examination	Dec					
Offer in 2013 - 2014	Y							

Assessment Method	One 2-ho	ur written examination (80% weighting) and assessment of laboratory/posters (20% weighting)			
Course Grade	A+ to F	A+ to F			
Grade Descriptors	A	Demonstrate thorough and complete mastery of extensive knowledge and skills required for attaining the learning outcomes in Plant 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	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.			
Textbooks	Chrispeels M.J. and D.E. Sadava: Plants, genes, and agriculture (Jones and Bartlett) Selected papers will be provided.				
References	TBC				
Remarks	The cours	se will be offered subject to a minimum enrollment number.			

BIOL3317 Microbial	DIOTECHNO	ogy (6 credits)	Academic Year	2012					
Offering Department	Biological	Biological Sciences Quota 60							
Course Co-ordinator	Dr J S H T	Dr J S H Tsang, Biological Sciences							
Course Aim	biotechnole the end of	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 valous types of biotechnology products.							
Course Contents	microbial b algae will l limited to p	Upstream and downstream processing will be briefly described to equip the students with the background for microbial biotechnology. The latest advances in microbial expression systems using viruses, bacteria, yeasts and algae will be reviewed. Specific examples on the use of these systems will be provided. These include but not limited to production of recombinant vaccines, secondary metabolites, food and food additives, industrial enzymes and biopesticides as well as bioremediation and medical diagnostics.							
Learning Outcomes	<ul> <li>explain</li> <li>biotechnole</li> <li>understar</li> <li>products</li> <li>describe</li> </ul>	On successful completion of this course, students should be able to: - explain the fundamental biochemical concepts underlying the industrial production of selected microb biotechnology products - understand the importance of the current recombinant technology for large-scale manufacturing of various prot							
Pre-requisites	Pass in Blo	DC2603 or BIOL2303							
Offer in 2012 - 2013	2nd sem		Examination	May					
Offer in 2013 - 2014	Y								
Teaching Hours	24 lectures	and 18 hours of group presentations							
Assessment Method	One 2-hou	r examination paper (70% weighting) and course work assessme	nt (30% weighting)						
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. Demonstrate deep understanding of the subject. Demonstrate integration of the full range of appropriate theories, principles, evidence and techniques. Illustrate insightful use and critical analysis / evaluation of information drawn from a full range of high quality sources and to quote/reference aptly. Apply highly effective organizational and presentational skills.							
	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining most of the course learning outcomes. Demonstrate substantial grasp of the subject. Demonstrate general integration of theories, principles, evidence and techniques. Illustrate critical use of relevant information from sources, showing ability to make meaningful comparisons between different secondary interpretations and to quote/reference aptly. Apply effective organizational and presentational skills.								
	с	Demonstrate general but incomplete knowledge and skills required for attaining most of the course learning outcom							
	D	Demonstrate limited knowledge and skills required for attaining some of the course learning outcomes Demonstrate partial but							
	Fail	Demonstrate little or no knowledge and skills required for attaining the course little or no grasp of the knowledge and understanding of the subject. Show little evidence and techniques. Show limited use of secondary sources and no of presentational skills are minimally effective or ineffective.	or no or inapt integration of	of theories, principles					
Textbooks	Co., 1995)	er and H. Nikaido: Microbial Biotechnology: Fundamentals of Ap ain, J. E. Davies, R. M. Atlas, G. Cohen, C. L. Hershberger, W-S.		N. H. Freeman					

References	TBC	
Remarks	The course will be offered subject to a minimum enrollment number.	

BIOL3321 Biologica	1			Academic Year	2012					
Offering Department	Biological	Biological Sciences Quota 30								
Course Co-ordinator	Prof G A V	Prof G A Williams, Biological Sciences								
Course Aim	To provide experience of biological research by planning and carrying out a project under the supervision of a member of staff.									
Course Contents	course is a	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.								
Learning Outcomes	<ul> <li>Critique a</li> <li>Use this</li> <li>Develop</li> <li>Design a</li> <li>Analyse a</li> <li>Present o</li> <li>Draw an</li> <li>Highlight</li> <li>Submit th</li> </ul>	On successful completion of this course, students should be able to: - 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; and - Present their work as a scientific conference talk.								
Pre-requisites			18 credits of BIOL( d Cumulative GPA	OXXX or BIOL1XXX level cou of 3.0 or above	irses and 18 credits of BIOL	2XXX or BIOL3XX				
Offer in 2012 - 2013	Year long	9			Examination	No Exam				
Offer in 2013 - 2014	Y									
Teaching Hours			ures, attendance of s on the project.	seminars, then supervised p	ractical work. The student she	ould expect to spen				
Assessment Method	A disserta seminar (2			00 words (80% weighting) sl	nould be submitted by April	15th and a researcl				
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 atta majority of learning outcomes. Good critique and knowledge of relevant literature and identification of researc Appropriately designed experimental approach to test research hypothesis. Show good organizational and/or a and laboratory/fieldwork techniques. Demonstrate effective, critical, assessment of results and good presentation work.									
	с	Evidence of adequate understanding and grasp of the subject matter as demonstrated by general but incomplete attainment most of the learning outcomes. Acceptable critique and knowledge of relevant literature and identification of researc								
	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	attaine experi	research work.         Evidence of poor or inadequate understanding and grasp of the subject matter such that most of the learning outcomes attained. Poor critique and knowledge of relevant literature and identification of research hypothesis. Badly dee experimental approach to test research hypothesis. Show little evidence of appropriate organizational and/or analytica and laboratory/fieldwork techniques. Demonstrate incorrect interpretation and assessment of results and poor presentation.							

BIOL3325 Molecular	phylogenetics and evolution (6 credits)	Academic Year	2012					
Offering Department	Biological Sciences Quota 25							
Course Co-ordinator	Dr V Dvornyk, Biological Sciences							
Course Aim	The purpose of this course is to provide a comprehensive overview of state- phylogenetic research, focusing on in depth coverage of the latest techniques in formal lectures is coupled with practical workshops. - acquisition of the sequences from the databases - DNA and protein sequence assembly and alignment - phylogeny reconstruction using parsimony, distance based, and maximum li - introduction to relevant software for phylogenetics - methods for the evaluation of phylogene trees	s. The treatment of t	héoretical issues					
Course Contents	Introduction to molecular systematics and phylogenetics. Tree of life. Obtaining and tissue samples for use in molecular studies. Sources of molecular data studies, taxon sampling and marker choice. Overview of basic laboratory	, experimental desi	gn for molecular					

## School of Biological Sciences

	isolation, PCR, DNA sequencing). Sequence editing and aligning; utilizing public sequence databases. Estimatio 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.							
Learning Outcomes	- Underst - Underst analysis o - Underst	On successful completion of this course, students should be able to: - Understand the fundamental principles of molecular phylogenetics. - Understand the purposes each method is used for and be able to choose the most appropriate method(s) for the analysis of given data. - Understand the advantages and disadvantages of the methods. - Acquire practical skills for the analysis of molecular data.						
Pre-requisites	Pass in B	IOL2303 or BIOL2116 or BIOL2119 or BIOL2611						
Offer in 2012 - 2013	Not offere	d	Examination	To be confirmed				
Offer in 2013 - 2014	Y							
Teaching Hours	24 lecture	es, 36 hours of computer laboratory/tutorial/projects						
Assessment Method	One 2-ho	ur MCQ and written examination (60% weighting), continuous a	ssignments (40%)					
Course Grade	A+ to F							
Grade Descriptors	A apply the relevant theories, principles, and methods taught in 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.							
	C Demonstrate basic knowledge and basic level of skills sufficient for accomplishing most of the goals and expected learning outcomes of the course. Demonstrate general understanding of the subject. Show some ability to combine and to apply theories, principles and methods taught in the course. Basic skills in possession and application of the methods and software for molecular evolutionary analysis of real data. Show general ability to collect, systematize, analyze and evaluate data from various sources and to quote them appropriately. Basic presentational skills.							
	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 required for accomplishing course. Demonstrate very poor or no understanding of the subject. Sho principles, and methods taught in the course. Poor or no skills in possessie molecular evolutionary analysis of real data. Show very poor or no ability to analyze and evaluate them appropriately. Very poor or no presentational sk	w no ability to combine ar on and application of the m collect data from other sour	nd/or to apply theories, ethods and software for				
Textbooks		umar S.: Molecular Evolution and Phylogenetics (Oxford Unive de Easy (Sinauer, 2004, 2nd ed.)	rsity Press, 2000) Hal	I B.G.: Phylogenetic				
References	TBC							
Course Website	http://www	v.biosch.hku.hk/ecology/lsc/biol3321/						
Remarks	The cours	se will be offered subject to a minimum enrollment number.						

BIOL3527 Food safe	ty and quality management (6 credits)	Academic Year	2012
Offering Department	Biological Sciences	Quota	40
Course Co-ordinator	Dr H Corke, Biological Sciences		
Course Aim	To provide exposure to some key management concepts used to succeed in the marketplace. To introduce students to analysis and in food safety management.		
Course Contents	<ul> <li>The regulatory, social and business imperative for food safety.</li> <li>Basic concepts in TQM</li> <li>Statistical Process Control</li> <li>Quality Function Deployment</li> <li>Quality management standards (ISO 9000)</li> <li>Development and implementation of a Hazard Analysis Critical C food safety management system/ supply chain approach)</li> <li>Role of environmental management systems (ISO 14000) in the f</li> <li>Intellectual Property issues in the food industry</li> <li>Religious, ethical, and cultural food choices</li> <li>Illustrative business case studies on food safety management will</li> </ul>	ood industry	thin an ISO 2200 <sup>,</sup>
Learning Outcomes	On successful completion of this course, students should be able to - Understand the historical development of government regulation - Be familiar with a set of management techniques applicable in the - Be able to analyze food production problems and make recomme	of food safety e food industry	quality and safet
Pre-requisites	Pass in BIOL2515		
Offer in 2012 - 2013	1st sem	Examination	Dec
Offer in 2013 - 2014	Υ		
Teaching Hours	24 lectures, 30 hours group project work and 12 hours tutorials/pre	sentations	

Assessment Method	One 2-hour written examination (60% weighting); project and presentation (30% weighting) and continuous assessment (10% weighting)				
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.				
	C Demonstrate general but incomplete grasp of the subject matter covered. Show some evidence of analytical and critical abilities and logical thinking with limited competence in professional-level problem solving. Use quality management skills and techniques and analysis of data and results to draw moderately appropriate but sometimes erroneous conclusions to real-world problems. Demonstrate moderately effective team-based organizational and presentational skills.				
	D Demonstrate partial but limited grasp, with retention of some relevant information, of the subject matter covered. Show some evidence of coherent and logical thinking, but lacking competence in professional-level problem solving. Use quality management skills and techniques and analysis of data and results to draw sometimes appropriate but often erroneous conclusions to real-world problems. Demonstrate team-based organizational and presentational skills of limited effectiveness.				
	Fail Demonstrate little or no grasp, with retention of little relevant information, of the subject matter covered. Show lack of coherent and logical thinking, and minimal competence in professional-level problem solving. Use quality management skills and techniques and analysis of data and results ineffectively, leading generally to inappropriate and usually erroneous conclusions to real-world problems. Demonstrate ineffectiveness team-based organizational and presentational skills.				
Textbooks	Jones, J. M.: Food Safety (Eagan Press, 1992) Mortimore, S. and Wallace, C.: HACCP: A Practical Approach (Chapman and Hall, 1994) Forsythe, S. J.: The Microbiology of Safe Food (2nd Ed., Wiley-Blackwell, 2010)				
References	TBC				
Remarks	The course will be offered subject to a minimum enrollment number.				

	uct development (6 credits)								Academic Year		2012	
Offering Department	Biological Sciences							Quota		40		
Course Co-ordinator	Dr M F Wa	Dr M F Wang, Biological Sciences										
Course Aim									d product de food product	velopment. To pr	ovid	le small grou
Course Contents	developme	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.										
Learning Outcomes	-understan -know the -demonstra -have profe	On successful completion of this course, students should be able to: -understand the food product development cycle -know the key steps in new product development -demonstrate enhanced insight and understanding of current and future trends in the food industry -have professional level practical experience in new product development -know the main characteristics of different sectors of the food industry										
Pre-requisites	Pass in Bl	BIOL2	.2501 oi	r BIOL2	535							
Offer in 2012 - 2013	1st sem									Examination		Dec
Offer in 2013 - 2014	Y											
Teaching Hours	20 lectures	es, ab	about 60	0-80 hoi	urs group	p project	t work					
Assessment Method	One 1-hour written test held in class (20% weighting) plus assessment of group product development project (80% weighting) including in-class presentation											
	weighting)	g) inclu					/eighting)	plus asse	ssment of gro	oup product develop	pme	ent project (80
Course Grade	A+ to F	g) inclu					/eighting)	plus asse	ssment of gro	oup product develo	pme	ent project (80
Course Grade Grade Descriptors	0 0,	De wit	Cluding Demonstr with evide and analy	in-class rate thorough the thor	s presenta ough grasp reative abiliti	of the sub ity and cor sults to dra	bject matte	r covered. Sin professiona ate and insig	now strong anali	vical and critical abilitie solving. Critically use la s to real-world problem	es ar	nd logical thinking ills and technique
	A+ to F	De wit an eff De thi da	Cluding Demonstriwith evide and analy effective to Demonstri thinking widata and	in-class rate thorou ence of cruysis of dat team-base rate subst vith some	ugh grasp reative abiliti ta and resi ed organiza tantial gras evidence o	of the sub ity and cor sults to dra ational and sp of the s of compete enerally a	bject matte mpetence in aw appropri d presentation subject mar ence in profi	r covered. Sl n professiona ate and insig onal skills. tter covered. essional-leve	now strong analy I-level problem s ghtful conclusion Show evidence I problem solving	rtical and critical abilitie	es ar b ski ns. D cal a hniqu	nd logical thinking ills and technique Demonstrate highl bilities and logica ues and analysis d
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Remarks

BIOL3540 Diet, brain	n function and behaviour (6 credits)	Academic Year	2012						
Offering Department	Biological Sciences Quota 40								
Course Co-ordinator	Dr E T S Li, Biological Sciences								
Course Aim	To highlight the impact of nutrient provision on brain structure and function, and to discuss various effects of nutrition and diet on mental function and behaviour.								
Course Contents	Fundamentals of the central nervous system; Nutrition & brain development; Diet, learning & memory function; Dietary CNS stimulants; Neurotransmitters, drugs & behaviour; Physiological and socio-cultural determinants of dietary behaviour.								
Learning Outcomes	On successful completion of this course, students should be - Understand the basic structure and functions of the brain ar influences its development - Be able to explain the consequences of nutrient inadequacy - Understand the differences between bioactive food ingredie - Be able to critically evaluate and interpret the internal and e that determine dietary behaviour	nd how nutrition / on cognition .nts and drugs							
Pre-requisites	Pass in BIOL1514 and BIOL2533								
Offer in 2012 - 2013	Not offered	Examination	To be confirmed						
Offer in 2013 - 2014	Ν								
Teaching Hours	24 hours of lectures, 12 hours of tutorials/group discussions/s	seminars							
Assessment Method	One 2-hour written examination (70% weighting) and continue	ous assessment (30% w	eighting)						
Course Grade	A+ to F								
Grade Descriptors	A								
	В								
	C								
	D								
	Fail								
Textbooks	Copper J. R., Bloom F. E. & Roth R. H.: The Biochemical B 2003) Lieberman H. R., Kanarek R. B. & Prasad C.: Nutritional Neu Nutritional Neuroscience (Journal) Physiology and Behavior (Journal)								
References	TBC								
Remarks	The course will be offered subject to a minimum enrollment n	umber.							

BIOL3621 Fisheries	and maric							2012		
Offering Department	Biological	al Scie	nces					Quota	50	
Course Co-ordinator	Prof Y J Sa	Prof Y J Sadovy, Biological Sciences								
Course Aim	of the cond studies to	Theoretical and practical aspects of marine fisheries and mariculture will be covered to provide an understanding of the condition of global regional and local fishery resources as well as the importance of biological and ecological studies to their management. The role of mariculture in global fish supply will be examined and local fishery and mariculture examples provided.								
Course Contents	enhancem	Fisheries and fishery theory; how do fisheries work? Status of the world's capture fisheries; stock assessment and enhancement; illustrative case studies; fishery management practices; Hong Kong's fishery and management; mariculture-problems and prospects; special topics in fisheries and mariculture; fisheries and conservation.								
Learning Outcomes	<ul> <li>understar</li> <li>appreciat</li> </ul>	On successful completion of this course, students should be able to: - understand of the functioning of fisheries and standards of assessment and development. - appreciate of the mutual dependency of humans and fished populations in relation to their long-term sustainability - Develop the ability for critical and synthetic thinking.								
Pre-requisites	Pass in Bl	BIOL26	607 or ENVS1	002 or BIOL	0126					
Offer in 2012 - 2013	2nd sem							Examination	May	
Offer in 2013 - 2014	Y									
Teaching Hours	24 lectures	es; 36	hours of proje	ct work, stud	dent-centred	learning, p	racticals and	l field visit		
Assessment Method	One 2-hou	our wri	itten exam (60°	% weighting	) and assess	ment of pro	oject work (4	0% weighting)		
Course Grade	A+ to F									
Course Grade							In and a data and	d skills required for attain		

	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 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.
Textbooks	Ltd, 200	J. B. & Reynolds J. D. (eds): Handbook of Fish Biology and Fisheries (Volumes 1 & 2, Blackwell Science 2) reading material will be provided during the course.
References	Will be p	provided during the course.
Course Website	http://wv	wv.biosch.hku.hk/ecology/lsc/biol3621/
Remarks	The cou	rse will be offered subject to a minimum enrollment number.

BIOL3622 Ecologica	al impact as	ssessment (6 credits)	Academic Year	2012			
Offering Department	Biological S	Sciences	Quota	30			
Course Co-ordinator	Prof R S S	Prof R S S Wu, Biological Sciences					
Course Aim		The basic aim of this course is to introduce students to the principles, practices and problems of Ecological Impact Assessment (EcolA).					
Course Contents	selected co Finally, eco based lear	The course will start with the basic principles of environmental impact assessment (EIA) and EIA systems in selected countries and Hong Kong. Then, the principles, methodologies and problems of EcoIA will be introduced. Finally, ecological mitigation and monitoring in EIA projects will be covered. Case studies in the form of problem-based learning exercises and practical work will compliment lectures especially on methodologies and practical problems of EcoIA in Hong Kong.					
Learning Outcomes	- Understar - Explain t Assessmer - Understar - Plan an E	On successful completion of this course, students should be able to: • Understand the operation of the EIA systems in Hong Kong and other developed countries. • Explain the legal requirements for EIA and EcolA in Hong Kong, as laid out in the Environmental Impact Assessment Ordinance and the Technical Memorandum. • Understand the methodologies of EcolA. • Plan an EcolA study. • Write an EcolA report for a small project.					
Pre-requisites	Pass in BIC	DL0605 or BIOL0600 or ENVS1002					
Offer in 2012 - 2013	2nd sem		Examination	Мау			
Offer in 2013 - 2014	Y	γ					
Teaching Hours	24 hours le	ectures, 10 hours tutorials, 15 hours field trip, 5 hours group work/	project and 70 hours	reading/self study			
Assessment Method	One 2-hou	r written examination (50% weighting) and assessment of course	vork (50% weighting)				
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	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, integration of materials and ability to apply knowledge to familiar and some unfamiliar situations. Demonstrate effective presentational skills. Evidence of clear attention to thoughtful and reflective thinking.					
	C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective presentational skills. Little evidence of clear attention to thoughtful and reflective thinking.						
	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	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.					
Textbooks	2005) HKSAR G	R. Therivel & A. Chadwick: Introduction to Environmental Imp overnment: Technical Memorandum for Environmental Impact overnment, 1998)		Ū.			
References	To be prov	ided in classes					
Course Website	http://www.	.biosch.hku.hk/ecology/lsc/biol3622/					
Remarks	The course	e will be offered subject to a minimum enrollment number.					

BIOL3626 Conserva	tion in prac	tice (6 credits)		Academic Year	2012		
Offering Department	Biological S	ciences	C	Quota	30		
Course Co-ordinator	Professor Y	Sadovy, Biological Sciences					
Course Aim	and concept examples v	To build on the foundation acquired by students in the course "Conservation Ecology" by applying the principles and concepts learned to specific case studies and issues in conservation science. Both local and international examples will be used and assignments will address the social, economic, and political dimensions of achieving successful conservation outcomes, in addition to biological considerations.					
Course Contents	This 6-credit course will address the realities and application of conservation science in the modern world within the wider context of economic development, political considerations, scientific uncertainties, climate change, risk management and diverse cultural issues. It will address the practice relating to the conservation of threatened organisms and their habitats. Special topics to be covered will include the demography of small and fragmented populations, global and local conservation problems, assessment of conservation risk, international conservation and biodiversity instruments (such as CITES - the Convention on International Trade in Endangered Species, and CBD - Convention on Biological Diversity), impacts of conservation projects on indigenous peoples, and actual case histories of conservation of endangered animals and plants, both successful and failed. The course will also examine the historical and current trends relating to species endangerment and extinction and the value of diversity to Society. The interdisciplinary nature of conservation in practice is recognized along with the role of wider Society, beyond academic institutions, such as non-governmental organisations (NGOs).						
Learning Outcomes	On successful completion of the course, students should be able to: - understand the complexities of conserving biodiversity in the modern world - understand the importance of conserving biodiversity from both moral and practical perspectives - be aware of the majore initiatives and measures globally addressing biodiversity issues - know of major conservation issues in Hong Kong and the SE Asian region - be aware of major factors leading to success or failure in maintaining global biodiversity						
Pre-requisites	BIOL2612 (	Conservation ecology					
Offer in 2012 - 2013	Not offered		I	Examination	To be confirmed		
Offer in 2013 - 2014	Y		I				
Teaching Hours	20 hours of	lectures plus project work					
Assessment Method	One 2-hr w	One 2-hr written exam (60% weighting) & continuous assessment (40% weighting)					
	A+ to F						
Course Grade	A+ to F		nenii (40 % weighti				
	A+ to F		nent (40 % weight				
	A						
Course Grade Grade Descriptors	A B						
	A B C						
	A B C D Fail	biosch.hku.hk/ecology/lsc/biol3626/					

BIOL3988 Biologica	l sciences internship (6 credits)	Academic Year	2012					
Offering Department	Biological Sciences Quota							
Course Co-ordinator	Dr T Vengatesen, Biological Sciences							
Course Aim	This course aims to offer students the opportunities to gain work experience in the field of biological sciences that are related to the major(s) of study.							
Course Contents	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(s) that the students are taking and prior approval by the course coordinator is required.							
Learning Outcomes	On successful completion of this course, students should be able to: - Gain first hand work experience in a job placement related to their biological sciences major(s). - Apply the knowledge in their biological sciences major(s) in solving practical problems in the work place. - Acquire an understanding and appreciation of the real work environment. - Extend their network in their field of study.							
Pre-requisites	Students are expected to have satisfactorily completed their Yea	ar 2 study.						
Offer in 2012 - 2013	1st sem 2nd sem Summer	Examination	No Exam					
Offer in 2013 - 2014	Y							
Teaching Hours	No formal teaching. It is expected that students are to work at le working days.	No formal teaching. It is expected that students are to work at least 160 hours (lunch hour excluded) in at least 20 working days.						
Assessment Method	Students taking this course have to submit a two-page writ internships, which will be assessed by internal supervisors. Stu- the internship will also submit an assessment report to the Univer-	dent's supervisor at work i.e. the						
Course Grade	Pass/Fail							
Grade Descriptors								

	Pass	Evidence of the application of professional knowledge to solve problems in the workplace. Evidence of successfulcompletion of tasks required in the job or assigned by supervisor(s). Evidence of effective collaboration and communication with supervisor (s), colleagues, and clients in the job. Satisfactory evaluation results from internal and external (if applicable) supervisor(s). Successfully fulfills all requirements set out in the Course Description regarding working hours, written and oral report, and evaluation by supervisor(s), etc.
	Fail	Very limited or no evidence of the application of professional knowledge to solve problems in the workplace. Very limited or no evidence of successful completion of tasks required in the job or assigned by supervisor(s). Very limited or no evidence of effective collaboration and communication with supervisor(s), colleagues, and clients in the job. Unsatisfactory evaluation results from internal and external (if applicable) supervisor(s), call to fulfill any requirements set out in the Course Description regarding working hours, written and oral report, and evaluation by supervisor(s), etc.
Course Website	http://www	.biosch.hku.hk/ecology/lsc/biol3988/
Remarks	who have Satisfacto internship Students Visit http:/ Enrolment	are expected to have satisfactorily completed their Year 2 study. Special consideration be given to those completed Year 1. ry completion of this course can be counted towards the Experiential Learning requirement. Details of will be recorded on the student's transcript. This course will be assessed on Pass or Fail basis. who are interested to enrol in this course should contact the Department to obtain the approval. //www.hku.hk/science/current/bsc/internship/ for more information.

ENVS1002 Environm	nental life	scienc	ce (6 credits)				Academic Year	2012
Offering Department	Biological	l Science	es			(	Quota	40
Course Co-ordinator	Dr T Veng	gatesen,	, Biological Scier	nces				
Course Aim	and impor biological/ evaluation	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	fundament life at varie urbanizatio students w that huma students w adaptation	This course is a combination of lectures, group discussion/debate and field trips cum tutorials. We first explore the undamental interactions between organisms and their environment. We then explore environmental constraints on ife at various ecosystems (like marine, freshwater, and terrestrial). Students will also learn how factors such as urbanization, climate change, and anthropogenic impacts affect life at population and ecosystem levels. Similarly, students will be exposed to the incredible interrelationships that are basic to ecological principles and the impact hat human development has upon these interrelationships. After learning basics of environmental life science, students will be stimulated to think about current life science issues such as biodiversity loss, organisms adaptation to climate change, tragedy of commons (human ecology) and applied life science topics such as piomaterial science.						
Learning Outcomes	<ul> <li>Understa</li> <li>Apprecia</li> <li>Attain: Al</li> <li>Be motivilia</li> </ul>	On successful completion of this course, students should be able to: Understand: Life, Environment and their interactions Appreciate: Species and ecosystem responses to human-induced environmental change Attain: Ability to critically think and discuss about current environ-life science issues Be motivated and equipped: to tackle biological environmental science questions and to choose advanced environmental science courses.						
Pre-requisites	Nil							
Offer in 2012 - 2013	1st sem					E	Examination	Dec
Offer in 2013 - 2014	Y							
Teaching Hours	24 lectures	es; 8 hou	urs tutorial; 3 hou	urs group work/p	roject and 3 to 12 ho	ours field w	ork	
Assessment Method			en examination ( itation (10% weig		continuous assess	sment (10%	6 weighting), test	(10% weighting)
Course Grade	A+ to F							
Grade Descriptors	A Evidence of original thought during the analysis of environmental life science issues. Show evidence of analytical, critical and multidimensional thinking about the study subject. Extensive knowledge and skills required for attaining all the course learning outcomes. Demonstrate excellent ability to apply what you have learned in the class room to critically analyze the real environmental life science issues. Show highly effective organizational, presentational and field trip skills.							
	B Show substantial knowledge and thought during the analysis of environmental life science issues. Show some evidence of some analytical, critical and multidimensional thinking about the study subject. Good knowledge and skills required for attaining all the course learning outcomes. Demonstrate good ability to apply what you have learned in the class room to critically analyze the real environmental life science issues. Show effective organizational, presentational and field trip skills.							
	С	C Show general but incomplete knowledge and original thought during the analysis of environmental life science issues. Fair knowledge and skills required for attaining all the course learning outcomes. Demonstrate fair ability to apply what you have learned in the class room to critically analyze the real environmental life science issues. Show considerable organizational, presentational and field trip skills.						
	D	Evidence to show a minimum knowledge (i.e. knowledge is very incomplete) and thought during the analysis of environmental				comes. Demonstrate		
	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.							
References	TBC							
Course Website	http://www	w.biosch	.hku.hk/ecology/	/lsc/envs1002/				

		ic principles in ecology and evolution (6 credits) Academic Year 2012						
Offering Department	Biological	Sciences	Quota	60				
Course Co-ordinator	Dr D L Tho	omson, Biological Sciences						
Course Aim	population emphasize introductor	Demography determines the interplay between wildlife populations and environments. This course explains how populations increase, decrease, stabilize, destabilize or die out. It explains how life histories themselves adapt, and emphasizes the common demographic principles in both population dynamics and evolutionary change. This introductory course is part of the major in Environmental Science, but will be of value and interest to science and non-science students generally, complementing courses in Ecology & Biodiversity particularly well.						
Course Contents	discussion demograph bringing th unstable a the spread this in turn population	This course is taught principally as lectures, supported by problem-based learning with exercises, essays, discussions and presentations. The course is an introductory course which starts with an emphasis on the simpler demographic models characteristic of constant conditions. We explore the processes of mortality and reproduction, bringing these together to see how populations grow and shrink. We look at what makes populations stable or unstable and what makes them vulnerable to extinction. We show how the very same principles which determine the spread of populations through environments also determine the spread of genes through populations and how this in turn shapes the evolution of demography itself. We show how the relationship between environments and populations should be thought of not just in terms of causes and effects but in terms of conditions and dynamic responses.						
Learning Outcomes	<ul> <li>Explain the second secon</li></ul>	On successful completion of this course, students should be able to: - Explain the demographic principles of how birth and death translate into population change - Outline the demographic processes which shape the evolution of life-history decisions - Apply demographic thinking to problems in wildlife population management						
Pre-requisites		Pass in ENVS0001 or BIOL0126 or ENVS1002 or BIOL0625 or BIOL0604 or STAT1301 or MATH1111 or BIOL0605 or ECON1001						
Offer in 2012 - 2013	1st sem		Examination	Dec				
Offer in 2013 - 2014	Y							
Teaching Hours		hours in total, including 12 hours of lectures, and 24 hours of ons and group discussion	problem-based learning	g with exercises				
Assessment Method	One 2-hou	r final class test (60% weighting), ongoing exercises (20%), ess	ays (20%)					
Course Grade	A+ to F							
Grade Descriptors	A	A Evidence not only of a thorough and accurate grasp of the material as explained in the course, but of the ability to interpret, synthesise, evaluate, analyse, explain and illustrate this material, both critically and originally, applying it effectively to novel situations in order to solve even abstract and unfamiliar problems.						
	B Evidence of an extensive and predominantly accurate grasp of the material as explained in the course. Evidence of the ability to analyse, explain and illustrate this material effectively, though not necessarily in highly original ways. Demonstrated ability to solve problems effectively using the principles explained in the course.							
	C Demonstrated grasp of the main principles as covered in the course, and the ability to explain and illustrate these through recall of the argumentation and illustrations provided. Evidence of some ability to solve problems adequately through application of the principles covered in the course.							
	D	D Evidence of basic recall of some key ideas, and of the logic behind these. Some evidence of rudimentary problem-solving abilities using ideas developed in the course.						
	Fail Evidence of only limited recall of some basic course material. Evidence of only limited ability to tackle proprinciples covered in the course.							
	- an	principles covered in the course.	Rockwood 2006. Introduction to Population Ecology. Wiley-Blackwell. ISBN 978-1-405-3263-3					
Textbooks	Rockwood	2006. Introduction to Population Ecology. Wiley-Blackwell.						
Textbooks References	Rockwood ISBN 978- ISBN-13-9 Preston, H Population ISBN 1-55	2006. Introduction to Population Ecology. Wiley-Blackwell.						

ENVS2009 Remediation (6 credits) Academic Year 2012						
Offering Department	Biological Sciences Quota 50					
Course Co-ordinator	Dr J D Gu, Biological Sciences					
Course Aim	To introduce students with the environmental fate information of different pollutants/contaminants in the environment To understand the technologies available for environmental remediation of pollutants in soils and water, and the characteristics of each techniques relevant to the pollutants of concern To learn the fundamental physical, chemical and biochemical reactions involved in the remediation process To obtain skills for critical analysis of the recent technological development and the proposed applications					
Course Contents	Understanding the types of different pollutants and their fate in the environments including both terrestrial and aquatic; and relevant strategy of pollution control and treatment; advanced oxidation, microbiological treatment and phytoremediation; mechanisms of biochemical transformation of polyaromatic hydrocarbon, polychlorinated biphenols, agrichemicals and phthalate esters as well as both metals and metalloids; biochemical pathways and the specific genes involved in detoxification; chemotaxis and engineering the degradation pathways in bacteria; transport of microorganisms and monitoring in subsurface environment; survival of introduced organisms; evolution of the degradative genes in bacteria; in situ and ex situ remediation techniques; green technologies.					
Learning Outcomes	On successful completion of this course, students should be able to: - Explain the remediation technologies available to the type of pollutants of co	oncern in remediatio	n practice			

	<ul> <li>Propose remediation strategies for polluted sites with the best technologies available considering the type of pollutants and the cost involved</li> <li>Differentiate the technologies available for the specific pollutants and the fundamental process involved in terms of the catalysts and the effectiveness</li> <li>Describe several key chemical and biochemical processes used in environmental remediation with adequate background information on their history and development</li> </ul>					
Pre-requisites		Pass in ENVS0001; and Pass in BIOL2606 or ENVS2008, or already enrolled in either course.				
Offer in 2012 - 2013	Not offered	Not offered Examination To be confirm				
Offer in 2013 - 2014	Y					
Teaching Hours	24 lectures	36 hours of laboratory and	d/or case review			
Assessment Method		One 2-hour written examination (50% weighting) and student-based assessment (50% weighting). Student-based assessment includes laboratory report, review report, group project, presentations or other forms.				
Course Grade	A+ to F	A+ to F				
Grade Descriptors	A	outcomes. Thorough grasp of the evidence of original thought.	nced level of extensive knowledge and sk e subject matter. Show very strong analytics Apply highly effective lab skills and techn usions. Apply highly effective organizational a	I and critical abilities and h iques. Critical use of data	igh logical thinking, with	
	В	outcomes. Substantial grasp o	ad range of knowledge and skills required f the subject. Show evidence of analytical iques. Correct use of data of results to al skills.	and critical abilities and	logical thinking. Apply	
	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	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	or no grasp of the knowledge logical and coherent thinking.	d of knowledge and skills required for attaini and understanding of the subject. Evidence /linimally effective or ineffective lab skills a clusions. Organization and presentational ski	of little or lack of analytic nd techniques. Misuse of c	al and critical abilities, data and results and/or	
Textbooks			licrobiology (ASM Press, 2nd editio hytoremediation: Transformation ar		nants (Wiley)	
References	R. Mitchell	J-D Gu: Environmental M	licrobiology (Wiley-Blackwell, 2nd e	dition)		
Course Website	http://www	oiosch.hku.hk/ecology/lsc/e	envs2009/			

ENVS2012 Global cl	nange ecology (6 credits)	Academic Year	2012					
Offering Department	Biological Sciences	Quota	50					
Course Co-ordinator	Dr C Dingle, Biological Sciences							
Course Aim	To introduce students to the ways in which environmental change affects biodiversity from organisms to ecosystems. This course will explore the contributions that human population growth and globalization have made to increases in greenhouse gases and associated climate change, biological invasions, land degradation, disease, and, ultimately, impacts on biological systems.							
Course Contents	Environmental change is a natural phenomenon, with ecosystems continually shifting, rearranging, emerging, and disappearing through geologic time with changes in climatic conditions. The activities of humans have added to this natural variation, increasing the magnitude and speed with which environmental change occurs. This course will focus principally on the effects of climate change on organisms and ecosystems but will also investigate other topics registering on a global scale including land use change, biological invasions, and eutrophication. We will explore (1) what climate change is and how it is manifested including climate warming, sea level rise, and ocean acidification; (2) types and extents of land use change; (3) how globalization has contributed to the spread of alien species and disease; and (4) increases in eutrophication of aquatic ecosystems with a focus on marine "dead zones". The course will investigate how these human-caused stressors affect the morphology, phenology, distributions, and evolution of organisms and their impacts on ecosystem functioning and biodiversity in freshwater, marine, and terrestrial ecosystems.							
Learning Outcomes	On successful completion of the course, students should be able to : - develop a basic understanding of what climate change and other human-associated impacts, such as land use change, are and how they are manifested on a global scale. - explain the ways that global change affects organisms' traits and distributions, and biodiversity at the ecosystem level. - understand the differences between climate change on a geologic time scale and recent climate change. - be aware of the relationships between humans and global change.							
Pre-requisites	Pass in ENVS1002							
Offer in 2012 - 2013	2nd sem	Examination	May					
Offer in 2013 - 2014	Y							
Teaching Hours	24 hours of lectures, 12 hours of tutorials, and 20 hours problem-based learning	ng						
Assessment Method	One 2-hour written examination (50% weighting); problem-based exercises assessment (25% weighting)	cises (25% weightir	ng); continuous					

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	Demonstrate general but incomplete command of knowledge and skills required for 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.	
Textbooks	Lovejoy, T USA.	E. and Hannah, L. 2005. Climate Change and Biodiversity. Yale University Press, New Haven, CT,	
References	Araujo, M.B., and Rahbek, C. 2006. How does climate change affect biodiversity? Science 313:1396-1397. Grimm, N.B., Faeth, S.H., Golubiewski, N.E., Redman, C.L., Wu J., Bai, X., and Briggs, J.M. 2008. Global change and the ecology of cities. Science 319:756-760. Schlesinger, W.H. 2006. Global change ecology. Trends in Ecology and Evolution 21:348-351.		
Course Website	http://www	.biosch.hku.hk/ecology/lsc/envs2012/	

ENVS3013 Ecologic	aracmogr	grapity	, in onangi	ig entrioni		/		-
Offering Department	Biological	Biological Sciences					Quota	60
Course Co-ordinator	Dr D L Thomson, Biological Sciences							
Course Aim	how wildli in populat This adva	By using integrated population models, biodemographers can diagnose environmental problems and understand how wildlife populations respond and adapt under changing conditions. This course will look not just at fluctuations in population size, but at how rates of mortality and fertility change and adapt giving rise to dynamic processes. This advanced course is part of the Environmental Science major, but will be of value to a wide range of students fitting particularly well with courses in Ecology & Biodiversity.						
Course Contents	discussion the life-cy the popul introduces understan conditions	This course is taught principally as lectures, supported by problem-based learning with exercises, essays, discussions and presentations. We explore what happens to mortality rates and fertility rates in different parts of the life-cycle and in different sections of the population when conditions change while uncovering what happens as the population responds initially and as the life-history itself adapts to the environmental change. This course introduces modern methods of demographic analysis and shows how to diagnose environmental problems from an understanding of dynamic biodemographic processes. We explore not just trends or changes in environmental effects on population dynamics and on the evolution of life-histories.						
Learning Outcomes	<ul> <li>Explain demograp</li> <li>Outline t</li> <li>Tackle e</li> </ul>	On successful completion of this course, students should be able to: - Explain how dynamic population and evolutionary processes arise from both environmental change and the demographic properties of wildlife populations - Outline the demographic principles of how wildlife populations will respond and adapt to environmental change - Tackle environmental issues using demographic approaches, explaining the principles of how to diagnose and solve problems						
Pre-requisites		Pass in BIOL1608, BIOL2608 or BIOL2610 or BIOL2611 or BIOL2612 or BIOL2615 or BIOL2617 or BIOL2619 o ENVS2003 or STAT2301 or STAT2801 or ECON2101						
Offer in 2012 - 2013	Not offere	red					Examination	To be confirme
Offer in 2013 - 2014	Y							
Teaching Hours			s in total, incluind group disc		rs of lectures,	and 24 hours	of problem-based learr	ing with exercise
Assessment Method	One 2-ho	our writ	tten examinati	on (60% weig	hting), ongoir	ng exercises (20	%) and essays (20%)	
Course Grade	A+ to F							
Grade Descriptors	A Evidence not only of a thorough and accurate grasp of the material as explained in the course, but of the ability to interpret, synthesise, evaluate, analyse, explain and illustrate this material, both critically and originally, applying it effectively to novel situations in order to solve even abstract and unfamiliar problems.							
	B Evidence of an extensive and predominantly accurate grasp of the material as explained in the course. Evidence of the ability to analyse, explain and illustrate this material effectively, though not necessarily in highly original ways. Demonstrated ability to solve problems effectively using the principles explained in the course.							
	с	C Demonstrated grasp of the main principles as covered in the course, and the ability to explain and illustrate these through recall of the argumentation and illustrations provided. Evidence of some ability to solve problems adequately through application of the principles covered in the course.						
	D Evidence of basic recall of some key ideas, and of the logic behind these. Some evidence of rudimentary problem-solving abilities using ideas developed in the course.							
	Fail Evidence of only limited recall of some basic course material. Evidence of only limited ability to tackle problems using the principles covered in the course.							
Textbooks	Rockwood 2006 Introduction to Population Ecology. Wiley-Blackwell. ISBN 978-1-4051-3263-3 Roff 2002 Life History Evolution. Sinauer Associates. ISBN-10:0878937560 or ISBN-13:978-0878937561							

References	Lande, Engen & Saether Stochastic Population Dynamics in Ecology and Conservation. Oxford University Press
Course Website	http://www.biosch.hku/ecology/lsc/envs3013
Remarks	Candidates are encouraged to be enrolled in or to have passed ENVS2003.

	nentai riska	assessment and management (6 credits)	Academic Year	2012				
Offering Department	Biological S	Sciences	Quota					
Course Co-ordinator	Dr K M Y L	Dr K M Y Leung, Biological Sciences						
Course Aim	associated determining human hea developed	This course will introduce how we can assess & manage environmental risks (ER) with an emphasis on those that associated with anthropogenic activities. Environmental risk assessments (ERAs) are useful scientific tools for determining the likelihood that human activities such as contaminant releases, pose an unacceptable risk to human health or the environment of concern. Currently, ERAs are required under various regulations in many developed countries to enable objective assessment & characterization of the ER, support decision-making and risk management & promote effective communications.						
Course Contents	studies. St manageme basic risk a benefit ana	his course will address the theory and practice of human and ecological risk assessments with real case tudies. Students completing the course will gain a sound knowledge of the concepts and principles of ERAs, risk anagement and risk communication as applied in practice. Students can expect to become familiar with the asic risk assessment tools such as the prospective, retrospective and tiered ERA approaches, as well as the risk-enefit analysis. Students will be able to select and apply these tools to tackle risk issues; and appreciate the trepretation of environmental risks and the role of ERAs in environmental policy formulation and decision making.						
Learning Outcomes	- Describe environmer - Character and Monte - Identify th	n successful completion of this course, students should be able to: Describe the basic principles, concepts and practices of ivironmental risk assessment (ERA); Characterize environmental risk using the hazard quotient approach id Monte Carlo simulation; dentify the major uncertainties in ERA processes; and Communicate environmental risk effectively at various levels.						
Pre-requisites	Pass in BIC	DL1608 or BIOL2608 or BIOL2614 or CHEM2102 or ENVS2008 o	r ENVS2009					
Offer in 2012 - 2013	Not offered		Examination	To be confirmed				
Offer in 2013 - 2014	Y							
Teaching Hours	Up to 55 ho	ours of lectures, tutorials, exercises, presentations and group disc	ussion					
Assessment Method	One 2-hour	written examination (60% weighting), ongoing exercises (30%) a	nd essays (10%)					
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 stron analytical and critical abilities and logical thinking, with evidence of original thought. Apply highly effective skills and technique for conducting environmental risk assessments. Be able to critically use information, data and results to draw appropriate ar insightful conclusions. Apply highly effective organizational and presentational skills.						
	В	B Demonstrate substantial grasp of the subject and skills required for attaining at least most of the course learning outcomes. Present evidence of analytical and critical abilities and logical thinking. Apply effective skills and techniques for conducting environmental risk assessments. Be able to correctly use information, data and results to draw appropriate conclusions. Apply effective organizational and presentational skills.						
	С	C Demonstrate general but incomplete grasp of the subject and skills required for attaining some of the course learning outcomes. Present evidence of some analytical and critical abilities and logical thinking. Apply moderately effective skills and techniques for conducting environmental risk assessments. Demonstrate mostly correct but some erroneous use of information, data and results to draw appropriate conclusions. Apply moderately effective organizational and presentational skills.						
	D	Demonstrate partial and limited grasp of the subject and skills required for attaining some of the course learning outcomes. Present evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Apply limited or barely effective skills and techniques required for basic environmental risk assessments. Demonstrate limited ability to use information, 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 subject and skills required for attaining any of the course learning outcomes. Present evidence of little or lack of analytical and critical abilities, logical and coherent thinking. Apply minimally effective or ineffective skills and techniques required for basic environmental risk assessments. Demonstrate misuse of information, data and results and/or unable to draw appropriate conclusions. Apply minimally effective or ineffective or grazitational skills							
Textbooks	TBC							
References	To be confi	rmed						
Course Website	http://www.	biosch.hku.hk/ecology/lsc/envs3014/						
Remarks		m 2011-2012. n BIOL3622 & ENVS3014 is preferred.						

ENVS3016 Environm	Academic Year	2012				
Offering Department	Biological Sciences	Quota	18			
Course Co-ordinator	Dr M Yasuhara, Biological Sciences					
Course Aim	To provide students experiential learning experience in the field of environmental science. The course is primarily based on an array of relevant field studies covering four essential areas as shown below. Invited guest lectures delivered by environmental practitioners may be held.					
Course Contents	Students to attend a series of field trips in, or outside, Hong Kong through trips may include:	out the final academ	nic year. The field			

	(2) Enviro Power, th Council, a (3) Natura Fish Mark RAMSAR Marine Pa (4) Urban selected s	<ol> <li>Environmental science and technologies: visiting water treatment plant, waste water treatment plant, strateg landfill sites, power plants, Environmental Management Division of Productivity Council (for research and development of green technology), Centre for Marine Environmental Research and Innovative Technology;</li> <li>Environmental management: visiting Environmental Protection Department, selected green groups (e.g. Gree Power, the Nature Conservancy, Friends of the Earth, WWF-HK and Green Council), Business Environment Council, and selected waste management companies;</li> <li>Natural resource management and conservation: visiting Agriculture, Fisheries and Conservation Departmer Fish Marketing Organization, local fisheries organizations, agriculture/aquaculture/mariculture farms, Mai P RAMSAR Site, Hong Kong Wetland Park, Hong Kong Organic Resource Centre, Country Park Visitor Centre, ar Marine Parks and Reserves;</li> <li>Urban planning and sustainable development: visiting Kadoorie Institute in Shek Kong, Planning Departmer selected sites for field studies on land use problems, natural hazards, and solutions, and selected commerciefirms for carbon auditing and insurance solutions.</li> </ol>					
Learning Outcomes	<ul> <li>recogniz</li> <li>gain kno</li> </ul>	On successful completion of this course, students should be able to: • recognize ways of environmental science in practice, • gain knowledge of current environmental problems and solutions, and • present and communicate their field observations and findings.					
Pre-requisites	Satisfacto	rily completed second year of study in the Environmental Science i	major				
Offer in 2012 - 2013	Year long		Examination	No Exam			
Offer in 2013 - 2014	Y						
Teaching Hours		Students will take part in at least 48 hours of field trips and 18 hours of guided discussions. Some trips will be organized in the summer vacation and reading weeks, and others in weekends.					
Assessment Method	Field repo	rts (30% weighting), group presentation (30% weighting) and indivi	idual report (40% v	/eighting)			
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.						
	В	B Demonstrate substantial grasp of the subject. Evidence of analytical and critical abilities and logical thinking. Apply effective lab / fieldwork skills and techniques. Correct use of data of results to draw appropriate conclusions. Apply effective organizational and presentational skills.					
	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.						
	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 Website	http://www	v.biosch.hku.hk/ecology/lsc/envs3016/					
Remarks		om 2011-2012. rily completed second year of study in the Environmental Science	major.				

ENVS3988 Environr	nental science internship (6 credits)	Academic Year	2012				
Offering Department	Biological Sciences	Quota	30				
Course Co-ordinator	Dr C Dingle, Biological Sciences						
Course Aim	To offer students the opportunities to gain work experience in applying knowledge and skills gained in the study of the major to the real work environment.						
Course Contents	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.						
Learning Outcomes	On successful completion of this course, students should be able to: - gain at least 4 weeks of work experience environmental-related firm or the Government - acquire an understanding and appreciation of the real work environment - have some experience with applying learned knowledge to solving real world problems						
Pre-requisites	Students are expected to have satisfactorily completed their Year 2 st	udy.					
Offer in 2012 - 2013	1st sem 2nd sem Summer	Examination	No Exam				
Offer in 2013 - 2014	Υ						
Teaching Hours	No formal lecture is to be given, but it is expected that students an excluded) in at least 20 working days, supervised by a staff member.	e to work for at least 160	hours (lunch hour				
Assessment Method	Upon completion of the internship, each student is required to submit a written report and to give a presentation on their internship experience. Supervisors are required to assess the students based on their performance during the internship period (in the case of internships outside the university, the Internal Supervisor will assess the student based on the feedback by the External Supervisor).						
Course Grade	Pass/Fail						
Grade Descriptors	Demonstrate ability of applying knowledge tosolve problems in the w	Demonstrate ability of applying knowledge tosolve problems in the workplace. Successfully handle and carry out the work					

	Pass	Pass required in the job or assigned by supervisor(s). Establish effective collaboration and communication with supervisor colleagues, and clients in the job.Successfully fulfill the requirements set out in the Course Description regarding wo hours, written and oral report, and evaluation by supervisor(s).				
	Fail	Demonstrate very limited or no ability of applying knowledge tosolve problems in the workplace. Fail to handle or carry ou work required in the job or assigned by supervisor(s). Fail to establish effective collaboration or communication with supe (s), other colleagues, or clients in the job.Fail to satisfy the requirements set out in the Course Description regarding wo hours, written and oral report, or evaluation by supervisor(s).				
Course Website	http://www.	http://www.biosch.hku.hk/ecology/lsc/envs3988/				
Remarks	Students are expected to have satisfactorily completed their Year 2 study. In exceptional circumstar consideration may be given to those who have completed Year 1. Satisfactory completion of this course can be counted towards the Experiential Learning requirement internship will be recorded on the student's transcript. This course will be assessed on Pass or Students who are interested to enrol in this course should contact the Department to obtain the approva Visit http://www.hku.hk/science/current/bsc/internship/ for more information. Enrolment of this course is not conducted via the online course selection system and should be made relevant Department/School office after approval has been obtained from the course coordinator.					

CAES1801 Academi	c English	n for Scie	ence Students (	3 credits)		Academic Year	2012
Offering Department	English					Quota	
Course Co-ordinator	Mr P D D	Mr P D Desloge, English					
Course Aim	To build o	confidence	e in the use of Eng	lish for writing and spe	aking about scienc	æ.	
Course Contents				which meets the requi and avoiding plagiaris			
Learning Outcomes	<ul> <li>Write an</li> <li>Underst</li> </ul>	On successful completion of this course, students should be able to: - Write an essay which adheres to the conventions of academic writing and demonstrates effective use of English. - Understand and apply the conventions of referencing in relation to the use of sources. - Make an academic presentation while speaking in an organised and coherent way.					
Pre-requisites	Not for st	tudents wh	no have passed in	ECEN1801 before.			
Offer in 2012 - 2013	1st sem					Examination	Dec
Offer in 2013 - 2014	Y						
Teaching Hours	One 2-ho	ours class	per week for 12 we	eeks			
Assessment Method	One exar	mination (3	30%) and continuo	us assessment (70%)			
Course Grade	A+ to F						
Grade Descriptors	A	A Excellent result. Wholly appropriate productive skills displaying a complete awareness of audience, purpose and structure in disciplinary work. Students demonstrate an ability to fully comprehend and critically interpret spoken and written texts. Students are able to successfully evaluate their language performance in all areas. Written language contains very few, if any systematic errors in grammar and vocabulary. Spoken language is always comprehensible and fluent. Good to very good result. Mostly appropriate productive skills displaying good awareness of audience, purpose and structure although there are occasional lapses in areas such as tone. Students can comprehend and interpret texts with ease, although					
	B	B they may miss sophisticated inferences. Students are able to successfully evaluate their language performance in most area Written language is mostly accurate but contains a few systematic errors in complex grammar and vocabulary. Spok language is mostly comprehensible and fluent. Satisfactory to reasonably good result. Productive skills are often inappropriate for a disciplinary audience, although there is overall sense that the work is communicating to an academic audience. Purposes may be unclear and tone is often unsuitab					vocabulary. Spoken , although there is an e is often unsuitable.
	С	and writ areas.	Students have some difficulty comprehending and critically interpreting texts, sometimes failing to underst and writers' views and attitudes. Students are able to successfully evaluate their language performance in areas. Written language is often inaccurate, although errors when they occur are more often in com vocabulary. Spoken language is generally comprehensible and fluent but at times places strain on the listen			n a limited number of nplex grammar and	
	D	Barely satisfactory result. Productive skills are mostly inappropriate for a disciplinary audience. The purposes are not made explicit and the tone is often problematic. Students have real difficulty comprehending and interpreting texts, of to understand the main ideas and writers' views and attitudes. Students are rarely able to evaluate their performance. Written language is often inaccurate containing frequent errors in simple and complex grammar and void Spoken language is sometimes comprehensible and fluent, but strain is frequently placed on the listener.				ng texts, often failing ate their language	
	Fail Unsatisfactory result. Productive skills are too limited to be able to successfully carry out tasks. Students are unable to follo and interpret texts. There are language errors in almost every sentence. Assessments may not have been attempted contain plagiarism.						
Textbooks	NIL						
References	NIL						
Course Website	Caes.hku	Caes.hku.hk/science/year1					
Remarks		e of this c	pulsory for all B.So ourse has been c	c. students. hanged to CAES1801	from ECEN1801	with effect from th	e academic yea

CAES2602 Auvance	u ⊏ngiisn	i for Scien	ce Students (3 credits)		Academic Year	2012		
Offering Department	English	English Quota						
Course Co-ordinator	Mr P D D	Mr P D Desloge, English						
Course Aim		lop a sense c e learning.	f audience awareness in w	riting, to develop spontaneou	us speaking skills a	nd to individualis		
Course Contents	topic focu workshop	The focus is on: (1) Writing a short article for one of a range of web journals each with a different audience and topic focus (individual choice); (2) Spontaneous (i.e. unrehearsed) discussion through participation in speaking workshops and one-to-one discussions; (3) Developing independent language learning skills to help students address their individual language problems and focus on their future language needs.						
Learning Outcomes	- Discuss clarity, co - Identify - Identify	On successful completion of this course, students should be able to: - Discuss science and non-science topics spontaneously while demonstrating accuracy of grammar, pronunciation, clarity, comprehensibility and relevance to topic. - Identify their own language learning needs and develop a plan to meet those needs. - Identify and make use of the key characteristics of writing for a specific target audience, e.g. age, cultural background, geographical location and subject knowledge.						
Pre-requisites	Pass in E	ECEN1801/C	AES1801					
Offer in 2012 - 2013	2nd sem	ı			Examination	May		
Offer in 2013 - 2014	Y							
Teaching Hours	One 2-ho	One 2-hours class per week for 12 weeks						
Assessment Method	One exar	mination (309	6) and continuous assessm	nent (70%)				
Course Grade	A+ to F							
Grade Descriptors	A Excellent result. Wholly appropriate productive skills displaying a complete awareness of audience, purpose and structure in disciplinary work. Students demonstrate an ability to fully comprehend and critically interpret spoken and written texts. Students are able to successfully evaluate their language performance in all areas. 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. Mostly appropriate productive skills displaying good awareness of audience, purpose and structure, although there are occasional lapses in areas such as tone. Students can comprehend and interpret texts with ease, although they may miss sophisticated inferences. Students are able to successfully evaluate their language performance in most areas. 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. Productive skills are often inappropriate for a disciplinary audience, although there is a overall sense that the work is communicating to an academic audience. Purposes may be unclear and tone is often unsuitable Students have some difficulty comprehending and critically interpreting texts, sometimes failing to understand the main idea and writers' views and attitudes. Students are able to successfully evaluate their language performance in a limited number areas. Written language is often inaccurate, although errors when they occur are more often in complex grammar ar vocabulary. Spoken language is generally comprehensible and fluent but at times places strain on the listener.						
	<ul> <li>Barely satisfactory result. Productive skills are mostly inappropriate for a disciplinary audience. The purposes are not clear or made explicit and the tone is often problematic. Students have real difficulty comprehending and interpreting texts, often failin to understand the main ideas and writers' views and attitudes. Students are rarely able to evaluate their language performance. Written language is often inaccurate containing frequent errors in simple and complex grammar and vocabulary. Spoken language is sometimes comprehensible and fluent, but strain is frequently placed on the listener.</li> </ul>							
	Fail		et texts. There are language err	o limited to be able to successfully or in almost every sentence. Ass				
Textbooks	NIL							
References	NIL							
Course Website	Caes.hku	u.hk/science/	/ear2					
Remarks		le of this cou	sory for all B.Sc. students. rse has been changed to	CAES2802 from ECEN2802	with effect from th	e academic ye		

CHEM0003 Chemist	ry and dail	y life (3 credits)	Academic Year	2012			
Offering Department	Chemistry		Quota	200			
Course Co-ordinator	Prof W K C	Prof W K Chan, Chemistry					
Course Aim		e is designed as an elective for students in all d. It gives an overview of some important chemical					
Course Contents	following to household developme	This course will give a brief overview on what chemists have achieved for the improvement of our daily life. The following topics will be included: the production and working principles of various consumer products such as household chemicals, personal health care products, plastics, petroleum etc.; the roles of chemistry in the development of advanced technological products such as computer, CD Roms, and integrated circuit chips; energy for the future.					
Learning Outcomes	- understa	sful completion of this course, students should be al nd the importance of chemistry to the development of kamples of important chemicals and materials for da	f modern technology, and how i				
Pre-requisites	Not for stur Not for stur Not for stur Not for stur Not for stur	Not for students who have passed in CHEM1002, or have already enrolled in this course; and Not for students who have passed in CHEM1003, or have already enrolled in this course; and Not for students who have already passed in CHEM1005 before; and Not for students who have already passed in CHEM1007 before; and Not for students who have passed in CHEM1009, or have already enrolled in this course; and Not for students who have passed in CHEM1009, or have already enrolled in this course; and Not for students who have passed in CHEM1401, or have already enrolled in this course; and Not for Chemistry major students.					
Offer in 2012 - 2013	Not offered	I	Examination	No Exam			
Offer in 2013 - 2014	N						
Teaching Hours	12 hours le	ectures plus up to 3 hours tutorial and demonstration	classes				
Assessment Method	Continuou	s assessment including essays, project and test (100	)%)				
Course Grade	A+ to F						
Grade Descriptors	A	Demonstrate thorough knowledge and understanding of essential facts, concepts, principles and theories relating to the basis foundation knowledge of inorganic and organic chemistry and their relevance to biology and materials science. Show strong ability to apply and integrate knowledge and theory relating to the basic foundation knowledge of inorganic & organic chemistry. Show strong ability to analyze novel problems and critical use of data and experimental results to draw appropriate and insightful conclusions relating to the basic principles and knowledge of inorganic & organic chemistry.					
	в	Demonstrate substantial command of knowledge and understanding of essential facts, concepts, principles and theories relating to the basic foundation knowledge of inorganic and organic chemistry and their relevance to biology and materials science. Show evidence to apply and integrate knowledge and theory relating to the basic foundation knowledge of inorganic and organic 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 inorganic and organic chemistry.					
	с	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 and organic chemistry and their relevance to biology and materials science. Show evidence of some abilities to apply and integrate knowledge and theory, and 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 and organic chemistry.					
	Demonstrate partial but limited command of knowledge and understanding of essential facts, concepts, principles, and theories relating to the basic foundation knowledge of inorganic and organic chemistry and their relevance to biology and materials science. Show evidence of limited abilities to apply and integrate knowledge and theory, and limited ability to analyze problems to most familiar situations and mostly correct but erroneous use of data and experimental results to draw appropriate conclusions relating to the basic principles and knowledge of inorganic and organic chemistry.						
	Fail Demonstrate little or no evidence of command of knowledge and understanding of essential facts, concepts, principles, and theories relating to the basic foundation knowledge of inorganic and organic chemistry and their relevance to biology and materials science. 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 and erroneous use of data and experimental results to draw appropriate conclusions relating to the basic principles and knowledge of inorganic and organic chemistry.						
		conclusions relating to the basic principles and knowledge of in	lorganic and organic chemistry.				

CHEM0008 Fundam	ental chemistry (6 credits)	Academic Year	2012			
Offering Department	Chemistry	Quota				
Course Co-ordinator	Dr A P L Tong, Chemistry					
Course Aim	To provide students, who are interested in chemistry but lack the AL/AS Chemistry background or equivalent, a foundation course in general chemistry. The course aims to lay a good theoretical and practical foundation for students. It will prepare students with the necessary knowledge, study and practical skills to further explore chemistry or to complement their studies in other science disciplines.					
Course Contents	The course will include the following topics: the mole concept and thermodynamics; chemical kinetics; atomic structure; the periodic tab chemical equilibrium; acid-base equilibria; and organic chemistry: a st groups.	le; chemical bonding &	bonding theories;			
Learning Outcomes	<ul> <li>On successful completion of this course, students should be able to:</li> <li>demonstrate knowledge and understanding in relation to some conventions.</li> <li>demonstrate knowledge and understanding in relation to selected fa and concepts in chemistry and their limitations.</li> <li>demonstrate awareness of the relevant applications of chemistry in social identify problems for given situations, and select and apply acquire problems.</li> <li>organize and present chemical ideas in a clear, logical and coherent for observe and record experimental observations accurately, and interpret</li> </ul>	cts, phenomena, laws, ciety and in everyday life d knowledge and unde prms.	principles, theories a. arstanding to solve			
Pre-requisites	E or above in HKCEE Chem; and					

	Not for stu	Not for students with E or above in AL Chem or AS Chem.					
Offer in 2012 - 2013	Not offere	Not offered Examination To b					
Offer in 2013 - 2014	Ν	N '					
Teaching Hours	36 hours o	of lecture	s and tutorials;	3 x 3 hours of laborate	ory sessions		
Assessment Method	One 2-ho work and		n examination (6	60 % weighting) and	continuous assessm	ent (40 % weightir	ng) through practical
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 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 organizational and presentational skills.					
	D	Show p coherer problem	partial but limited gr	ited command of knowledg rasp, with retention of som ng, but with limited analytic artially effective lab skills	ne relevant information, cal and critical abilities.	of the subject. Demons show limited ability to a	trate evidence of some oply knowledge to solve
	Fail	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 minimall effective or ineffective lab skills and techniques. Organization and presentational skills are minimally effective or ineffective.					tical and critical abilities, Demonstrate minimally
Textbooks	Theodore	e E Brown	: Chemistry: Th	e Central Science (Pr	entice Hall, latest ec	lition)	
Remarks				v passed HKUSPACE		Chemistry I or II b	efore. Students with

CHEMITUUZ CHEMIST	ry: princip	les and concepts (6 credits)	Academic Year	2012				
Offering Department	Chemistry		Quota	200				
Course Co-ordinator	Prof D L P	hillips, Chemistry						
Course Aim	To provide courses.	To provide basic knowledge of modern chemistry. This course is a pre-requisite for the advanced chemistry courses.						
Course Contents		Introduction to quantum theory, atomic and molecular structures, chemical bonding. Structures and properties of matters. Gas Laws and kinetic theory. Chemical energy, equilibrium and thermodynamics. Chemical kinetics.						
Learning Outcomes	<ul> <li>Understa</li> <li>Demons structures,</li> <li>Understa</li> <li>Understa</li> </ul>	On successful completion of this course, students should be able to: Understand the terminology and nomenclature associated with general chemistry topics discussed in the course Demonstrate knowledge and understanding of basic concepts in quantum theory, atomic and molecular structures, chemical bonding, thermodynamics and chemical kinetics Understand the relationships between atomic and molecular structures to chemical bonding Understand the relationships between the laws of thermodynamics and transformations of energy in chemistry and the physical forms of matter						
Pre-requisites	Not for stu	E or above in AL or AS Chem; or Pass in CHEM0008); and ot for students who have already passed in CHEM1007 before; and ot for students who have passed in CHEM1009, or have already enrolled in this course.						
Offer in 2012 - 2013	1st sem		Examination	Dec				
Offer in 2013 - 2014	N							
Teaching Hours	36 hours o	f lectures and tutorials						
Assessment Method	One 2-hou	r written examination (75% weighting) and continuous assessr	nent (25% weighting)					
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. Apply highly effective organizational and presentational skills.							
	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show substantial grasp of the subject. Demonstrate evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.							
	C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show general but incomplete grasp of the subject. Demonstrate evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.							
	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. 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. Organization and							

	presentational skills are minimally effective or ineffective.
Textbooks	Thomas Engel: Physical Chemistry (Pearson, latest version) P. W. Atkins: Physical Chemistry (Oxford University Press, latest version)
Remarks	Suggested follow-up courses: CHEM2503, CHEM2510

	-	ecular world (6 credits)	Academic Year	2012					
Offering Department	Chemistry		Quota	230					
Course Co-ordinator		V Yam, Chemistry							
Course Aim	their releva	Γο provide students with the basic principles and knowledge of inorganic and organic chemistry and to introduce heir relevance to biological processes and materials science. This course provides the foundation for further studies in both inorganic and organic chemistry.							
Course Contents	magnetic p complexes stereocher	Acid-base concept; structure and bonding of inorganic and organic compounds; electronic absorption and magnetic properties of metal complexes; chemical reactions of metal complexes: redox and substitution; metal complexes in biology and materials; three-dimensional structure of organic molecules; conformational stereochemistry; chirality, chemistry of selected classes of organic compounds including alkanes, alkenes, and haloalkanes.							
Learning Outcomes	<ul> <li>Understa to selected</li> <li>Demonstr main grou properties</li> <li>Demonst thermodyn chemistry</li> <li>Visualize</li> <li>Recogniz</li> </ul>	n successful completion of this course, students should be able to: Understand the basic principles and concepts of inorganic and organic chemistry and appreciate their relevance selected examples of biological processes and materials science Demonstrate knowledge and understanding of the acid-base concept and definition; the structure and bonding of ain group molecules and metal complexes and their relevance to the electronic absorption and magnetic operties of metal complexes Demonstrate knowledge and understanding of the thermodynamic stability of metal complex formation and the ermodynamic and kinetic aspects of substitution and redox reactions; the role of metal complexes in bioinorganic memistry Visualize and represent/draw three-dimensional, stereochemically correct representations of organic molecules Recognize, discriminate, and name chiral stereoisomers Apply reactions to the synthesis of target molecules							
Pre-requisites	Not for stu	or above in AL or AS Chem; or Pass in CHEM0008); and ot for students who have already passed in CHEM1406 before; and ot for students who have passed in CHEM1401, or have already enrolled in this course.							
Offer in 2012 - 2013	1st sem	2nd sem	Examination	Dec May					
Offer in 2013 - 2014	N								
Teaching Hours	36 hours o	36 hours of lectures and tutorials							
Assessment Method	One 2-hou	r written examination (75% weighting) and continuous assessr	nent (25% weighting)						
Course Grade	A+ to F								
Grade Descriptors	A Demonstrate thorough knowledge and understanding of essential facts, concepts, principles, and theories relating to the bass foundation knowledge of inorganic and organic chemistry, especially those related to acid-base concept; structure and bondir of organic molecules, main group compounds and metal complexes; electronic absorption spectroscopy, magnetic propertie as well as thermodynamic and kinetic aspects of metal complexes and their reactions; conformational stereochemistry chirality; chemistry of alkanes, alkenes and haloalkanes; and their relevance to biological processes and materials science Show strong ability to apply and integrate knowledge and theory relating to the basic foundation knowledge of inorganic ard organic chemistry. Show strong ability to analyze novel problems and critical use of data and experimental results to drat appropriate and insightful conclusions relating to the basic principles and knowledge of inorganic and organic chemistry.								
	В	B Demonstrate substantial command of knowledge and understanding of essential facts, concepts, principles, and theorie relating to the basic foundation knowledge of inorganic and organic chemistry, especially those related to acid-base corces structure and bonding of organic molecules, main group compounds and metal complexes; electronic absorption spectroscop magnetic properties as well as thermodynamic and kinetic aspects of metal complexes; electronic absorption spectroscop magnetics properties as well as thermodynamic and kinetic aspects of metal complexes; and their reactions; conformation stereochemistry; chirality; chemistry of alkanes, alkenes and haloalkanes; and their relevance to biological processes ar materials science. Show evidence to apply and integrate knowledge and theory relating to the basic foundation knowledge inorganic and organic chemistry. Show evidence to analyze novel problems and correct use of data and experimental results draw appropriate conclusions relating to the basic principles and knowledge of inorganic and organic chemistry.							
	С	Demonstrate general but incomplete command of knowledge and understanding of essential facts, concepts, principles, theories relating to the basic foundation knowledge of inorganic and organic chemistry, especially those related to acid-theoret, structure and bonding of organic molecules, main group compounds and metal complexes; electronic absorp spectroscopy, magnetic properties as well as thermodynamic and kinetic aspects of metal complexes and their reactine conformational stereochemistry; chirality; chemistry of alkanes, alkenes and haloalkanes; and their relevance to biolog processes and materials science. Show evidence of some abilities to apply and integrate knowledge and theory relating to basic foundation knowledge of inorganic and organic chemistry. Show ability to analyze problems to most familiar situat and mostly correct but erroneous use of data and experimental results to draw appropriate conclusions relating to the b principles and knowledge of inorganic and organic chemistry.							
	D	Demonstrate partial but limited command of knowledge and understanding of essential facts, concepts, principles, and the relating to the basic foundation knowledge of inorganic and organic chemistry, especially those related to acid-base constructure and bonding of organic molecules, main group compounds and metal complexes; electronic absorption spectros magnetic properties as well as thermodynamic and kinetic aspects of metal complexes and their relevance to biological processes materials science. Show evidence of limited abilities to apply and integrate knowledge and theory relating to the biological processes of investigation knowledge of inorganic chemistry. Show limited ability to analyze problems to most familiar situat and mostly correct but erroneous use of data and experimental results to draw appropriate conclusions relating to the							
	Fail       and mostly correct but erroneous use of data and experimental results to draw appropriate conclusions relating to the laprinciples and knowledge of inorganic and organic chemistry.         Demonstrate little or no evidence of command of knowledge and understanding of essential facts, concepts, principles, theories relating to the basic foundation knowledge of inorganic and organic chemistry, especially those related to acid-concept; structure and bonding of organic molecules, main group compounds and metal complexes; electronic absord spectroscopy, magnetic properties as well as thermodynamic and kinetic aspects of metal complexes and their react conformational stereochemistry; chirality; chemistry of alkanes, alkenes and haloalkanes; and their relevance to biolo processes and materials science. Show little or no evidence of abilities to apply and integrate knowledge and theory relative the basic foundation knowledge of inorganic and organic chemistry. Show little or no ability to analyze problems to familiar situations and erroneous use of data and experimental results to draw appropriate conclusions relating to the principles and knowledge of inorganic and organic chemistry.								

## Department of Chemistry

Textbooks	<ul> <li>F. A. Cotton; G. Wilkinson; P. L. Gaus: Basic Inorganic Chemistry (John Wiley &amp; Sons, 1995, 3rd ed.)</li> <li>D. Shriver, P. Atkins, T. Overton, J. Rourke, M. Weller and F. Armstrong: Inorganic Chemistry, 4th edition, Oxford University Press, 2006</li> <li>J. McMurry, Organic Chemistry, 2008, 7th Edition, Brooks/Cole-Thompson</li> <li>J. McMurry, Study Guide and Student Solutions Manual, 7th Edition, Brooks/Cole-Thomp</li> </ul>
Remarks	Suggested follow-up courses: CHEM2303, CHEM2403, CHEM2109

CHEM1004 Chemist	ry: an expe	erime	ental science	e i (6 cre	eaits)			P P	Academic Year	2012	
Offering Department	Chemistry	у						G	Quota	100	
Course Co-ordinator	Dr A P L To	Tong, C	Chemistry								
Course Aim	opportunity scientific in standardiza substances	To provide students with intensive hands-on training of basic experimental chemistry techniques, and also the opportunity to develop observational and critical thinking skills that are essential for carrying out experiments of scientific investigations. The course covers principles & applications of chemical laboratory skills & techniques standardization and calibration; volumetric analysis; preparation, purification, and characterization of chemica substances; ultraviolet-visible spectrophotometry; infrared spectroscopy; gas & liquid chromatography; statistica data treatment & evaluation.									
Course Contents	standardiza purification spectrosco	The course will include the following topics: laboratory safety practice; general laboratory procedures; standardization and calibration; errors in chemical analyses; statistical data treatment and evaluation; preparation, purification, and characterization of chemical substances; ultraviolet-visible spectrophotometry; infrared spectroscopy; gas and liquid chromatography; thermodynamic measurement; kinetic measurement; and complexation reaction.									
Learning Outcomes	<ul> <li>Demonstr</li> <li>Exercise t</li> <li>Carry out,</li> <li>Use comr</li> <li>Communi</li> </ul>	On successful completion of this course, students should be able to: Demonstrate a good practice of laboratory safety Exercise the proper procedures and regulations for safe handling and use of chemicals Carry out, record and analyze the results of chemical experiments Use common modern instrumentation to characterize compounds and draw conclusions from the results Communicate the results of their work to others Demonstrate problem-solving skills, critical thinking and analytical reasoning									
Pre-requisites	E or above	ve in AL	or AS Chem	; or Pass i	n CHEMC	008.					
Offer in 2012 - 2013	1st sem 2	2nd se	em					E	Examination	No Exam	
Offer in 2013 - 2014	N										
Teaching Hours	12 hours of	of lectu	ires and dem	onstrations	s11 x 4-ho	our of labo	ratory sessio	ns			
Assessment Method	Continuous	us asse	essment (100	%)							
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. Apply highly effective lab skills and techniques. Critical use of data and results to draw appropriate and insightful conclusions. Apply highly effective organizational and presentational skills.									
	В	Demonstrate substantial command of a broad range of knowledge 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 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 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 lab skills and techniques. Mostly correct but some erroneous use of data and results to draw appropriate conclusions. Apply moderately effective organizational and presentational skills.									
	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Apply partially effective lab skills and techniques. Limited ability to use data and results to draw appropriate conclusions. Apply limited or barely effective organizational and presentational skills.										
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Apply minimally effective or ineffective lab skills and techniques. Misuse of data and results and/or unable to draw appropriate conclusions. Organization and presentational skills are minimally effective or ineffective.										
Textbooks	edition) John W. L (Pearson, I	Lehma , latest e	an: Operation	nal Organi	ic Chemi	stry - A F	roblem-Solv	ing Ap	lytical Chemistry proach to the L		

CHEM1009 Basic ch	Academic Year	2012					
Offering Department	Chemistry Quota						
Course Co-ordinator	Dr I K Chu, Chemistry						
Course Aim	This course is designed for non-chemistry major students covering basic principles of chemistry.						
Course Contents	Gas Laws and the Kinetic Theory of Gases Thermodynamics: work, heat, the zeroth and first law of thermodyna capacities, thermochemistry, Hess's Law, Kirchhoff's Law, the second and Gibbs free energy, spontaneity, equilibrium, coupled reaction; Transport Phenomena: diffusion, viscosity of gases, diffusion in liquids and Chemical Kinetics: rate of reactions, orders of reactions, rate laws measurement of reaction rates, enzyme kinetics, enzyme inhibition, temper	third laws of thermoo viscosity of liquids, io reaction mechanis	lynamics, entropy nic conduction;				
	200						

	Equilibria i potential; I Introductio and polypr Introductio identificatio	Chemical Equilibrium; Equilibria in single-, and two component systems: phase transitions, phase diagrams and the phase rule, chemical potential; liquid/liquid systems; Introduction to acids and bases: calculation on concentration of different chemical species in a solution, diprotic and polyprotic acids, activity; Introduction to Spectroscopy: UV/Visible absorption spectroscopy, Beer-Lambert Law; IR Spectroscopy, identification of functional groups; NMR Spectroscopy, Larmor frequency & chemical shift, peak integral, spin-spin coupling multiplicities; Mass Spectrometry, isotopic distribution, determination of molecular formulae.						
Learning Outcomes	- Explain solutions a	On successful completion of this course, students should be able to: - Explain the principles of the thermochemistry, chemical kinetics, chemical equilibrium, physical properties of solutions and gases. - Explain the principles of the spectroscopy, and spectrometry.						
Pre-requisites	Not for stu Not for stu	E or above in AL or AS Chem; and Not for students who have already passed in CHEM1001 before; and Not for students who have already passed in CHEM1007 before; and Not for students who have passed in CHEM1002, or have already enrolled in this course.						
Offer in 2012 - 2013	1st sem	2nd sem	Examination	Dec May				
Offer in 2013 - 2014	Y		1					
Teaching Hours	36 lectures	36 lectures						
Assessment Method	One 2-hou	r written examination (75% weighting) and continuous assess	ment (25% weighting)					
Course Grade	A+ to F							
Grade Descriptors	A Demonstrate thorough knowledge and understanding of essential facts, concepts, principles and theories relating to the modern chemistry, instrumentations and applications of spectrometry and spectroscopy for chemical analysis. Show strong ability to apply and integrate knowledge and theory, and strong ability to analyze problems related to general chemistry and spectroscopy.							
	B Demonstrate substantial command of knowledge and understanding of essential facts, concepts, principles and theories relating to the modern chemistry, instrumentations and applications of spectrometry and spectroscopy for chemical analysis. Show evidence to apply and integrate knowledge and theory, and ability to analyze problems related to general chemistry and spectroscopy.							
	C Demonstrate general but incomplete command of knowledge and understanding of essential facts, concepts, principles and theories relating to the modern chemistry, instrumentations and applications of spectrometry and spectroscopy for chemical analysis. Show evidence of some abilities to apply and integrate knowledge and theory, and to analyze problems to most familiar situations to general chemistry and spectroscopy.							
	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 Demonstrate little or no evidence of command of knowledge and understanding of essential facts, concepts, principles and theories relating to the modern chemistry, instrumentations and applications of spectrometry and spectroscopy for chemical analysis. Show little or no evidence of abilities to apply and integrate knowledge and theory, and little or no ability to analyze problems to most familiar situations related to general chemistry and spectroscopy.							
Textbooks	Spectrose	opy for the biological science, by Gordon G. Hammes, Wiley-I	aterscience (2005)					

CHEM1401 Fundam	entals of o	ganic chemistry (6 credits)		Academic Year	2012		
Offering Department	Chemistry			Quota	120		
Course Co-ordinator	Dr P H Toy	Chemistry					
Course Aim	the contex that form t	The major objective of this course is to give the students a basic understanding of organic chemistry, especially in the context of daily life. This will be achieved through the introduction of the chemistry of organic functional groups that form the basis of organic molecules. The concepts presented in the lectures will be reinforced by a series of laboratory experiments.					
Course Contents	carboxylic	The chemistry of organic functional groups such as alkenes, alkynes, alkyl halides, alcohols, aldehydes, ketones, carboxylic acids and their derivatives, and amines will be discussed, as will the general concepts of molecular structure, conformation and stereochemistry.					
Learning Outcomes	- have a ba - have bas	ful completion of this course, students should sic understanding of the structure of organic n c understanding of the reactivity of organic mo how organic chemistry plays an important ro	nolecules blecules				
Pre-requisites		(E or above in AL or AS Chem; or Pass in CHEM0004 or CHEM0008); and Not for students who have passed CHEM1003, or have enrolled in this course.					
Offer in 2012 - 2013	1st sem			Examination	Dec		
Offer in 2013 - 2014	Y						
Teaching Hours	24 lectures	and 5 x 4-hour laboratory sessions					
Assessment Method	One 2-hou	written exam (60%), 2 mid-term tests and 5 e	experiments (40% tot	al)			
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.						
		Demonstrate general but incomplete command of organic chemistry knowledge, and skills required for attaining most of the					
		310					

	С	course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar problems.			
	D	Demonstrate partial but limited command of organic chemistry knowledge, and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems.			
	Fail	Demonstrate little or no evidence of command of organic chemistry knowledge, and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems.			
Textbooks	Bruice, P	Bruice, P.Y.; Essential Organic Chemistry (Pearson, 2010, 2nd Edition)			
Remarks	Students	who are planning to take CHEM2403 should take CHEM1003.			

CHEM1410 Basic ch	emistry p	rinciples for pr	mistry principles for pharmacy students (6 credits)			2012	
Offering Department	Chemistry	у			Quota	30	
Course Co-ordinator	Dr E L M	Dr E L M Wong, Chemistry					
Course Aim	This cour	se is designed to i	ntroduce basic principles of chem	istry to Bachelor	of Pharmacy stude	nts.	
Course Contents	Chemical experime Chemical Acids and activity; Basic Sp	Bas 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; applications in pharmacokinetics Chemical Equilibrium; cids and bases: pH values in aqueous solution, importance in biological systems, diprotic and polyprotic acids, ictivity; Basic Spectroscopy and Spectrometry Techniques and their applications: UV/Visible absorption spectroscopy; MRR spectroscopy; Mass Spectrometry.					
Learning Outcomes	- Demons equilibrium - Demon	strate knowledge a m, physical proper	e, the students should be able to: and understanding of basic princi ties of solutions and gases that ar and understanding principles cal sciences	re essential to ph	armaceutical scien	ces	
Pre-requisites	E or abov	For BPharm students only; and E or above in AL or AS Chem; and Not for students who have passed in CHEM1009, or have already enrolled in this course.					
Offer in 2012 - 2013	2nd sem				Examination	May	
Offer in 2013 - 2014	Y						
Teaching Hours	36 lecture	es					
Assessment Method	One 2-ho	our written examina	ation (75% weighting) and course	work assessmen	t and tests (25% we	eighting)	
Course Grade	A+ to F						
Grade Descriptors	A	modern chemistry,	bugh knowledge and understanding of e instrumentations and applications of spe d integrate knowledge and theory, and st	ectrometry and spec	troscopy for chemical a	nalysis. Show stron	
	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 Demonstrate little or no evidence of command of knowledge and understanding of essential facts, concepts, principles and theories relating to the modern chemistry, instrumentations and applications of spectrometry and spectroscopy for chemical analysis. Show little or no evidence of abilities to apply and integrate knowledge and theory, and little or no ability to analyze problems to most familiar situations related to general chemistry and spectroscopy.						

CHEM1411 Fundam credits)	entals of Organic Chemistry for Pharmacy Students (6	Academic Year	2012				
Offering Department	Chemistry	Quota	30				
Course Co-ordinator	Dr P H Toy, Chemistry						
Course Aim	The major objective of this course is to give pharmacy students a basic understanding of organic chemistry, especially in the context of daily life. This will be achieved through the introduction of the chemistry of organic functional groups that form the basis of organic molecules. The concepts presented in the lectures will be reinforced by a series of laboratory experiments.						
Course Contents							

Learning Outcomes	On successful completion of this course, students should be able to: - have a basic understanding of structure of organic molecules - have a basic understanding of the reactivity of organic molecules - have an appreciation of how organic chemistry plays an important role in everyday life							
Pre-requisites	E or abo	For BPharm students only; and E or above in AL/AS Chemistry; and Not for students who have passed in CHEM1401, or have already enrolled in this course.						
Offer in 2012 - 2013	1st sem				Examination	Dec		
Offer in 2013 - 2014	Y							
Teaching Hours	24 lectur	24 lectures, 5 tutorials, 5 x 4-hour laboratory sessions						
Assessment Method	One 2-h	One 2-hour written examination (60% weighting), 2 mid-term tests and 5 experiments (40% total)						
Course Grade	A+ to F	A+ to F						
Grade Descriptors	A	A Demonstrate thorough mastery at an advanced level of extensive organic chemistry knowledge, and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar problems.						
	в	Demonstrate substantial command of organic chemistry with a broad range of knowledge, and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar problems.						
	С	C Demonstrate general but incomplete command of organic chemistry knowledge, and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar problems.						
	D	Demonstrate partial but limited command of organic chemistry knowledge, and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems.						
	Fail Demonstrate little or no evidence of command of organic chemistry knowledge, and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems.							
Textbooks	Bruice, F	P.Y.; Essential Orga	anic Chemistry (Pearson, 201	0, 2nd Edition)				
Remarks	This cou	irse is available to r	pharmacy students only.					

CHEM2003 Introductory instrumental chemical analysis (6 credits)			Academic Year	2012	
Offering Department	Chemistry		Quota	100	
Course Co-ordinator	Dr W T Chan, Chemistry				
Course Aim	This course is designed for non-chemistry major students covering basic principles of separation and spectroscop for chemical analysis. This course provides a general foundation for further studies in pharmacology, life an environmental sciences.				
Course Contents	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. Analysis and quality assurance: statistical analysis of small sets of data, control chart.				
Learning Outcomes	<ul> <li>On successful completion of this course, students should be able to:</li> <li>Explain the principles of the optical methods, separation methods, and mass spectrometry.</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> </ul>				
Pre-requisites	Pass in CHEM1002 or CHEM1007 or CHEM1009; and Not for students who have passed CHEM2202, or have already enrolled in this course.				
Offer in 2012 - 2013	2nd sem		Examination	Мау	
Offer in 2013 - 2014	Υ				
Teaching Hours	24 lectures and 7 x 4-hour laboratory sessions				
Assessment Method	One 2-hour written examination (75% weighting) and course work assessment (25% weighting)				
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.				
	C Demonstrate general but incomplete grasp of the subject. Show evidence of some analytical abilities and logical thinking, little evidence of independent thinking, and ability to apply knowledge to most familiar situations. Demonstrate adequate lab skills and techniques and mostly correct but some erroneous use of data and results to draw appropriate conclusions. Demonstrate moderately effective organization and presentation skills				
		moderately effective organization and presentation skills			

		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.	
Textbooks		g, F.K. Holler, S.R. Crouch: Principles of Instrumental Analysis (Thomson, latest edition). g, D.M. West, F.J. Holler, and S.R. Crouch: Fundamentals of Analytical Chemistry (Thomson, latest	

CHEM2102 Environr	nental cher	nistry (6 credits)		Academic Year	2012	
Offering Department	Chemistry			Quota	100	
Course Co-ordinator	Dr W T Chan, Chemistry					
Course Aim	This course introduces students to Environmental Chemistry and enables them to understand the chemica principles involved in various environmental phenomena and processes.					
Course Contents	Atmosphere chemistry: atmospheric composition and behavior, ozone in the stratosphere, chemistry of the troposphere, air pollution Water Chemistry: property of water, water resources and cycle, chemical quality of natural water, acid-base chemistry, oxidation-reduction chemistry, water purification Organic pollutants: persistent organic pollutants, pesticides, toxicology Energy: energy resources, fossil fuels, solar energy, nuclear energy, energy conversion (heat engine, fuel cells) Waste treatment: domestic and hazardous waste treatment (landfill, incineration, air stripping, adsorption, oxidation)					
Learning Outcomes	<ul> <li>On successful completion of this course, students should be able to:</li> <li>Demonstrate knowledge on chemical principles of the various environmental phenomena and processes.</li> <li>Describe the practical processes of chemistry in atmosphere, water purification, waste treatment, and energy production.</li> <li>Critically discuss local and global environmental issues based on scientific principles and data.</li> <li>Apply knowledge to analyze chemical processes involved in various environmental problems</li> </ul>					
Pre-requisites	Pass in CH	EM1002 or CHEM1003 or CHE	EM1007 or CHEM1009 or CHEM	11401		
Offer in 2012 - 2013	1st sem			Examination	Dec	
Offer in 2013 - 2014	Υ					
Teaching Hours	24 lectures, 12 tutorials, plus optional 5 x 1-hour guided study					
Assessment Method	One 2-hour written examination (75% weighting) and course work assessment (25% weighting)					
Course Grade	A+ to F					
Grade Descriptors	A	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.					
	C Demonstrate general but incomplete grasp of the subject. Show evidence of some analytical abilities and logical thinking, littl evidence of independent thinking, and ability to apply knowledge to most familiar situations. Demonstrate adequate lab skill 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.					
Textbooks	C. Baird and M. Cann: Environmental Chemistry, Freeman, latest edition. S.E. Manahan: Environmental Chemistry, Lewis Publishers, latest edition.					

CHEM2103 Chemica	Academic Year	2012					
Offering Department	Chemistry	Quota	100				
Course Co-ordinator	Prof K Y Chan, Chemistry						
Course Aim	To familiarize with typical chemical industries important in local and global economy. To understand the technology of chemicals manufacturing and chemical processes in general industry.						
Course Contents	Process flow charts, units and conversions, materials and energy balances, unit operations. Selection of chemical processes to include variation in products, scale, and types of operation, e.g. for petrochemical industries, industrial gases, beverage processes, chloroalkaline manufacturing.						
Learning Outcomes	On successful completion of this course, students should be able to: - Solve basic problems of energy and mass balances in chemical and environmental processes. - Be familiarized with a few common chemical industries and chemical processes. - Understand some general principles of industrial practice through plant visits.						

Pre-requisites	Pass in	CHEM1002 or CHEM1502 or CHEM1007 or CHEM10	009						
Offer in 2012 - 2013	2nd sem								
Offer in 2013 - 2014	Y								
Teaching Hours	24 lectur	lectures and 6 tutorials. Field work: about 1-2 plant visits							
Assessment Method	One 2-h	our written examination (70% weighing). Continuous	assessment (30% weighing)						
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	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.							
	с	Demonstrate general but incomplete knowledge of industrial chemical processes and command of mass and energy balance skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities are logical thinking, and ability to apply knowledge solve problems to most familiar situations. Mostly correct but some erroneou use of data and references. Apply moderately effective organizational and presentational skills.							
	D	Demonstrate partial but limited knowledge of industrial chem required for attaining some of the course learning outcomes limited analytical and critical abilities. Show limited ability to a source references. Apply limited or barely effective organizati	s. Show evidence of some coherent and lo apply knowledge to solve problems. Limited	gical thinking, but with					
	Fail	Demonstrate little or no evidence of knowledge of industrial chemical processes and command of mass and energy balance skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Misuse of data and references. Organization and presentational skills are minimally effective or ineffective.							
Textbooks	Felder a	Felder and Rousseau: Elementary Principles of Chemical Processes							

CHEM2109 Introduc	tion to mat	erials chemistry (6 credits)	Academic Year	2012							
Offering Department	Chemistry		Quota	100							
Course Co-ordinator	Prof W K C	of W K Chan, Chemistry									
Course Aim		is course provides an introduction to materials chemistry. Some basic material characterization techniques will to be introduced. This course is essential for students who wish to take advanced materials course.									
Course Contents	synthesis a	assification of materials; introduction to organic polymers: molecular weight, polymerization reaction, polymer inthesis and characterization; ceramics; semiconducting materials; applications of different materials; materials maracterizations.									
Learning Outcomes	<ul> <li>describe</li> <li>understat</li> <li>of polymer</li> <li>identify e</li> <li>their physic</li> </ul>	On successful completion of this course, students should be able to: - describe different materials classification and to explain the concept of structure/property relationship; - understand the concept of molecular weight distribution in polymers, and explain how it is affected by the kine of polymerization reactions; - identify examples of some important polymers, and explain how the molecular structure of these polymers af their physical properties; - demonstrate knowledge in materials characterizations.									
Pre-requisites	Pass in CH	EM1003 or CHEM1009 or CHEM1401									
Offer in 2012 - 2013	1st sem		Examination	Dec							
Offer in 2013 - 2014	Y										
Teaching Hours	36 hours le	ecture/tutorial/discussion sessions									
Assessment Method	One 2-hou	r written examination (70%), continuous assessment (30%)									
Course Grade	A+ to F										
Grade Descriptors	A	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.									
	В	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	Demonstrate general but incomplete command of knowledge and understanding of essential facts, concep theories relating to the classification of materials, materials properties, synthesis and characterization of po and applications of common polymers. Show evidence of some abilities to apply and integrate knowledge a to the synthesis and applications of materials. Show ability to analyze problems to most familiar situations a but erroneous use of data and experimental results to draw appropriate conclusions relating to material characterization.									
	D	Demonstrate partial but limited command of knowledge and understanding of es relating to the classification of materials, materials properties, synthesis and applications of common polymers. Show evidence of limited abilities to apply a the synthesis and applications of materials. Show limited ability to analyze pr correct but erroneous use of data and experimental results to draw appropriate characterization.	characterization of poly and integrate knowledge oblems to most familiar	mers, properties and and theory relating to situations and mostly							
	<ul> <li>Characterization.</li> <li>Demonstrate little or no evidence of command of knowledge and understanding of essential facts, concepts, principles, theories relating to the classification of materials, materials properties, synthesis and characterization of polymers, proper and applications of common polymers. Show little or no evidence of abilities to apply and integrate knowledge and th relating to the synthesis and applications of materials. Show little or no ability to analyze problems to most familiar situations.</li> </ul>										

	and erroneous use of data and experimental results to draw appropriate conclusions relating to materials synthesis and characterization.
Textbooks	F. W. Billmeyer: Textbook of Polymer Science (John Wiley and Sons, 1984) G. Odian: Principles of Polymerizations (John Wiley and Sons, 2004) M. P. Stevens: Polymer Chemistry: An Introduction (Oxford University Press, 1999)

CHEM2111 Directed	stuales in	n chen	nistry (6 cre	edits)			Academic Year	2012	
Offering Department	Chemistry	ry					Quota		
Course Co-ordinator	Prof D L F	Phillips,	, Chemistry						
Course Aim						d like to take an e ojects by themsel	early experience on ves.	research. It offer	
Course Contents	contents a	Students interested in taking this course should contact their prospective supervisors in May to determine the ontents and the nature of their project in the coming academic year. Prior approval from both the prospective upervisor and the course coordinator is required.							
Learning Outcomes	- Understa the course - Demonst	tand the se strate kr	e terminology a nowledge and	and nomencl understandi	ng of basic conce	with the small sca	ale chemical projec eir chemical projec wider area of chem	t	
Pre-requisites	Pass in Cl	CHEM10	002 or CHEM1	1003 or CHE	M1004 or CHEM	1406 or CHEM25	07 or CHEM2510.		
Offer in 2012 - 2013	Year long	g					Examination	No Exam	
Offer in 2013 - 2014	Y								
Teaching Hours			meetings to b n the project.	e arranged I	by the student an	d the supervisor.	The student is exp	pected to spend a	
Assessment Method	Assessme	nent is b	y a written rep	ort and an o	ral examination.				
Course Grade	A+ to F								
Grade Descriptors	A Show an extensive comprehension of the subject. Demonstrate very able analytical and critical thought with presence of some originality. Illuminating utilization and critical analysis / evaluation of information acquired from a wide range of high quality sources. Critical employment of data and results to synthesize appropriate and illuminating conclusions. Demonstrate integration of a wide range of appropriate theories, principles, data and methods. Employ very effective organizational and presentational skills. [Work of A+ should demonstrate substantial additional work beyond that is required in wider areas relevant to the topic.]								
	B Show a substantial comprehension of the subject. Demonstrate able analytical and critical thinking with use of relevant information from sources. Demonstrate ability to compose meaningful comparisons between different secondary interpretations. Correct utilization of data and results to form appropriate conclusions. Compose general integration of theories, principles, data and methods. Perform effective organizational and presentational skills.								
	C Show a general but incomplete comprehension of the subject. Presence of some analytical and critical thinking with use of relevant information from sources. Demonstrate ability to compose comparisons between different interpretations. Mainly correct but some incorrect utilization of data and results to form appropriate conclusions. Demonstrate some partial integration of theories, principles, data and methods. Perform moderately effective organizational and presentational skills.								
	<ul> <li>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.</li> </ul>								
	Failhow little or no comprehension of the subject. Evidence of little or lack of analytical and critical abilities, logical and coherent thinking. Limited employment of secondary sources and no critical comparison of them. Incorrectly utilize data and results and/or unable to form appropriate conclusions. Demonstrate little or no integration of theories, principles, data and methods. Organization and presentational skills are of very limited use or ineffective.								
					are of very limited us	e or ineffective.			
References		Orga	inization and pres	entational skills	are of very limited us				

CHEM2202 Chemica	Il instrumentation (6 credits)	Academic Year	2012
Offering Department	Chemistry	Quota	80
Course Co-ordinator	Dr W T Chan, Chemistry		
Course Aim	To cover the basic principles and applications of chemical instrumer knowledge, in addition to the principles, of instruments that are common		
Course Contents	Optical methods: Beer's Law; UV-visible, infrared, and atomic spectrometry; grating spectrometer; photon detectors and thermal detec	ectors. hance liquid chromatograph trospray ionization (ESI) ar	y (HPLC) and ga
Learning Outcomes	nd mass spectrometry. sic components of the instru preparation, standard solu s)		

Pre-requisites	Pass in CH	EM1002 or (CHEM1004 and CHEM	2510) or CHEM1007 or CHE	M1009				
Offer in 2012 - 2013	1st sem			Examination	Dec			
Offer in 2013 - 2014	Y							
Teaching Hours	24 lectures	, 12 tutorials, and 7 x 4-hour laborate	ory sessions					
Assessment Method		ne 2-hour written examination (75% weighting) and course work assessment which includes laboratory work and sts (25% weighting)						
Course Grade	A+ to F	+ 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	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 evidence of independent thinking, and abili and techniques and mostly correct but som moderately effective organization and prese	ty to apply knowledge to most fam e erroneous use of data and results	iliar situations. Demonstra	ate adequate lab 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.							
Textbooks	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)							

CHEM2207 Food an	d water ana	alysis (6 credits)	Academic Year	2012						
Offering Department	Chemistry		Quota	120						
Course Co-ordinator	Dr Y S Fun	Dr Y S Fung, Chemistry								
Course Aim		To cover areas in the application and new methodology development in Analytical Chemistry with focus on food and water analysis.								
Course Contents		Analysis in Practicing Laboratories: Use of standard metho ntal analysis; good laboratory practice; reliability and quality i		ards for food ar						
		lysis: QA/QC and automation in water analysis; sampling, p onmental and industrial processing waters; quality standards								
	Food Analysis: Requirement of nutritional labeling; analysis of major composition, minor additives and trace contaminants in food; analysis of natural and imitated food products; recent issues and case studies in food analysis.									
	New Techniques: Selective electrodes; electrophoresis and mass spectrometry for food and water analysis.									
Learning Outcomes	<ul> <li>identify an</li> <li>apply mea</li> <li>demonstration</li> <li>understan</li> </ul>	sful completion of this course, students should be able to: nd determine errors and uncertainty of analytical results asures taken to control quality and ensure reliability of analyt ate a general knowledge in food and water analysis id issues in public health protection related to chemical analy analytical techniques used in practicing food and water labor	rsis							
Pre-requisites		EM1002 or CHEM1003 or CHEM1004 or CHEM1007 or CH EM2202, or already enrolled in this course.	EM1009; and							
Offer in 2012 - 2013	2nd sem		Examination	Мау						
Offer in 2013 - 2014	Y									
Teaching Hours	24 lectures,	, 8 tutorials and 4 x 4-hour laboratory sessions								
Assessment Method		r written examination (75% weighting) and coursework a work, assignments, and tests	ssessment (25% weighti	ng) that include						
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.			
	D	Demonstrate a partial but limited command of knowledge and skills required for attaining some of the course learning outcomes in Food and Water Analysis. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems related to the analysis of food and water. Apply limited or barely effective organization and presentation skill as shown in class work.			
	Fail	Demonstrate little or no evidence for the command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems related to the analysis of food and water. Organization and presentation skills are minimally effective or ineffective as shown in class work.			
Textbooks	D. A. Sko latest edit	og, D. M. West, and F. J. Holler: Fundamentals of Analytical Chemistry (Brook/Cole -Thomson Learning, ion)			
References	Reference	References to specialist texts and other published material will be made throughout the course.			

	_	nic Chemistry (6 credits)	Academic Year	2012						
Offering Department	Chemistry	nemistry Quota 80 rof V W W Yam, Chemistry								
Course Co-ordinator	Prof V W V									
Course Aim	inorganic c	is course is a continuation from 'Chemistry: the molecular world', with a more detailed treatment of general organic chemistry, with examples relevance to biological processes and material science, suited to the needs of ose intending to extend their studies in chemistry.								
<b>Course Contents</b> Chemistry of selected classes of inorganic, coordination and organometallic compounds including mediate their reaction where appropriate.										
	Structure, systems.	onding, magnetism and spectral properties of i	norganic systems including example	es in bioinorgan						
Learning Outcomes	- Demonst compounds - Understat - Understat compounds	Understand structure, bonding, magnetism and spectral properties of inorganic systems. Understand mechanisms of selected chemical reactions that are essential to coordination and organometallic								
Pre-requisites		EM1003; and ents who have already passed in CHEM2302 be	fore.							
Offer in 2012 - 2013	1st sem		Examination	Dec						
Offer in 2013 - 2014	Y									
Teaching Hours	24 lectures	6 tutorials and 6 x 4-hour laboratory sessions								
Assessment Method	One 3-hou (25%)	written examination (75% weighting). Continu	ous assessment of practical work a	and assignment						
Course Grade	A+ to F									
Grade Descriptors	A Demonstrate thorough 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 strong ability to apply and integrate knowledge and theory relating to the more advanced foundation knowledge of inorganic chemistry. Show strong ability to analyze novel problems and critical use of data and experimental results to draw appropriate and insightful conclusions relating to the essential and more advanced foundation principles and knowledge of inorganic chemistry. Demonstrate highly effective laboratory skills and techniques, especially in the synthesis and reactivity study of inorganic compounds and metal complexes, and their characterization by various spectroscopic methods.									
	В	Demonstrate substantial command of knowledge and unrelating to the more advanced foundation knowledge of ino of inorganic, coordination and organometallic compounds; inorganic systems including examples in bioinorganic systere relating to the more advanced foundation knowledge of incorrect use of data and experimental results to draw app foundation principles and knowledge of inorganic compouse in the synthesis and reactivity study of inorganic compousepectroscopic methods.	rganic chemistry, especially those related to s mechanisms of reactions; and magnetic and sms. Show evidence to apply and integrate ku organic chemistry. Show evidence to analyze ropriate conclusions relating to the essential Demonstrate effective laboratory skills and t	spectral properties of nowledge and theory novel problems and and more advanced echniques, especially						
	С	Demonstrate general but incomplete command of knowled theories relating to the more advanced foundation knowled bonding of inorganic, coordination and organometallic co properties of inorganic systems including examples in bio integrate knowledge and theory relating to the more advar analyze problems to most familiar situations and mostly co appropriate conclusions relating to the essential and mo chemistry. Demonstrate moderately effective laboratory skil inorganic compounds and metal complexes, and their chara	ge of inorganic chemistry, especially those rel mpounds; mechanisms of reactions; and ma inorganic systems. Show evidence of some a need foundation knowledge of inorganic chem orrect but erroneous use of data and experim ore advanced foundation principles and kno Is and techniques, especially in the synthesis a	lated to structure and agnetic and spectra abilities to apply and histry. Show ability to rental results to draw wledge of inorganic						
	Demonstrate partial but limited complexes, and their characterization by various spectroscopic methods. Demonstrate partial but limited command of knowledge and understanding of essential facts, concepts, principles, and the relating to the more advanced foundation knowledge of inorganic chemistry, especially those related to structure and b of inorganic coordination and organometallic compounds; mechanisms of reactions; and magnetic and spectral prope inorganic systems including examples in bioinorganic systems. Show evidence of limited abilities to apply and int knowledge and theory relating to the more advanced foundation knowledge of inorganic chemistry. Show limited at analyze problems to most familiar situations and mostly correct but erroneous use of data and experimental results to appropriate conclusions relating to the essential and more advanced foundation principles and knowledge of inor chemistry. Demonstrate partially effective laboratory skills and techniques, especially in the synthesis and reactivity st inorganic compounds and metal complexes, and their characterization by various spectroscopic methods.									
		Demonstrate little or no evidence of command of knowled theories relating to the more advanced foundation knowled bonding of inorganic, coordination and organometallic co properties of inorganic systems including examples in bioin	ge of inorganic chemistry, especially those rel mpounds; mechanisms of reactions; and ma	ated to structure and agnetic and spectra						

	Fail	integrate knowledge and theory relating to the more advanced foundation knowledge of inorganic chemistry. Show little or no ability to analyze problems to most familiar situations and erroneous use of data and experimental results to draw appropriate conclusions relating to the essential and more advanced foundation principles and knowledge of inorganic chemistry. Demonstrate minimally effective laboratory skills and techniques, especially in the synthesis and reactivity study of inorganic compounds and metal complexes, and their characterization by various spectroscopic methods.	
	-Shriver & Atkins, Inorganic Chemistry (4th Ed.), Oxford University Press, 2005 - Catherine, Housecroft & Sharpe, Inorganic Chemistry (3nd Ed.), Prentice Hall, 2008		

CHEM2304 Bioinorg	anic Chem	mistry	(o creatts)			Academic Year	2012			
Offering Department	Chemistry	ry			Quota	50				
Course Co-ordinator	Prof H Z S	Prof H Z Sun, Chemistry								
Course Aim	more deta	tails of science	inorganic chemi	istry in biolog	ical system, v	with examples rel	rganic Chemistry, g levance to biologica lies in (bio)chemistr	al processes an		
Course Contents	behind the mechanism	ioinorganic Chemistry of selected topics of interest. Examples include the inorganic chemistry (and biochemistry) ehind the requirement of biological cells for metals such as zinc, iron and copper; and metals in medicine such as techanisms by which organisms obtain required metal ions from their environment, and use of metal-containing ompounds in treating diseases such as cancer.								
Learning Outcomes	- Understa - Understa - Understa	stand the stand str stand ch	ructure, bonding,	concepts of in and spectral sms of selecte	organic/organ properties of s d metal home	ic chemistry in bic elected metals in	logical system. proteins and nuclei e, transport and sto			
Pre-requisites	Pass in CH	CHEM1	002 and CHEM1	003 and CHE	M2303					
Offer in 2012 - 2013	2nd sem	1					Examination	May		
Offer in 2013 - 2014	Y									
Teaching Hours	36 lectures	res, 6 tu	itorials and 6 hou	irs of literature	e survey and p	resentation				
Assessment Method	One 3-hou	our writt	ten examination (	(75% weightin	ig). Continuou	s assessment of a	assignments and pro	esentation (25%)		
Course Grade	A+ to F									
	A Demonstrate thorough knowledge and understanding of essential facts, concepts, principles, and theories relating to the base foundation knowledge of bioinorganic chemistry, especially those related to hard-soft acid-base theory; chelation; structure are bonding of metals in biological systems; thermodynamic and kinetic aspects of metal ions in biological processes and the relevance to metal homeostasis; metal-based drugs. Show strong ability to apply and integrate knowledge and theory relatir to the basic foundation knowledge of bioinorganic chemistry. Show strong ability to analyze novel problems and knowledge of bioinorganic chemistry. Demonstrate highly effective basic techniques, especially in the characterization of inorganic active si and overall metallo-biomolecules. Demonstrate substantial command of knowledge and understanding of essential facts, concepts, principles, and theorie relating to the basic foundation knowledge of bioinorganic chemistry, especially those related to hard-soft acid-base theorie relating to the basic foundation knowledge of bioinorganic chemistry.									
	В	proce theor corre bioin	cesses and their releve ory relating to the base ect use of data and e	vance to metal ho sic foundation kn experimental resu Demonstrate effe	meostasis; metal lowledge of bioin llts to draw appro	based drugs. Show e organic chemistry. Sh priate conclusions rela	and kinetic aspects of m vidence to apply and inte ow evidence to analyze ating to the basic princip e characterization of inor	grate knowledge an novel problems and les and knowledge of		
	с	theore theore biolo and analy appro-	pries relating to the b bry; chelation; structu ogical processes and integrate knowledge lyze problems to mos ropriate conclusions	asic foundation has and bonding of their relevance and theory related and theory related frequencies familiar situation relating to the b	knowledge of bioi of metals in biolo to metal homeost ating to the basic ons and mostly c asic principles an	norganic chemistry, e gical systems; thermo asis; metal-based dru foundation knowledg prrect but erroneous o nd knowledge of bioir	g of essential facts, cond specially those related tr dynamic and kinetic asp gs. Show evidence of si e of bioinorganic chem use of data and experim organic chemistry. Den te and overall metallo-bio	o hard-soft acid-basi bects of metal ions in ome abilities to appli istry. Show ability to ental results to draw nonstrate moderatel		
	D	relati chela proce integ analy appre	ting to the basic four ation; structure and b cesses and their rele grate knowledge and lyze problems to mos ropriate conclusions	ndation knowledg bonding of metals evance to metal I theory relating t st familiar situation relating to the	e of bioinorganic in biological syst homeostasis; me to the basic found ons and mostly c basic principles	chemistry, especially tems; thermodynamic stal-based drugs. Sho dation knowledge of b porrect but erroneous of and knowledge of bi	ential facts, concepts, pr those related to hard-s and kinetic aspects of m wevidence of limited a ioinorganic chemistry. S use of data and experim oinorganic chemistry. Le and overall metallo-bid	oft acid-base theory tetal ions in biologica bilities to apply and how limited ability to tental results to draw bemonstrate partially		
	<ul> <li>Fail</li> <li>Demonstrate little or no evidence of command of knowledge and understanding of essential facts, concepts, principles, and theories relating to the basic foundation knowledge of bioinorganic chemistry, especially those related to hard-soft acid-basic 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 little or no evidence of abilities to apply and integrate knowledge and theory relating to the basic foundation knowledge of bioinorganic chemistry. Show little or no ability to analyze problems to most familiar situations and erroneous use of data and experimental results to draw appropriate conclusions relating to the basic principles and knowledge of bioinorganic chemistry. Demonstrate minimally effective basic techniques, especially in the characterization of inorganic active site and overall metallo-biomolecules.</li> </ul>									
Textbooks	1994 2. Bertini,	ni, I.; Gr	0	el, E. I.; Vale	Ū		rsity Science Books Inorganic Chemist			

CHEM2403 Intermed	Academic Year	2012	
Offering Department	Chemistry	Quota	90

Course Co-ordinator	Prof D Yang, Chemistry						
Course Aim	primarily o	nuation from CHEM1003, this course aims to provide a solid f on the basic principles to understand the structure and react the role of organic chemistry in biology, medicine, and industry	vity of organic molecu				
Course Contents		of common organic functional groups: ketones and aldehydd d heterocycles; aromatic chemistry. Principles of organic synth		nd their derivatives;			
Learning Outcomes	On successful completion of this course, students should be able to: - Define and employ the vocabulary of organic chemistry - Draw correct structural representations of organic molecules - Understand the basic principles of structure and reactivity of organic molecules - Write reasonable mechanisms for transformations of carbonyl compounds (aldehydes, ketones, carboxylic acids, acyl halides, anhydrides, esters, amides), nitriles, and amines - Appreciate the importance of organic chemistry in daily life - Devise synthetic pathways to organic compounds using functional group chemistry - Perform the laboratory synthesis, purification, and characterization of organic compounds						
Pre-requisites	Pass in CH	Pass in CHEM1003; and Pass in CHEM2510, or already enrolled in this course; Not for students who have already passed in CHEM2402 before.					
Offer in 2012 - 2013	2nd sem		Examination	May			
Offer in 2013 - 2014	Y						
Teaching Hours	24 lectures	s, 6 tutorials, 6 x 4 hour laboratory					
Assessment Method	One 3-hou	r written examination (60% weighting) and continuous assessi	nent (40%).				
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 lab skills 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. Apply effective lab skills and techniques.					
	С	Demonstrate general but incomplete command of knowledge and skills outcomes. Show evidence of some analytical and critical abilities and logi familiar situations. Apply moderately effective lab skills and techniques.					
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning ou Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited a apply knowledge to solve problems. Apply partially effective lab skills and techniques.					
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Apply minimally effective or ineffective lab skills and techniques.						
Textbooks	S. McMurr 2012.	y, "Organic Chemistry", 8th Ed., Thomson Brooks/Coles, 2012 y, "Study Guide and Student Solutions Manual for Organic Ch nan, "Operational Organic Chemistry", 4th Ed., Pearson/Prentic	emistry", 8th Ed., Thor	nson Brooks/Coles,			

CHEM2410 Analytic	al techniques for pharmacy students (6 credits)	Academic Year	2012		
Offering Department	Chemistry	Quota	30		
Course Co-ordinator	Dr W T Chan, Chemistry				
Course Aim	This course is designed for Bachelor of Pharmacy students to provide an measurement techniques that are important to pharmacology and pharmace		ent analytical and		
Course Contents	<ul> <li>Principles and Applications of different analytical and measurement techniques in pharmaceutical sciences such as drug analysis and pharmacokinetics studies</li> <li>Analysis and quality assurance: statistical analysis of data, control chart.</li> <li>Analysis by Optical methods: Beer's Law; instrumentation, grating spectrometer, detectors; absorption spectrometry: UV-visible, infrared, and atomic; emission spectrometry.</li> <li>Sample Separation and Purification: partition; chromatography theories; high performance liquid chromatography (HPLC) and gas chromatography (GC); instrumentation of HPLC and GC.</li> <li>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 guadrupole (Q) mass analyzers; use of mass spectrometry in drug analysis.</li> </ul>				
Learning Outcomes	<ul> <li>On completion of the course, the students should be able to:</li> <li>Demonstrate knowledge and understanding of the principles of different of mass spectrometry and their applications in pharmaceutical sciences</li> <li>Describe the basic experimental set up and the properties of the basic complaboratory classes.</li> <li>Apply experimental skills in chemical analysis including sample preparainstrument calibration, matrix effects correction (standard additions).</li> </ul>	ponents of the instru	ments used in the		
Pre-requisites	For BPharm students only; and Pass in CHEM1410				

Offer in 2013 - 2014	Y				
Teaching Hours	24 lectures and 7 x 4-hour laboratory sessions				
Assessment Method	One 2-hour written examination (75% weighting) and course work assessment (25% weighting)				
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.				
	C Demonstrate general but incomplete grasp of the subject. Show evidence of some analytical abilities and logical thinking, little evidence of independent thinking, and ability to apply knowledge to most familiar situations. Demonstrate adequate lab skills and techniques and mostly correct but some erroneous use of data and results to draw appropriate conclusions. Demonstrate moderately effective organization and presentation skills.				
	D Demonstrate partial but limited grasp, with retention of some relevant information, of the subject. Show evidence of limited analytical abilities, little or no evidence of independent thinking, and limited ability to apply knowledge to solve problems. Demonstrate partially effective lab skills and techniques and limited ability to use data and results to draw appropriate conclusions. Demonstrate limited or barely effective organization and presentation skills.				
	Fail 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.				
Textbooks	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).				
Remarks	This course is for pharmacy students only. This course is equivalent to CHEM2003.				

CHEM2504 Physical credits)	l Chemistry	I: Introduction to Quantum Chemistry (6	Academic Year	2012				
Offering Department	Chemistry		Quota	80				
Course Co-ordinator	Prof A S C	Cheung, Chemistry						
Course Aim		e presents fundamental principles and topics on quanti for students intending to further their studies in chemistry.	um chemistry in order to	provide a soile				
Course Contents	mechanics, particle in a structure a	Elementary quantum mechanics: Historical development, Postulates of quantum mechanics, Principles of quantum mechanics, Theory of angular momentum, Heisenberg uncertainty principle. Applications to simple systems: particle in a box, harmonic oscillator, rigid rotator; Atomic structure: Hydrogen and many electron atoms. Molecular structure and chemical bonds. Approximation methods: variational method, Hartree-Fock method, valence bond theory, and perturbation theory.						
Learning Outcomes	-understand -demonstra structure -understand systems.	-understand elementary numerical procedures and the basic relationships of quantum mechanics and molecula						
Pre-requisites		Pass in CHEM1002; and Not for students who have already passed in CHEM2503 before.						
Offer in 2012 - 2013	2nd sem		Examination	Мау				
Offer in 2013 - 2014	Y							
Teaching Hours	24 lectures	6 tutorials and 6x 4-hour laboratory sessions						
Assessment Method	One 2-hou (25%)	r written examination (75% weighting). Continuous asse	essment of practical work	and assignmen				
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 thorough grasp of the subject, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective lab skills and techniques. Critical use of data and results to draw appropriate and insightful conclusions.							
	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.							
	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show partial but limited grasp of the subject, retention of some relevant information of the subject, ability to apply knowledge to solve problems. Apply partially effective lab skills and techniques. Limited ability to use data and results to draw appropriate conclusions.							
	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 little or no grasp of the knowledge and understanding of the subject, very little or no ability to apply knowledge to solve problems. Apply minimally effective or							

	ineffective lab skills and techniques. Misuse of data and results and/or unable to draw appropriate conclusions.	
Textbooks	D. A. McQuarrie: Quantum Chemistry (2nd Edition, 2007) I N. Levin: Quantum Chemistry (5th Edition, 2008)	

CHEM2509 Principle	es of chem	ical biology (6 credits)	Academic Year	2012				
Offering Department	Chemistry		Quota	50				
Course Co-ordinator	Dr X C Li,	Chemistry						
Course Aim	generate r	tand how to use chemical approaches to emulate biological shew functional molecules. Useful as an introduction to research and biotechnology.						
Course Contents	application	n of chemical and combinatorial approaches, Chemical ns. The contents include Chemical Biology of Nucleic acids, I s as well as the generation of new functional molecules.						
Learning Outcomes	- Give example - Demonstrand biotec	On successful completion of this course, students should be able to: - Give examples of how to use chemical methods to produce new molecules with biological functions. - Demonstrate understanding of the connections between chemistry and biology associated with drug discovery and biotechnologies. - Compare chemical biology and traditional biology approaches in drug discovery						
Pre-requisites	Pass in CH	HEM1003 or CHEM1401 or CHEM1406 or BIOC1001						
Offer in 2012 - 2013	2nd sem		Examination	May				
Offer in 2013 - 2014	Y							
Teaching Hours	24 hours le	ectures and 12 tutorials						
Assessment Method	One 3-hou	r written examination (60% weighting) and course work assessm	nent (40% weighting)					
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. Insightful use and critical analysis / evaluation of information drawn from a full range of high quality sources and to quote/reference aptly.							
	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. Critical use of relevant information from sources, showing ability to make meaningful comparisons between different secondary interpretations and to quote/reference aptly.							
	С	Demonstrate general but incomplete command of knowledge and skills re- outcomes. Show evidence of some analytical and critical abilities and logical familiar situations. Apply moderately effective organizational and present sources, showing ability to make comparisons between different interpretation	thinking, and ability to app ational skills. Use of relev	ly knowledge to most ant information from				
	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills. Use and reference of several sources, but mainly through summary rather than analysis and comparison.							
	Fail Demonstrate little or no evidence of 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. Limited use of secondary sources and no critical comparison of them.							
Textbooks	Andrew M	/ /iller and Julian Tanner: Essentials of chemical biology: s equies	structure and dynam	ics of biologica				

CHEM2510 Principle techniques (6 credit	es and applications of spectroscopic and analytical s)	Academic Year	2012			
Offering Department	Chemistry Quota 120					
Course Co-ordinator	Dr X Li, Chemistry					
Course Aim	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	UV-Visible Absorption Spectroscopy, Nuclear Magnetic Resonance Spectroscopy, Mass Spectrometry, Infra-red Spectroscopy, Elemental Analysis, Molecular Formulas and analysis of data.					
Learning Outcomes	On successful completion of this course, students should be able to: - Understand the basic principles and applications of IR, UV/Vis, MS and NMR spectroscopic techniques. - Describe and explain the terminology of IR, UV/Vis, MS and NMR spectroscopies. - Perform chemical structure elucidation and analysis based on UV/Vis, MS and NMR spectroscopic data					
Pre-requisites	Pass in any CHEM1XXX level course; and Not for students who have already passed CHEM2507 before.					
Offer in 2012 - 2013	2nd sem	Examination	Мау			
Offer in 2013 - 2014	Y					
Teaching Hours	24 hours of lectures and 12 hours of tutorials					
Assessment Method	One 3-hour written examination (70%), course work assessment (15%) and two guizzes (15%)					

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.			
	в	Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations.			
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations.			
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems.			
	Fail	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.			
Textbooks	Donald L. Pavia, Gary M. Lampman, George S. Kriz: Introduction to Spectroscopy (Thomson Learning, 20 and 4th editions.)				
Remarks	Suggest	Suggested follow-up course: CHEM2202			

CHEM3105 Chemist	ry project	t (12 c	redits)			Academic Year	2012
Offering Department	Chemistry					Quota	
Course Co-ordinator	Prof D L I	. Phillips	, Chemistry				
Course Aim				search techniques by we would prepare students			t supervision of a
Course Contents	A short re	research	n project provid	ded by a member of staf	f (e.g. the students sup	ervisor).	
Learning Outcomes	- Underst - Demons chemical - Demons	On successful completion of this course, students should be able to: - Understand the terminology and nomenclature associated with their own research chemistry project - Demonstrate knowledge and understanding of the chemical techniques they used to do the research in their own chemical project - Demonstrate knowledge and understanding of the results of their own chemistry project and its context in the broader research area					
Pre-requisites	Pass in CHEM25		2202; and C	HEM2302 or CHEM23	03; and CHEM2402	or CHEM2403; an	d CHEM2503 o
Offer in 2012 - 2013	Year long	ıg				Examination	No Exam
Offer in 2013 - 2014	Y						
Teaching Hours	Laboratory time not less than 8 hours per week for 24 weeks or longer						
Assessment Method		A thesis of about 3,000 to 5,000 words (100% weighting) to be submitted at the end of the session. Students will be expected to give seminars on their work at the end of the course which will be assessed in conjunction with the thesis.					
Course Grade	A+ to F						
Grade Descriptors	A	of so quali integ prese	ome originality. Ill ity sources. Critic gration of a wide	omprehension of the research   luminating utilization and critic cal employment of data and re range of appropriate theories [Work of A+ should demonsi	al analysis / evaluation of in sults to synthesize appropria , principles, data and metho	formation acquired from ate and illuminating cond ods. Employ very effecti	a wide range of high clusions. Demonstrate ve organizational and
	В	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.					
	С	use Main	of relevant information of correct but so	ncomplete comprehension of t mation from sources. Demon- me incorrect utilization of data s, principles, data and methods	strate ability to compose co a and results to form appro	omparisons between dif priate conclusions. Dem	ferent interpretations. onstrate some partia
	<ul> <li>Show a partial but limited comprehension, with knowledge of some relevant information, of the research prisome coherent and logical thinking, but with limited analytical and critical abilities. Show utilization and resources, but mostly via summary instead of by analysis and comparison. Limited ability to employ data a appropriate conclusions. Demonstrate limited integration of theories, principles, data and methods. Financial y effective organizational and presentational skills.</li> </ul>						reference of severa a and results to form
	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.						
	Specialist texts depend on the selected topic.						
Textbooks	Second year students with exceptional academic achievement may also apply for this course						

CHEM3106 Symmetry	y, group theory and applications (6 credits)	Academic Year	2012
Offering Department	Chemistry	Quota	60
Course Co-ordinator	Prof V W W Yam, Chemistry		

## Department of Chemistry

Course Aim	To introduce the concepts of symmetry and group theory and to apply them in solving chemical problems. This course also provides an introductory treatment of bonding theories, inorganic electronic and vibrational spectroscopy. This course is essential for students who wish to take advanced courses in inorganic chemistry and all types of spectroscopy.					
Course Contents	character i molecular o	elements and symmetry operations; symmetry point groups; reducib tables; direct products; symmetry-adapted linear combinations; pro orbital theory for organic, inorganic and organometallic systems; sele spectroscopy.	jection operators	; hybrid orbitals;		
Learning Outcomes	<ul> <li>On successful completion of this course, students should be able to:</li> <li>Understand the basic principles and concepts of symmetry and group theory and to apply them in solving chemical problems</li> <li>Demonstrate knowledge and understanding in the use of character tables and projection operator techniques</li> <li>Demonstrate knowledge and understanding of bonding theories involving hybrid orbitals and molecular orbitals for organic, inorganic and organometallic systems</li> <li>Demonstrate knowledge and understanding in the application of symmetry and group theory in electronic and vibrational spectroscopy</li> </ul>					
Pre-requisites	Pass in CH	IEM2303				
Offer in 2012 - 2013	1st sem		Examination	Dec		
Offer in 2013 - 2014	Y					
Teaching Hours	36 lectures	and tutorials				
Assessment Method	One 3-hou	r written examination (75% weighting) and continuous assessment (2	5% weighting)			
Course Grade	A+ to F					
	A B	and group theory and their applications in solving chemical problems, especially symmetry operations; symmetry point groups; reducible and irreducible represent symmetry-adapted linear combinations; projection operators; treatment of bondir molecular orbitals for organic, inorganic and orgametallic systems; and applications Show strong ability to apply and integrate knowledge and theory relating to the basic group theory and their applications in bonding, and electronic and vibrational spen novel problems and critical use of data and experimental results to draw appropriate principles and applications of symmetry and group theory. Demonstrate substantial command of knowledge and understanding of essential relating to symmetry and group theory and their applications in solving chemic symmetry elements and symmetry operations; symmetry point groups; reducible a tables; direct products; symmetry-adapted linear combinations; projection operators hybrid orbitals and molecular orbitals for organic, inorganic and orgametallic sys vibrational spectroscopy. Show evidence to apply and integrate knowledge and the evidence to analyze novel problems and correct use of data and experimental result to the principles and applications of symmetry and group theory.	tations; character tab g theories including in electronic and vibre c principles and conce ctroscopy. Show stror e and insightful conclu- facts, concepts, prin al problems, especia and irreducible repres s; treatment of bondin stems; and application heory relating to the itronic and vibrational ts to draw appropriate	les; direct products; hybrid orbitals and ational spectroscopy. pts of symmetry and ng ability to analyze usions relating to the ciples, and theories lly those related to thentations; character g theories including is in electronic and basic principles and spectroscopy. Show conclusions relating		
	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 knowledge and understanding of essential facts, concepts, principles, and theor relating to symmetry and group theory and their applications in solving chemical problems, especially those related symmetry elements and symmetry operations; symmetry point groups; reducible and irreducible representations; charac tables; direct products; symmetry-adapted linear combinations; projection operators; treatment of bonding theories includ hybrid orbitals and molecular orbitals for organic, inorganic and orgametallic systems; and applications in electronic a vibrational spectroscopy. Show evidence of limited abilities to apply and integrate knowledge and theory relating to the be principles and concepts of symmetry and group theory and their applications in bonding, and electronic and vibratio spectroscopy. Show limited ability to analyze problems to most familiar situations and mostly correct but erroneous use of d and experimental results to draw appropriate conclusions relating to the principles and applications of symmetry and group theory.				
	Fail	Demonstrate little or no evidence of command of knowledge and understanding of theories relating to symmetry and group theory and their applications in solving cher symmetry elements and symmetry-operations; symmetry point groups; reducible a tables; direct products; symmetry-adapted linear combinations; projection operators hybrid orbitals and molecular orbitals for organic, inorganic and orgametallic sys vibrational spectroscopy. Show little or no evidence of abilities to apply and integr basic principles and concepts of symmetry and group theory and their applications spectroscopy. Show little or no ability to analyze problems to most familiar site experimental results to draw appropriate conclusions relating to the principles and app	mical problems, espec and irreducible repres s; treatment of bondir stems; and applicatior rate knowledge and th in bonding, and elect uations and erroneou	cially those related to sentations; character of theories including is in electronic and heory relating to the ronic and vibrational us use of data and		

CHEM3107 Interfacial science and technology (6 credits) Academic Year 2012			2012		
Offering Department	Chemistry Quota 50				
Course Co-ordinator	Prof K Y Chan, Chemistry				
Course Aim	To understand the science and technology of interfacial phenomena and processes often appeared in high value added products and modern technologies.				
Course Contents	Physics and Chemistry of Interfaces: coatings and surfactants, colloids and interfaces, wetting, microemulsion, thin films, nanomaterials, porous materials.				
Learning Outcomes	On successful completion of this course, students should be able to: - Understand interfacial phenomena and their origin from molecular details. - Solve problems in interfacial science and technology by applying thermodynamics, and kinetics.	knowledge of ger	neral chemistry,		

				nologies that re , composite polyn			l science, includir	ng nanomaterials,
Pre-requisites	Pass in	Pass in CHEM2503 or CHEM2504						
Offer in 2012 - 2013	2nd sem	2nd sem Examination May						
Offer in 2013 - 2014	Y							1
Teaching Hours	24 lectu	ures ar	and 12 tutorials					
Assessment Method	One 2-h	hour w	written examinati	ion (70% weightir	ng) and continuou	us assessment	(30% weighting)	
Course Grade	A+ to F							
Grade Descriptors	A	ci a	Demonstrate thorough knowledge of interfacial science and technology, and mastery of skills required for attaining all of the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to solve problems in a wide range of complex, familiar and unfamiliar situations. Critical use of data and sourcing of references. Apply highly effective organizational and presentational skills.					
	В	rr ki	Demonstrate substantial knowledge of interfacial science and technology and command of skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to solve problems in familiar and some unfamiliar situations. Correct use of data and sourcing of references. Apply effective organizational and presentational skills.					
	С	C Demonstrate general but incomplete knowledge of interfacial science and technology and command of skills required attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, ability to apply knowledge solve problems to most familiar situations. Mostly correct but some erroneous use of data references. Apply moderately effective organizational and presentational skills.					nd logical thinking, and	
	D	Demonstrate partial but limited knowledge of interfacial science and technology and command of skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Limited ability to use data and source references. Apply limited or barely effective organizational and presentational skills.						
	Fail	a n	attaining the course	learning outcomes. L mowledge to solve p	ack of analytical and	critical abilities, log	nnology, and command gical and coherent think s. Organization and pr	ting. Show very little or
Textbooks	Barnes a		minimally effective o Gentle: Interfacia					

CHEM3110 Advance	ed material	s (6 credits)		Academic Year	2012		
Offering Department	Chemistry			Quota	50		
Course Co-ordinator	Prof W K C	Prof W K Chan, Chemistry					
Course Aim	on materia	e is a continuation from Introdution to Materials als chemistry and application of materials in ad themistry will also be discussed.					
Course Contents	control of s high stren	Advanced polymerization methods: copolymerization and applications of copolymers, coordination polymerization control of stereochemistry in polymers; ionic and radical living polymerization. Materials for specialty applications high strength materials; high temperature polymers, polyelectrolytes, conducting polymers, optical information storage, sensors, photonics, electronics, nanotechnology. Advanced materials characterization techniques.					
Learning Outcomes	<ul> <li>describe</li> <li>polymeriza</li> <li>identify e</li> <li>their prope</li> <li>demonstr</li> </ul>	sful completion of this course, students should be the mechanisms and kinetics of copolyme tions; examples of some engineering polymers for high rties affected by the molecular structures; ate knowledge in advanced materials characteriz and the working principles of materials for informat	erizations, coordina n temperature/high s ation techniques;	strength application	ons, and how ar		
Pre-requisites	Pass in CH	IEM2109					
Offer in 2012 - 2013	2nd sem		1	Examination	May		
Offer in 2013 - 2014	Y						
Teaching Hours	36 hours le	ecture/tutorial					
Assessment Method	One 3-hou	r written examination (85%), continuous assessm	nent (15%)				
Course Grade	A+ to F						
Grade Descriptors	A	Demonstrate thorough knowledge and understanding of e approach in polymer synthesis, properties, application, and ability to apply and integrate knowledge and theory relati strong ability to analyze novel problems and critical use o conclusions relating to advanced materials synthesis and ti	I characterization of mate ing to the synthesis and of data and experimental	rials for advanced tech applications of advan	nology. Show stron ced materials. Show		
	nderstanding of essential erties, application, and c lge and theory relating to d correct use of data and heir properties.	haracterization of ma the synthesis and app	terials for advance lications of advance				
	C Demonstrate general but incomplete command of knowledge and understanding of essential facts, concepts, principles, and theories relating to frontier approach in polymer synthesis, properties, application, and characterization of materials for advanced technology. Show evidence of some abilities to apply and integrate knowledge and theory relating to the synthesis and applications of advanced 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 advanced materials synthesis and their properties.						
	D	Demonstrate partial but limited command of knowledge and relating to frontier approach in polymer synthesis, prope technology. Show evidence of limited abilities to apply a applications of advanced materials. Show limited ability to erroneous use of data and experimental results to draw ap	erties, application, and c and integrate knowledge analyze problems to mo	haracterization of ma and theory relating t st familiar situations a	terials for advance o the synthesis an nd mostly correct b		

		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.
Textbooks		Principles of Polymerizations (John Wiley and Sons, 2004) cialist references will be given throughout the course.

CHEM3204 Modern		insuur	mentation and a	plications	(o creaits)		Academic Year	2012	
Offering Department	Chemistry	ry					Quota	50	
Course Co-ordinator	Dr I K Chu	nu, Cherr	nistry						
Course Aim	principles	s and pra	course is to provide actical aspects of in degree or a career in	strument des	ign. The course				
Course Contents	Metabolon Laser Spe frequency noise enha Atomic PL spectrome detectors; Atomic X-I X-ray fluor	omics. Dectrosco vy conve hanceme Plasma Plasma s; interfel (-ray Spe orescence	s spectrometry: Li opy: Principle of las ersion); laser-induce ent by boxcar integra Spectrometry: Induc (P-MS); signal-produ- rences in ICP-AES a ectrometry: x-ray flu ce spectrometers c Resonance Spectr	er; three-leve d fluorescenn ation and pho ctively couple uction proces and ICP-MS. orescence; w	el and four-level be; laser atomic ton counting. e plasma-atomic ses in ICP spec avelength-disper	lasers; las spectrome emission ctrometry; sive (WDX	er instrumentation etry; laser remote spectrometry (ICP Echelle grating sp	(Q-switching ar sensing; signal- -AES) and mas ectrometer; arra	
Learning Outcomes	<ul> <li>Explain t quantificat</li> <li>Explain</li> <li>experimen</li> <li>Use the o</li> <li>Apply LC</li> <li>Explain tl</li> <li>Describe</li> </ul>	<ul> <li>On successful completion of this course, students should be able to:</li> <li>Explain the principles of the modern mass spectrometric methods for proteins and metabolites identification and quantification;</li> <li>Explain how proteins are identified and sequenced experimentally and how data is generated in proteomics experiments;</li> <li>Use the database searching techniques and software tools to analyze high-throughput proteomics data;</li> <li>Apply LC/MS/MS method for target quantitative analysis of small molecules.</li> <li>Explain the principles of the laser spectroscopy, atomic plasma spectrometry, and atomic x-ray spectrometry.</li> <li>Describe the basic experimental set up and the properties of the basic components of the instruments used in the laboratory classes.</li> </ul>							
Pre-requisites	Pass in Cl	CHEM22	202						
Offer in 2012 - 2013	1st sem						Examination	Dec	
Offer in 2013 - 2014	Y						1		
Teaching Hours	24 lectures	es, 12 tu	utorials, and 4 x 4-ho	ur laboratory	sessions				
Assessment Method	One 2-hou tests (25%		en examination (75% nting)	5 weighting) a	nd course work	assessmer	t which includes la	boratory work ar	
Course Grade	A+ to F								
Grade Descriptors	A	mode	onstrate thorough knowle arn chemical instrumenta g ability to analyze proble	tions and applic	ations. Show strong	ability to app	ly and integrate knowle	edge and theory, an	
	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	Demonstrate general but incomplete command of knowledge and understanding of essential facts, concepts, principles and theories relating to the modern chemical instrumentations and applications. Show evidence of some abilities to apply and integrate knowledge and theory, and to analyze problems to most familiar situations to fundamental principles and practical aspects of instrument design.							
	D	D Demonstrate partial but limited command of knowledge and understanding of essential facts, concepts, principles and theories relating to the modern chemical instrumentations and applications. Show evidence of limited abilities to apply and integrate knowledge and theory, and limited ability to analyze problems to most familiar situations related to fundamental principles and practical aspects of instrument design.							
Fail Demonstrate little or no evidence of command of knowledge and understanding of essential facts, concepts theories relating to the modern chemical instrumentations and applications. Show little or no evidence of abilitintegrate knowledge and theory, and little or no ability to analyze problems to most familiar situations related						f abilities to apply an			
	Fail			principles and practical aspects of instrument design. Chhabil Dass: Fundamentals of contemporary mass spectrometry (Wiley-Interscience)					
Textbooks	Chhabil Da	princij Dass: Fu	iples and practical aspect	s of instrument d	esign. ss spectrometry (			n)	

CHEM3206 Analytica	Academic Year	2012	
Offering Department	Chemistry	Quota	100
Course Co-ordinator	Dr Y S Fung, Chemistry		
Course Aim	The aim of the course is focus on the basic principle, practice and methods	nodology in chemica	al analysis and

	associated	associated application for determining analytes in gas, liquid and solid samples.					
Course Contents	Principles and Methodologies: Analytical information; Errors and uncertainties; Chemometrics; Statistical hypothesis testing in chemical analysis; Assessing performance of analytical methods and procedures. Reliability in chemical measurement: Quality assurance in chemical analysis; Good laboratory practice; Hong Kong Laboratory Accreditation Scheme (HOKLAS); Validation and comparability of chemical measurement. Application of chemical analysis for gas, liquid and solid samples.						
Learning Outcomes	<ul> <li>find inform</li> <li>assess an</li> <li>apply Che</li> <li>carry out o</li> <li>select suit</li> <li>understand</li> </ul>	sful completion of this course, students should be able to: nation from analytical literature nalytical methodology for its scope in application emometric methods to assess data quality, validate results and int chemical and instrumental analysis for a given task table analytical method to solve problems in gas, liquid and solid issues and limitations of chemical analysis analytical knowledge		nce			
Pre-requisites	Pass in CH	1EM2202 or CHEM2207					
Offer in 2012 - 2013	2nd sem		Examination	May			
Offer in 2013 - 2014	Y						
Teaching Hours	24 lectures	24 lectures, 6 tutorials and 6 x 4 hours of practicals					
Assessment Method	One 3-hour	r written examination (75% weighting). Continuous assessment (2	25%)				
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, logical thinking and capability to apply knowledge learnt to solve a wide range of complex issues and problems related to chemical analysis. 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 chemical analysis. 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 chemical analysis. 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 chemical analysis. Apply limited or barely effective organization and presentation skill as shown in class work.						
	Fail	Demonstrate little or no evidence for the command of knowledge and skills requ Lack of analytical and critical abilities, logical and coherent thinking. Show ver problems related to chemical analysis. Organization and presentation skills are class work.	y little or no ability to app	ly knowledge to solve			
Textbooks	D.A Skoog latest editio	, D.M. West, and F.J. Holler: Fundamentals of Analytical Chen ח).	nistry (Brook/Cole T	homson Learning,			
References	Peferences	s to specialist texts and other published materials will be made thr	oughout the course				

CHEM3304 Organor	netallic chemistry (6 credits)	Academic Year	2012
Offering Department	Chemistry	Quota	40
Course Co-ordinator	Prof V W W Yam, Chemistry		
Course Aim	To give further, more detailed, treatment to organometallic che Chemistry. The course also aims to introduce and familiarize stude to prepare students for graduate work in inorganic and organometal	ents with advanced laborator	
Course Contents	Lectures: Main group and transition metal organometallics. Transiti and reactivities of organometallics. Application of organometallics in Laboratory: To introduce and familiarize students with advanced lab and manipulation of air- and moisture- sensitive compounds, and t methods.	n organic synthesis and cataly poratory techniques which inc	vsis.
Learning Outcomes	On successful completion of this course, students should be able to: - Understand the advanced principles and concepts in organometalli - Demonstrate knowledge and understanding in the bonding, s transition metal organometallics, especially in transition metal clust alkylidynes - Demonstrate knowledge and understanding in the application polymerization and catalysis - Demonstrate ability in advanced laboratory techniques including moisture- sensitive compounds, and their characterization by various	ic chemistry tructure and reactivities of iers, metal alkyls, metal alky in of organometallics in or g the synthesis and manipu	idenes and me
Pre-requisites	Pass in CHEM2303		
Offer in 2012 - 2013	1st sem	Examination	Dec
Offer in 2013 - 2014	Y		
Teaching Hours	24 lectures + 5 tutorials and 6 x 5-hour laboratory sessions		
Assessment Method	One 3-hour written examination (75% weighting) and continuous weighting)	s assessment including pra	ctical work (25

Course Grade	A+ to F
Grade Descriptors	A Demonstrate thorough knowledge and understanding of essential facts, concepts, principles, and theories relating to the more detailed and advanced treatment of organometallic chemistry, especially those related to structure, bonding and reactivities of main group and transition metal organometallics; transition metal cluster chemistry; and application of organometallics in organic synthesis and catalysis. Show strong ability to apply and integrate knowledge and theory relating to the advanced principles and concepts of organometallic chemistry. Show strong ability to analyze novel problems and critical use of data and experimental results to draw appropriate and insightful conclusions relating to the advanced principles and applications of organometallic bilderivie advanced laboratory skills and techniques, especially in the synthesis and manipulation of air- and moisture- sensitive compounds and their characterization by various spectroscopic methods.
	B Demonstrate substantial command of knowledge and understanding of essential facts, concepts, principles, and theories relating to the more detailed and advanced treatment of organometallic chemistry, especially those related to structure, bonding and reactivities of main group and transition metal organometallics; transition metal cluster chemistry; and application of organometallics in organic synthesis and catalysis. Show evidence to apply and integrate knowledge and theory relating to the advanced principles and concepts of organometallic chemistry. Show evidence to analyze novel problems and correct use of data and experimental results to draw appropriate conclusions relating to the advanced principles and applications of organometallic chemistry. Bomonstrate effective advanced laboratory skills and techniques, especially in the synthesis and manipulation of air- and moisture- sensitive compounds and their characterization by various spectroscopic methods.
	C Demonstrate general but incomplete command of knowledge and understanding of essential facts, concepts, principles, and theories relating to the more detailed and advanced treatment of organometallic chemistry, especially those related to structure, bonding and reactivities of main group and transition metal organometallics; transition metal cluster chemistry; and application of organometallics in organic synthesis and catalysis. Show evidence of some abilities to apply and integrate knowledge and theory relating to the advanced principles and concepts of organometallic 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 advanced principles and applications of organometallic chemistry. Demonstrate moderately effective advanced laboratory skills and techniques, especially in the synthesis and manipulation of air- and moisture- sensitive compounds and their characterization by various spectroscopic methods.
	Demonstrate partial but limited command of knowledge and understanding of essential facts, concepts, principles, and theories relating to the more detailed and advanced treatment of organometallic chemistry, especially those related to structure, bonding and reactivities of main group and transition metal organometallics; transition metal cluster chemistry; and application of organometallics; transition metal caply and integrate knowledge and theory relating to the advanced principles and catalysis. Show evidence of limited abilities to apply and integrate knowledge and theory relating to the advanced principles and concepts of organometallic chemistry. Show limited ability to analyze problems to most familiar situations and mostly correct but erroneous use of data and experimental results to draw appropriate conclusions relating to the advanced principles and applications of organometallic chemistry. Demonstrate partially effective advanced laboratory skills and techniques, especially in the synthesis and manipulation of air- and moisture- sensitive compounds and their characterization by various spectroscopic methods.
	<ul> <li>Demonstrate little or no evidence of command of knowledge and understanding of essential facts, concepts, principles, and theories relating to the more detailed and advanced treatment of organometallic chemistry, especially those related to structure, bonding and reactivities of main group and transition metal organometallics; transition metal cluster chemistry; and application of organometallics in organics in organic synthesis and catalysis. Show little or no evidence of abilities to apply and integrate knowledge and theory relating to the advanced principles and concepts of organometallic chemistry. Show little or no ability to analyze problems to most familiar situations and erroneous use of data and experimental results to draw appropriate conclusions relating to the advanced principles and applications of organometallic chemistry. Demonstrate minimally effective advanced laboratory skills and techniques, especially in the synthesis and manipulation of air- and moisture- sensitive compounds and their characterization by various spectroscopic methods.</li> </ul>
Textbooks	R. H. Crabtree: The Organometallic Chemistry of the Transition Metals (Wiley, 2005, 4th ed.) C. Elschenbroich and A. Salzer: Organometallics - A Concise Introduction (VCH, 1992, 2nd revised edition)
References	Reference to specialist texts and other published materials will be made throughout the course.

CHEWISSUS AUVANCE	d Inorganio	c Chemistry (6 credits)	Academic Year	2012		
Offering Department	Chemistry		Quota	40		
Course Co-ordinator	Prof C M C	he, Chemistry				
Course Aim	topics in In	e is a continuation from Intermediate Inorganic Chemistry, giving organic Chemistry and new areas of interest. Problem based le ed in the later part of the course. This course also aims to prepar	arning on selected a	dvance topics wil		
Course Contents	bonds, inor	Selected advanced topics of current interest. Examples include metal-metal bonds and metal-ligand multiple bonds, inorganic and supramolecular photochemistry, lanthanide chemistry, bio-inorganic and medicinal chemistry and activation of small molecules by metal complexes.				
Learning Outcomes	<ul> <li>Understar</li> <li>complexes</li> <li>Understar</li> <li>Understa</li> <li>importance</li> <li>Introduction</li> <li>catalysis ar</li> </ul>	sful completion of this course, students should be able to: nd the electronic structure and bondings of novel metal-metal a nd the principles and concepts of inorganic and supramolecular p nd and realize the activation of small molecules by transition of such activation in chemical catalysis of global interest, green of on to the chemistry of lanthanide coordination compounds and nd biomedical sciences.	hotochemistry. on metal complexes chemistry and energy their applications in	and realize the saving reactions.		
Pre-requisites	Pass in CH	EM2302 or CHEM2303; and EM3106, or already enrolled in this course; and lents who have passed in CHEM3303 before.				
Offer in 2012 - 2013	1st sem		Examination	Dec		
Offer in 2013 - 2014	Y					
Teaching Hours	36 lectures	, 6 tutorials and 6 hours of literature survey and presentation				
Assessment Method	One 3-hour	written examination (80% weighting). Continuous assessment (2	20%)			
	A+ to F					
Course Grade	711 10 1					
Course Grade Grade Descriptors	A	Demonstrate thorough knowledge and understanding of essential facts, con frontiers in inorganic chemistry. Show strong ability to apply and integrate know novel problems in inorganic chemistry. Apply highly effective organizational and	wledge and theory, and st			

	с	Demonstrate general but incomplete command of knowledge and understanding of essential facts, concepts, principles and theories relating to the more advanced knowledge in inorganic chemistry. Show evidence of some abilities to apply and integrate knowledge and theory, and to analyze problems to most familiar situations in inorganic chemistry. Apply moderately effective organizational and presentational skills.
	D	Demonstrate partial but limited command of knowledge and understanding of essential facts, concepts, principles and theories relating to the more advanced knowledge in inorganic chemistry. Show evidence of limited abilities to apply and integrate knowledge and theory, and limited ability to analyze problems to most familiar situations in inorganic chemistry. Demonstrate partially effective organizational and presentational skills.
	Fail	Demonstrate little or no evidence of command of knowledge and understanding of essential facts, concepts, principles and theories relating to the more advanced knowledge in inorganic chemistry. 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 in inorganic chemistry. Demonstrate minimally effective organizational and presentational skills.
Textbooks	F.A. Cottor	n, G. Wilkinson, Hurillo and Bochmann: Advance Inorganic Chemistry (Wiley, 1999, 6th ed.)
References	Reference	s to specialist texts and other published materials will be made throughout the course.

CHEM3404 Advance	ed organic	chemistry (6 credits)	Academic Year	2012			
Offering Department	Chemistry	Chemistry Quota 50					
Course Co-ordinator	Prof D Yan	Prof D Yang, Chemistry					
Course Aim		Fo provide students with knowledge in organic chemistry reaction mechanisms and organic compound structure determination.					
Course Contents		e covers chemical bonding, advanced stereochemistry, configereaction mechanisms, reactive intermediates, rearrangement re					
Learning Outcomes	<ul> <li>Describe,</li> <li>Identify at</li> <li>Describe</li> <li>Have a g carbenes at</li> <li>Suggest r</li> </ul>	On successful completion of this course, students should be able to: Describe, analyze and interpret the structure and reactivity relationship of organic molecules Identify and predict the selectivities (chemoselectivity, regioselectivity and stereoselectivity) in organic reactions Describe the general approaches to study organic mechanisms Have a general understanding and working knowledge of pericyclic reactions, reactive intermediates (radicals, arbenes and nitrenes), and polar rearrangements Suggest reasonable mechanistic pathways for some types of organic reactions Apply the knowledge of reaction mechanisms in design of synthetic routes for organic compounds					
Pre-requisites	Pass in CH	IEM2402 or CHEM2403					
Offer in 2012 - 2013	1st sem		Examination	Dec			
Offer in 2013 - 2014	Y						
Teaching Hours	24 lectures	and 12 tutorials					
Assessment Method	One 3-hou	r written examination (70% weighting) and coursework (30% weigh	nting)				
Course Grade	A+ to F						
Grade Descriptors	A	Demonstrate thorough mastery at an advanced level of extensive knowledge learning outcomes. Show strong analytical and critical abilities and logical thinkir to apply knowledge to a wide range of complex, familiar and unfamiliar situations	ig, with evidence of origin				
	В	Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations.					
	С	Demonstrate general but incomplete command of knowledge and skills requi outcomes. Show evidence of some analytical and critical abilities and logical th familiar situations.					
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited apply knowledge to solve problems.					
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course leat Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply kn problems.						
Textbooks	2007. J. McMurry S. McMurr 2012.	and R.J. Sunberg, "Advanced Organic Chemistry, Part A: Structur, ", "Organic Chemistry" 8th Ed., Thomson Brooks/Cole, 2012. y, "Study Guide and Student Solutions Manual for Organic Chem "Pericyclic Reactions" Oxford University Press, 1999.					

CHEM3405 Organic	HEM3405 Organic chemistry of life (6 credits)						
Offering Department	Chemistry Quota 50						
Course Co-ordinator	Dr P H Toy, Chemistry	Dr P H Toy, Chemistry					
Course Aim	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	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.						
Learning Outcomes	<ul> <li>On successful completion of this course, students should be able to:</li> <li>- have a basic understanding of biologically important organic molecules</li> <li>- have a basic understanding of enzyme catalysis</li> <li>- appreciate how organic chemistry plays an important role in biology and biochemistry</li> </ul>						
	228						

Pre-requisites	Pass in C	Pass in CHEM1401 or CHEM1406 or CHEM2402 or CHEM2403						
Offer in 2012 - 2013	1st sem	eem Examination Dec						
Offer in 2013 - 2014	Y							
Teaching Hours	24 lecture	s and 12 tutorials						
Assessment Method	One 2-ho	ur written examination (60%), 2 mid-term tests (30%) a	nd an oral presentation (10%)					
Course Grade	A+ to F							
Grade Descriptors	A	Demonstrate thorough mastery at an advanced level of extensive biomolecule organic chemistry knowledge, and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar problems. Apply highly effective organizational and presentational skills.						
	В	Demonstrate substantial command of biomolecule organic chemistry with a broad range of knowledge, and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar problems. Apply effective organizational and presentational skills.						
	С	Demonstrate general but incomplete command of biomolecule organic chemistry knowledge, and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar problems. Apply moderately effective organizational and presentational skills.						
	D	Demonstrate partial but limited command of biomolecule organic chemistry knowledge, and skills required for attaining some the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critic abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational an presentational skills.						
	Fail	Demonstrate little or no evidence of command of biomolecule or course learning outcomes. Lack of analytical and critical abilities apply knowledge to solve problems. Organization and presentation	s, logical and coherent thinking. Show ve	ery little or no ability to				
Textbooks	Bruice, P.	Y.; Organic Chemistry (Pearson, 2007, 5th edition), ch	napters 21-27					

CHEM3406 Integrate	ed Organic	c Synthesis (	6 credits)			Academic Year	2012	
Offering Department	Chemistry	y				Quota		
Course Co-ordinator	Prof P Chi	Prof P Chiu, Chemistry						
Course Aim	products, o in advance	To introduce aspects of modern organic reactions with relevance to and in the context of the synthesis of natural products, drugs and medicinal chemistry to provide an integrated approach to the subject, and to provide training n advanced organic laboratory skills, and further hands-on experience in synthesis and characterization, as preparation for graduate studies or research in organic chemistry.						
Course Contents	present m drug molec these mole their mech retrosynthe	Building on the organic chemistry covered in the foundational courses CHEM1003 and CHEM2402, this course will present modern synthetic methods and synthetic planning. The course is organized into units based on target drug molecules. In each unit, the chemical biology of these compounds are briefly presented and the syntheses of hese molecules are introduced, accompanied by in-depth discussions of the reactions involved with emphasis on heir mechanisms, selectivity, stereochemistry, scope and limitations. Concept of synthetic design including etrosynthetic analysis, stereoselectivity and enantioselective control elements will be emphasized. A laboratory section provides training in the practical skills of synthesis.						
Learning Outcomes	<ul> <li>Understa</li> <li>Apply the</li> <li>Know sort</li> </ul>	and the condition the knowledge of the strategies of	ons, selectivities, organic reaction of enantioselectiv	ns toward solving p ve control	everal classes of im	is and synthetic des	sign	
Pre-requisites		Pass in CHEM2402 or CHEM2403; and Not for students who have passed in CHEM3403 before.						
Offer in 2012 - 2013	2nd sem					Examination	May	
Offer in 2013 - 2014	Y							
Teaching Hours	24 lectures	es and 5 x 5 hou	urs of laboratory					
Assessment Method	One 3-hou	ur written exam	ination (70% wei	ighting), continuou	s assessment and	laboratory (30%)		
Course Grade	A+ to F							
Grade Descriptors	A Demonstrate a thorough mastery at an advanced level of knowledge and understanding of concepts, principles, reactions and mechanisms related to synthetic organic chemistry. Show a strong ability to integrate knowledge and theory, and a strong ability to analyze novel synthetic organic chemistry situations and problems. Show a critical use of knowledge and data to apply to the solution of novel and complex synthetic problems. Demonstrate highly effective organization and application of lab skills and techniques in synthetic experiments.							
	в	related to synth analyze synthe solution of som	netic organic chemist tic organic chemistr	try. Show evidence of a ry situations and proble amiliar synthetic proble	ability to integrate know ems. Show a correct u	epts, principles, reaction ledge and theory, and e ise of knowledge and c ive organization and ap	evidence of ability to lata to apply to the	
	C Demonstrate a general but incomplete command of knowledge and understanding of concepts, principles, reactions and mechanisms related to synthetic organic chemistry. Show evidence of some ability to integrate knowledge and theory, and evidence of some ability to analyze synthetic organic chemistry situations and problems. Show a correct use of knowledge to apply to the solution of most familiar problems. Demonstrate moderately effective organization and application of lab skills and techniques in synthetic experiments.							
	Demonstrate a partial but limited command of knowledge and understanding of concepts, principles, reactions and mechanisms related to synthetic organic chemistry. Show evidence of a limited ability to integrate knowledge and theory, and a limited ability to analyze familiar situations and problems. Show some correct but erroneous use of knowledge to apply to the solution of most familiar problems. Demonstrate partially effective organization and application of lab skills and techniques in synthetic experiments.							
	Fail Demonstrate little or no evidence of command of knowledge and understanding of concepts, principles, reactions and mechanisms related to synthetic organic chemistry. Show little or no evidence of ability to integrate knowledge and theory in synthetic organic chemistry, and little or no ability to analyze most familiar situations and problems. Show mostly erroneous							

	use of knowledge to apply to the solution of familiar problems. Demonstrate minimally effective organization and application of lab skills and techniques in synthetic experiments.
References	Organic synthesis, C. Willis, M. Wills, Oxford Science Publications Top drugs, top synthetic routes, J. Saunders, Oxford Science Publications

CHEM3407 Medicina	ai chemistr		Academic Year	2012				
Offering Department	Chemistry	Chemistry Quota 140						
Course Co-ordinator	Prof H Z S	Prof H Z Sun, Chemistry						
Course Aim		e covers the chemical principles of drug design and drug action f bioorganic chemistry, bioinorganic chemistry, medicinal che ogy.						
Course Contents	computer-a - Drug-rece - 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 drug screening</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 interactions</li> </ul>						
Learning Outcomes	- Demonsti - Understa	sful completion of this course, students should be able to: rate knowledge of drug discovery, design and development nd drug-biomolecule interactions where appropriate ropriate knowledge of drug metabolism and drug delivery						
Pre-requisites	Pass in CH	IEM1003 or CHEM2402 or CHEM2403 or CHEM3405						
Offer in 2012 - 2013	2nd sem		Examination	Мау				
Offer in 2013 - 2014	Y							
Teaching Hours	24 lectures	s, 12 tutorials						
Assessment Method	One 3-hou	r written examination (75% weighting); Continuous assessment	of practical (25% weigh	nting)				
Course Grade	A+ to F							
Grade Descriptors	A	Demonstrate thorough knowledge and understanding of essential facts, conc foundation knowledge of medicinal chemistry, especially those related to targets; drug lead optimization; structure activity relationship; pharmacokin Show strong ability to apply and integrate knowledge and theory relating chemistry. Show strong ability to analyze novel problems and critical use of c and insightful conclusions relating to the basic principles and knowledge of r basic techniques for medicinal chemistry, especially in drug discovery and me	drug discovery, design and etics; drug delivery and its i to the basic foundation kno data and experimental results nedicinal chemistry. Demons	development; drug relevance to toxicity wledge of medicina s to draw appropriat				
	В	Demonstrate substantial command of knowledge and understanding of essential facts, concepts, principles, and theorie: relating to the basic foundation knowledge of medicinal chemistry; especially those related to drug discovery; design ann development; drug targets; drug lead optimization; structure activity relationship; pharmacokinetics; drug delivery and it relevance to toxicity. Show evidence to apply and integrate knowledge and theory relating to the basic foundation knowledge of medicinal chemistry. Show evidence to analyze novel problems and correct use of data and experimental results to drav appropriate conclusions relating to the basic principles and knowledge of medicinal chemistry. Demonstrate effective basi techniques for medicinal chemistry, especially in drug discovery and metabolism.						
	С	C Demonstrate general but incomplete command of knowledge and understanding of essential facts, concepts, principles, and theories relating to the basic foundation knowledge of medicinal chemistry; especially those related to drug discovery; design and development; drug targets; drug lead optimization; structure activity relationship; pharmacokinetics; drug delivery and its relevance to toxicity. Show evidence of some abilities to apply and integrate knowledge and theory relating to the basic foundation knowledge of medicinal chemistry. Show ability to analyze problems to most familiar situations and mostly correct but erroneous use of data and experimental results to draw appropriate conclusions relating to the basic principles and knowledge of medicinal chemistry. Demonstrate moderately effective basic techniques, basic techniques for medicinal chemistry.						
	Demonstrate partial but limited command of knowledge and understanding of essential facts, concepts, principles, and theori relating to the basic foundation knowledge of medicinal chemistry; especially those related to drug discovery; design and development; drug targets; drug lead optimization; structure activity relationship; pharmacokinetics; drug delivery and i relevance to toxicity. Show evidence of limited abilities to apply and integrate knowledge and theory relating studions in structure activity relationship; pharmacokinetics; drug delivery and i foundation knowledge of medicinal chemistry. Show limited ability to analyze problems to most familiar situations and most correct but erroneous use of data and experimental results to draw appropriate conclusions relating to the basic principles and knowledge of medicinal chemistry. Demonstrate partially effective basic techniques for medicinal chemistry, especially in drudiscovery and metabolism.							
	Fail	Demonstrate little or no evidence of command of knowledge and understan theories relating to the basic foundation knowledge of medicinal chemistry; e and development; drug targets; drug lead optimization; structure activity rela relevance to toxicity. Show little or no evidence of abilities to apply and inte foundation knowledge of medicinal chemistry. Show little or no ability to a erroneous use of data and experimental results to draw appropriate conclusio of medicinal chemistry. Demonstrate minimally effective basic techniques for and metabolism.	especially those related to dr titionship; pharmacokinetics; grate knowledge and theory nalyze problems to most fa ons relating to the basic princ	ug discovery; desig drug delivery and it relating to the basi miliar situations an ciples and knowledg				
Textbooks		uction to Medicinal Chemistry (3/e), G.L. Patrick, Oxford Univers Chemistry- An Introduction, G. Thomas, John Wiley, 2000	ity Press, 2005					

CHEM3410 Medicina	I chemistry for pharmacy students (6 credits)	Academic Year	2012					
Offering Department	Chemistry	Quota	30					
Course Co-ordinator	Prof H Z Sun, Chemistry	Prof H Z Sun, Chemistry						
Course Aim	This course presents the chemical principles of drug design and drug action, which is essential in the training for a pharmaceutical career. It builds on previous knowledge in organic chemistry and extends it to drug discovery,							
	220							

	•	d development. It also comprehensively discusses drug-biomole ry and important research techniques in the drug discovery process		drug metabolism,			
Course Contents	computer-a interactions	Drug discovery, design, and development: lead discovery, pharmacophore, structure-activity relationships (SAR), computer-aided drug design, combinatorial chemistry and high-throughput drug screening. Drug-receptor interactions. Proteins and enzymes as drug targets. Metalloenzymes: structures and functions. Metals in medicine. DNA-Drug interactions. Drug metabolism. Prodrugs and drug delivery.					
Learning Outcomes	- Demonstr - Understar	sful completion of the course, students should be able to: ate knowledge in the principles of drug discovery, design and devel nd the basic drug-biomolecule interactions ate knowledge of the principles in drug metabolism and drug delive	•				
Pre-requisites		n students only; and 1 or CHEM1411) and CHEM2410					
Offer in 2012 - 2013	2nd sem		Examination	Мау			
Offer in 2013 - 2014	Y						
Teaching Hours	32 lectures	, 3 hours presentations, and 3 hours laboratory demonstrations					
Assessment Method	One 3-hou	written examination (75% weighting) and course work assessment	(25% weighting)				
Course Grade	A+ to F						
Grade Descriptors	A	Demonstrate thorough knowledge and understanding of essential facts, concepts, foundation knowledge of medicinal chemistry, especially those related to drug targets; drug lead optimization; structure activity relationship; pharmacokinetics; Show strong ability to apply and integrate knowledge and theory relating to th chemistry. Show strong ability to analyze novel problems and critical use of data and and insightful conclusions relating to the basic principles and knowledge of medic basic techniques for medicinal chemistry, especially in drug discovery and metabo	discovery, design and drug delivery and its e basic foundation kno and experimental result cinal chemistry. Demons	d development; drug relevance to toxicity. wledge of medicinal s to draw appropriate			
	В	Demonstrate substantial command of knowledge and understanding of essenti relating to the basic foundation knowledge of medicinal chemistry: especially the development; drug targets; drug lead optimization; structure activity relationsh relevance to toxicity. Show evidence to apply and integrate knowledge and theory medicinal chemistry. Show evidence to analyze novel problems and correct us appropriate conclusions relating to the basic principles and knowledge of medic techniques for medicinal chemistry, especially in drug discovery and metabolism.	nose related to drug di ip; pharmacokinetics; d relating to the basic fou e of data and experime	scovery; design and lrug delivery and its ndation knowledge of ental results to draw			
	С	Demonstrate general but incomplete command of knowledge and understanding theories relating to the basic foundation knowledge of medicinal chemistry; espect and development; drug targets; drug lead optimization; structure activity relations relevance to toxicity. Show evidence of some abilities to apply and integrate I foundation knowledge of medicinal chemistry. Show ability to analyze problems t but erroneous use of data and experimental results to draw appropriate concl knowledge of medicinal chemistry. Demonstrate moderately effective basic to chemistry, especially in drug discovery and metabolism.	cially those related to driship; pharmacokinetics; knowledge and theory o most familiar situation lusions relating to the	ug discovery; design drug delivery and its relating to the basic is and mostly correct basic principles and			
	D	Demonstrate partial but limited command of knowledge and understanding of esser relating to the basic foundation knowledge of medicinal chemistry; especially the development; drug targets; drug lead optimization; structure activity relationsh relevance to toxicity. Show evidence of limited abilities to apply and integrate foundation knowledge of medicinal chemistry. Show limited ability to analyze pro correct but erroneous use of data and experimental results to draw appropriate cc knowledge of medicinal chemistry. Demonstrate partially effective basic technique discovery and metabolism.	nose related to drug di ip; pharmacokinetics; d knowledge and theory blems to most familiar onclusions relating to the	scovery; design and lrug delivery and its relating to the basic situations and mostly basic principles and			
	Fail	Demonstrate little or no evidence of command of knowledge and understanding theories relating to the basic foundation knowledge of medicinal chemistry; espect and development; drug targets; drug lead optimization; structure activity relations relevance to toxicity. Show little or no evidence of abilities to apply and integrate foundation knowledge of medicinal chemistry. Show little or no ability to analyzeroneous use of data and experimental results to draw appropriate conclusions in of medicinal chemistry. Demonstrate minimally effective basic techniques for mediand and metabolism.	cially those related to dr ship; pharmacokinetics; e knowledge and theory the problems to most fa elating to the basic print	ug discovery; design drug delivery and its relating to the basic miliar situations and ciples and knowledge			
Textbooks	G. Thomas T. Nogrady	k: An Introduction to Medicinal Chemistry (Oxford, 2009, 4th ed.) : Medicinal Chemistry: An Introduction (Wiley, 2000) , D.F. Weaver Medicinal Chemistry- A Molecular and Biochemical A rd & J. M. Berg: Principles of Bioinorganic Chemistry (1994)	Approach (Oxford, 2	2005, 3rd ed.)			

CHEM3505 Molecula	ar spectroscopy (6 credits)	Academic Year	2012				
Offering Department	Chemistry	Quota	132				
Course Co-ordinator	Prof D L Phillips, Chemistry						
Course Aim	This course provides a unifying treatment of the theories and applications of some important types of spectroscopy. Essential for graduate work in all branches of chemistry.						
Course Contents	Rotational (or Microwave) Spectroscopy, Vibrational Spectroscopy (both infrared and Raman), Electronic Spectroscopy.						
Learning Outcomes	On successful completion of this course, students should be able to: - Demonstrate knowledge and understanding of the molecular propertie involved in the major types of spectroscopy examined in this course - Explain and describe examples of the applications of the types of spectr - Compare the spectra and information that can be gained from the spece examined in the course	oscopy discussed ir	the course				
Pre-requisites	Pass in CHEM2503						
Offer in 2012 - 2013	Not offered To be confirmed						
Offer in 2013 - 2014	Ν						
Teaching Hours	24 hours lectures and 12 hours tutorials						

Assessment Method	One 2-hour examination (80% weighting) and continuous assessment (20% weighting)						
Course Grade	A+ to F						
Grade Descriptors	A						
	В						
	C						
	D						
	Fail						
Textbooks	Banwell: Fundamentals of Molecular Spectroscopy (3rd ed.) G. Herzberg: Molecular Spectra and Structure Vol. I, II, and III Wilson, Decius and Cross: Molecular Vibrations Townes and Schawlow: Microwave						
References	Banwell, Fundamentals of Molecular Spectroscopy (3rd ed) G. Herzberg, Molecular Spectra and Structure Vol. I, II, and III Wilson, Decius and Cross, Molecular Vibrations Townes and Schawlow, Microwave Spectroscopy Specialist texts for each section of the course						

CHEM3506 Compute	ational che	mistry (6 credits)	Academic Year	2012					
Offering Department	Chemistry		Quota	60					
Course Co-ordinator	Prof G H C	Prof G H Chen, Chemistry							
Course Aim	methods.	his course covers topics in computational chemistry including first-principles methods and molecular dynamics nethods. It is offered to undergraduate and postgraduate students interested in computational chemistry, omputational physics and computational biology.							
Course Contents		ock molecular orbital method, density-functional theory, time-de //MM method, free energy calculation, and computer-aided drug de	· · · ·	Basis sets, Force					
Learning Outcomes	<ul> <li>Understa</li> <li>Understa</li> <li>mechanics</li> <li>Employ t</li> </ul>	On successful completion of this course, students should be able to: Understand the basic concepts of density-functional theory; Understand the basic numerical techniques of molecular mechanics method and quantum mechanics/molecular nechanics 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		HEM2503 or PHYS2323; and dents who have already enrolled ir	this course.						
Offer in 2012 - 2013	2nd sem		Examination	Мау					
Offer in 2013 - 2014	Y	Y							
Teaching Hours	24 hours o	24 hours of lectures, 7 tutorials and 18 hours of computational lab							
Assessment Method	One 2-hou	rr written examination (80% weighting) and continuous assessmen	t (20% weighting)						
Course Grade	A+ to F								
Grade Descriptors	A Mastery of advanced knowledge on following topics: density-functional theory, Kohn-Sham equation, time-dependent density- functional theory, open system, molecular dynamics, force field, and quantum mechanics/molecular mechanics. Strong analytical and critical abilities and logical thinking, with strong ability to apply knowledge to practical problems in physical chemistry.								
	в	B Substantial command of a broad range of knowledge on following topics: density-functional theory, Kohn-Sham equation, time dependent density-functional theory, open system, molecular dynamics, force field, and quantum mechanics/molecular mechanics. Evidence of analytical and critical abilities and logical thinking, with ability to apply knowledge to practical problems in physical chemistry.							
	C Command of knowledge on following topics: density-functional theory, Kohn-Sham equation, time-dependent density-functional theory, open system, molecular dynamics, force field, and quantum mechanics/molecular mechanics. Evidence of some analytical and critical abilities and logical thinking, with ability to apply knowledge to familiar problems in physical chemistry.								
	D	Partial but limited command of knowledge on following topics: density-functiona density-functional theory, open system, molecular dynamics, force field, an Evidence of some coherent analytical and critical abilities and logical thinkin practical problems in physical chemistry.	orce field, and quantum mechanics/molecular mechanics						
	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.								
Textbooks	Robert G. J.M. Haile:	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. Le							
Remarks	This cours	e is equivalent to CHEM6109 (Computational Chemistry) for RPg.							

CHEM3507 Physical Theory (6 credits)	Chemistry II: Statistical Thermodynamics and Kinetic	Academic Year	2012			
Offering Department	Offering Department Chemistry					

Course Co-ordinator	Dr H Hu, C	Chemistry						
Course Aim		The course presents fundamental principles and topics on statistical thermodynamics and kinetic theory in order to provide a solid foundation for students intending to further their studies in physical chemistry and related fields.						
Course Contents	Thermody     Ensemble     Systems     Molecular     Ideal gas     Lattice sta     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						
Learning Outcomes	<ul> <li>understar</li> <li>course.</li> <li>demonstr</li> </ul>	On successful completion of this course, students should be able to: - understand and use the terminology and nomenclature in statistical thermodynamics and topics discussed in the course. - demonstrate knowledge and understanding of basic concepts in statistical thermodynamics - understand correlation between macroscopic observables and microscopic statistical model systems						
Pre-requisites		Pass in CHEM2504; and Not for students who have already passed in CHEM2503 before.						
Offer in 2012 - 2013	1st sem					Examination	Dec	
Offer in 2013 - 2014	Y							
Teaching Hours	24 lectures	s, 6 tutorials	and 6 X 4 hours la	boratory				
Assessment Method	One 3-hou (40%)	ur written ex	amination (60% w	eighting). Continuous	assessment	of on-class quizze	s and assignments	
Course Grade	A+ to F							
Grade Descriptors	A		e evidence of strong and	d level of extensive knowle alytical / critical abilities and I				
	B Substantial command of knowledge of statistical thermodynamics and reaction dynamics. Demonstrate evidence of critical abilities and logical thinking. Understand the scope of Physical Chemistry questions that can be appli 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	D Partial but limited command of knowledge of knowledge of statistical thermodynamics and reaction dynamics. Demonstrate limited evidence of analytical thinking. Understand the question to be solved with knowledge.						
	Fail	Little or no e	evidence of command of	knowledge of statistical ther	modynamics ar	nd reaction dynamics.		
Textbooks	T. L. Hill, A	Fail       Little or no evidence of command of knowledge of statistical thermodynamics and reaction dynamics.         T. L. Hill, An introduction to Statistical Thermodynamics         P. Atkins, Physical Chemistry						

CHEM3513 Advance	ed physical	chemistry (6 credits)	Academic Year	2012				
Offering Department	Chemistry		Quota	40				
Course Co-ordinator	Prof G H C	Prof G H Chen, Chemistry						
Course Aim		This course covers advanced topics in physical chemistry. It is offered for students majoring in physical chemisti and for students who are interested in postgraduate studies.						
Course Contents	dynamics.	The course includes topics in quantum chemistry, statistical thermodynamics, and molecular reaction dynamics. Variational method, Hartree-Fock method, ensembles, H-theorem, ratchet, molecular collisions, molecular beam experiments, reaction dynamics and other subjects are discussed.						
Learning Outcomes	- Understar - Understar	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						
Pre-requisites		Pass in CHEM2503; and Not for students who have already passed in CHEM3504 before.						
Offer in 2012 - 2013	Not offered		Examination	To be confirme				
Offer in 2013 - 2014	N							
Teaching Hours	24 hours of	i lectures and12 tutorials						
Assessment Method	One 2-hou	r written examination (80% weighting) and continuous assessr	nent (20% weighting)					
Course Grade	A+ to F							
Grade Descriptors	A	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 logic 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.							
	C 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							

	study. The workplace learning experience would be of great benefits to the students to apply their knowledge gained in the study to the real work environments. Students have to take on at least 160 hours of internship work either within the University or outside the University arranged by the School/Departments.					
Course Contents	various tas - Outside th be supervis Departmen	e University: The student will be supervised by a staff member ks as instructed by the Supervisor. he University: The student will work in an external agency related sed under a staff member of the external agency (the External S tt/School of the student (the Internal Supervisor). The work to be ed by the External Supervisor, with prior agreement of the Internal	to the major of stud Supervisor) and a s performed by the s	dy. The student will staff member of the		
Learning Outcomes	- apply kno	sful completion of this course, students should be able to: wledge in their major study in solving practical problems in the wo hand work experience in the industry related to their major study	ork place			
Pre-requisites	Students a	re expected to have satisfactorily completed their Year 2 study.				
Offer in 2012 - 2013	1st sem 2	2nd sem Summer	Examination	No Exam		
Offer in 2013 - 2014	Y					
Teaching Hours	No formal t 20 working	teaching, but it is expected that students are to work at least 160 days.	hours (lunch hour e	excluded) in at least		
Assessment Method	their intern internship	bletion of the internship, each student is required to submit a writte ship experience. Supervisors are required to assess the students period (in the case of internships outside the university, the Inter he feedback by the External Supervisor).	based on their perf	ormance during the		
Course Grade	Pass/Fail					
Grade Descriptors	Pass Demonstrate ability of applying knowledge of the subject area to carry out the work required in the job or assigned by supervisor(s). Demonstrate effective collaboration and communication with supervisor(s), colleagues, and clients in the job. Successfully fulfill the requirements set out in the Course Description regarding working hours, written report and oral presentation, and evaluation by supervisor(s).					
	Fail Demonstrate very limited or no ability of applying knowledge of the subject area to carry out the work required in the job or assigned by supervisor(s). Demonstrate ineffective collaboration or communication with supervisor(s), other colleagues, or clients in the job. Fail to satisfy the requirements set out in the Course Description regarding working hours, written report and oral presentation, or evaluation by supervisor(s).					
Remarks	who have of Satisfactory internship Students w Visit http://v Enrolment	re expected to have satisfactorily completed their Year 2 study. S completed Year 1. y completion of this course can be counted towards the Experie will be recorded on the student's transcript. This course will the are interested to enrol in this course should contact the Depar www.hku.hk/science/current/bsc/internship/ for more information. of this course is not conducted via the online course selection sy epartment/School office after approval has been obtained from the	ential Learning requ be assessed on P tment to obtain the rstem and should be	irement. Details of Pass or Fail basis. approval. e made through the		

ENVS2008 Pollution	(6 credits)		Academic Year	2012				
Offering Department	Chemistry		Quota	60				
Course Co-ordinator	Dr W T Ch	an, Chemistry						
Course Aim	To introduce students to the principles of chemical and biological processes of pollution development and the impacts of pollution on environmental health. The course provides the basics for advanced courses on environmental toxicology, environmental monitoring and testing, environmental impact assessment, biodiversity, waste treatment and technologies, and environmental remediation.							
Course Contents	Types of pollution and associated characteristics; strategy of pollution reduction and treatment; chemical and biochemical processes involved in pollution development; indicators and (bio)markers of pollution status; pollution monitoring techniques and application; interactions between biological systems and pollutants in aquatic and terrestrial environments; chemical toxicity, exposures and risk assessment; pollution of air, water and soil; global climate change, and stratospheric-ozone depletion; water pollution and wastewater treatment; harmful algal blooms; solid and hazardous waste; soil pollution and remediation.							
Learning Outcomes	On successful completion of this course, students should be able to: - explain types of pollution and their impact to the environment and population - explain mechanisms of pollution development - explain indicators and biomarkers of pollution and monitoring techniques of pollution - explain strategy of pollution reduction, treatment and remediation - explain chemical toxicity and risk assessment							
Pre-requisites	Pass in EN	IVS0001 or CHEM1009 or BIOL0126 or ENVS1002						
Offer in 2012 - 2013	Not offered	1	Examination	To be confirmed				
Offer in 2013 - 2014	Y							
Teaching Hours	24 lectures	; 36 hours of laboratory or literature review and tutorial; field trips	3					
Assessment Method		r written examination (60% weighting) and student-based asses at includes laboratory report, review reports, group project and pr						
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.							
		Demonstrate substantial grasp of the subject. Show evidence of analytical	abilities and logical thinki	ng, some evidence of				
		334						

	study. The workplace learning experience would be of great benefits to the students to apply their knowledge gained in the study to the real work environments. Students have to take on at least 160 hours of internship work either within the University or outside the University arranged by the School/Departments.					
Course Contents	various tas - Outside th be supervis Departmen	e University: The student will be supervised by a staff member ks as instructed by the Supervisor. he University: The student will work in an external agency related sed under a staff member of the external agency (the External S tt/School of the student (the Internal Supervisor). The work to be ed by the External Supervisor, with prior agreement of the Internal	to the major of stud Supervisor) and a s performed by the s	dy. The student will staff member of the		
Learning Outcomes	- apply kno	sful completion of this course, students should be able to: wledge in their major study in solving practical problems in the wo hand work experience in the industry related to their major study	rk place			
Pre-requisites	Students a	re expected to have satisfactorily completed their Year 2 study.				
Offer in 2012 - 2013	1st sem 2	2nd sem Summer	Examination	No Exam		
Offer in 2013 - 2014	Y					
Teaching Hours	No formal t 20 working	teaching, but it is expected that students are to work at least 160 h days.	nours (lunch hour e	excluded) in at least		
Assessment Method	their intern internship	bletion of the internship, each student is required to submit a writte ship experience. Supervisors are required to assess the students I period (in the case of internships outside the university, the Interr he feedback by the External Supervisor).	based on their perf	ormance during the		
Course Grade	Pass/Fail					
Grade Descriptors	Pass Demonstrate ability of applying knowledge of the subject area to carry out the work required in the job or assigned by supervisor(s). Demonstrate effective collaboration and communication with supervisor(s), colleagues, and clients in the job. Successfully fulfill the requirements set out in the Course Description regarding working hours, written report and oral presentation, and evaluation by supervisor(s).					
	Fail Demonstrate very limited or no ability of applying knowledge of the subject area to carry out the work required in the job or assigned by supervisor(s). Demonstrate ineffective collaboration or communication with supervisor(s), other colleagues, or clients in the job. Fail to satisfy the requirements set out in the Course Description regarding working hours, written report and oral presentation, or evaluation by supervisor(s).					
Remarks	who have of Satisfactor internship Students w Visit http://v Enrolment	oral presentation, or evaluation by supervisor(s).         Students are expected to have satisfactorily completed their Year 2 study. Special consideration be given to those who have completed Year 1.         Satisfactory completion of this course can be counted towards the Experiential Learning requirement. Details of internship will be recorded on the student's transcript. This course will be assessed on Pass or Fail basis. Students who are interested to enrol in this course should contact the Department to obtain the approval. Visit http://www.hku.hk/science/current/bsc/internship/ for more information.         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.				

	(6 credits)		Academic Year	2012					
Offering Department	Chemistry		Quota	60					
Course Co-ordinator	Dr W T Cha	an, Chemistry							
Course Aim	impacts of environmer	To introduce students to the principles of chemical and biological processes of pollution development and the impacts of pollution on environmental health. The course provides the basics for advanced courses on environmental toxicology, environmental monitoring and testing, environmental impact assessment, biodiversity, waste treatment and technologies, and environmental remediation.							
Course Contents	biochemica monitoring terrestrial e climate cha	Types of pollution and associated characteristics; strategy of pollution reduction and treatment; chemical and biochemical processes involved in pollution development; indicators and (bio)markers of pollution status; pollution monitoring techniques and application; interactions between biological systems and pollutants in aquatic and terrestrial environments; chemical toxicity, exposures and risk assessment; pollution of air, water and soil; global climate change, and stratospheric-ozone depletion; water pollution and wastewater treatment; harmful algal blooms; solid and hazardous waste; soil pollution and remediation.							
Learning Outcomes	<ul> <li>explain typ</li> <li>explain moduling</li> <li>explain ind</li> <li>explain str</li> </ul>	sful completion of this course, students should be able to: pes of pollution and their impact to the environment and populatio echanisms of pollution development dicators and biomarkers of pollution and monitoring techniques of rategy of pollution reduction, treatment and remediation memical toxicity and risk assessment							
Pre-requisites	Pass in EN	VS0001 or CHEM1009 or BIOL0126 or ENVS1002							
	0.1		Examination	May					
Offer in 2012 - 2013	2nd sem			iviay					
	2nd sem Y			Iviay					
Offer in 2013 - 2014	Y	; 36 hours of laboratory or literature review and tutorial; field trips		IVIAY					
Offer in 2013 - 2014 Teaching Hours	Y 24 lectures One 2-hour	; 36 hours of laboratory or literature review and tutorial; field trips r written examination (60% weighting) and student-based assess t includes laboratory report, review reports, group project and pre	ment (40% weightin	g). Student-based					
Offer in 2013 - 2014 Teaching Hours Assessment Method	Y 24 lectures One 2-hour	r written examination (60% weighting) and student-based assess	ment (40% weightin	g). Student-base					
Offer in 2012 - 2013 Offer in 2013 - 2014 Teaching Hours Assessment Method Course Grade Grade Descriptors	Y 24 lectures One 2-hour assessmen	r written examination (60% weighting) and student-based assess	ment (40% weightin sentations or other for abilities, logical and inde r situations. Demonstrate	g). Student-based prms. pendent thinking, and highly proficient lab					

	В	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 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.				
Textbooks	Marquita	Marquita K. Hill: Understanding Environmental Pollution (Cambridge University Press, 2nd edition)				
Remarks	Offered f	rom 2010-2011				

CSCI0001 Practical credits)	Chinese la	inguage	course for	science s	tudents (3	3		Academic Year	2012
Offering Department	Chinese	Chinese						Quota	
Course Co-ordinator	Mr K W Wo	/ong, Chine	ese						
Course Aim	master the and rhetor	e standard oric of read	formats and der-based sc	techniques ientific/techr	of Chinese	practical gs are i	writings. In ncluded. Dri	ne workplace. It hel addition, topics ad illing practices are in the workplace.	dressing the sty
Course Contents			nodern Chine s - Office docu					racters - Letters, m ls	nemos, email ar
Learning Outcomes	Chinese ar for the use address ne	On successful completion of the course, students should be able to: - Develop a balanced competency in modern Chinese and write well-formed sentences; - Develop a firm grasp of various writing and communication techniques for the use of practical Chinese; - Explore new tactics of communication, initiate discussions and debates and address new challenges; - Apply their disciplinary knowledge and their Chinese writing skills and professional presentation techniques analytically, critically and creatively in different social or professional discourses.							
Pre-requisites	NIL (This c	course is c	compulsory for	r all BSc stu	dents)				
Offer in 2012 - 2013	1st sem							Examination	Dec
Offer in 2013 - 2014	Y								
Teaching Hours			7 hours of turent (including			p work;	12 hours of s	self study; 12 hours	of homework a
Assessment Method		One 2-hour written examination (50% weighting); written project and web-based quiz (40% weighting); tutorial discussion (10% weighting)							
		1 (10% wei	ghting)	(	0,1				0 0,0
Course Grade	A+ to F	1 (10% wei	ghting)	(					
Course Grade Grade Descriptors	A+ to F	The stude	ent acquired a s	superb ability to				nes of the course at a mmunication in all situa	
		The stude describe, a The stude	ent acquired a s apply, evaluate, a	superb ability to achie	the language ve the intende	techniques ed learning	for effective co outcomes of th		tions.
	A	The stude describe, a The stude apply, eva The stude describe a	ent acquired a s apply, evaluate, a ent acquired the aluate, and synthe	superb ability tr and synthesize ability to achie esize the langu quate ability to nguage techniq	the language ve the intende age technique achieve the in ues for effectiv	techniques ed learning s for effect ntended lea ve commun	for effective co outcomes of the ve communicate arning outcomes	mmunication in all situation in all situation of the second sec	tions. of learning: describe evels of learning (i.
	A B	The stude describe, a The stude apply, eva The stude describe a synthesize	ent acquired a s apply, evaluate, a ant acquired the aluate, and synthe ent acquired adea and apply the lar	superb ability to and synthesize ability to achie esize the langu quate ability to rguage techniq echniques for el	the language ve the intende age technique achieve the ir ues for effective fective communication	techniques ed learning s for effect ntended lea ve commun	for effective co outcomes of the ve communicate arning outcomes	mmunication in all situation ne course at all levels of ion in most situations. s of the course at low le	tions. of learning: describe evels of learning (i.
	A B C	The stude describe, a The stude apply, eva The stude describe a synthesize The stude	ent acquired a s apply, evaluate, a ant acquired the aluate, and synthe ant acquired adee and apply the lar e the language te	superb ability tr and synthesize ability to achie esize the langu quate ability to nguage techniq cchniques for el c familiarity with	the language ve the intende age technique achieve the in ues for effective fective commu- the subject.	techniques ed learning s for effect ntended lea ve commun	for effective co outcomes of the ve communicate arning outcomes	mmunication in all situation ne course at all levels of ion in most situations. s of the course at low le	tions. of learning: describe evels of learning (i.
Grade Descriptors	A B C D	The stude describe, a The stude apply, eva The stude describe a synthesize The stude	ent acquired a s apply, evaluate, a ent acquired the aluate, and synthe ent acquired ade and apply the lar e the language te int only has basic	superb ability tr and synthesize ability to achie esize the langu quate ability to nguage techniq cchniques for el c familiarity with	the language ve the intende age technique achieve the in ues for effective fective commu- the subject.	techniques ed learning s for effect ntended lea ve commun	for effective co outcomes of the ve communicate arning outcomes	mmunication in all situation ne course at all levels of ion in most situations. s of the course at low le	tions. of learning: describe evels of learning (i.
	A B C D Fail 周錫韋复:	The stude describe, i The stude apply, eva The stude describe a synthesize The stude The stude The stude	ent acquired a s apply, evaluate, a ant acquired the aluate, and synthe ent acquired adea and apply the lar e the language te int only has basic int has very limite	superb ability to and synthesize ability to achie esize the langu quate ability to rguage techniq chniques for el chamiliarity with ed familiarity with (1996) 汪	the language ve the intended age technique achieve the in ues for effectiv fective commu- the subject. th the subject. 體炎:《漢	techniques ed learning s for effect ntended lea ve commu unication).	for effective co outcomes of ti ve communicat arrning outcome nication) but no (1998) 香	mmunication in all situation ne course at all levels of ion in most situations. s of the course at low le	tions. of learning: describe evels of learning (i. ing (i.e. evaluate an
Grade Descriptors Textbooks	A B C D Fail 周錫韋复:	The stude describe, i The stude apply, eva The stude describe a synthesize The stude The stude The stude	ent acquired a s apply, evaluate, a ant acquired the aluate, and synthe ent acquired adea and apply the lar a the language te int only has basic int has very limite 用寫作教程》	superb ability to and synthesize ability to achie esize the langu quate ability to rguage techniq chniques for el chamiliarity with ed familiarity with (1996) 汪	the language ve the intended age technique achieve the in ues for effectiv fective commu- the subject. th the subject. 體炎:《漢	techniques ed learning s for effect ntended lea ve commu unication).	for effective co outcomes of ti ve communicat arrning outcome nication) but no (1998) 香	mmunication in all situa ne course at all levels o ion in most situations. s of the course at low le t at high levels of learni	tions. of learning: describe evels of learning (i. ing (i.e. evaluate an

CSCI2002 Advanced	I language	studies in Chinese (3 credits)	Academic Year	2012				
Offering Department	Chinese		Quota					
Course Co-ordinator	Mr K W Wo	Mr K W Wong, Chinese						
Course Aim	science an to develop	This course aims to further enhance the students' Chinese proficiency for effective communication in the fields of science and technology. It seeks to expand the students' vision of culture, history and literature; it also helps them to develop their sense of logic that is essential for text analysis, information collection, selection and sharing in the field of science. In response to the students' request, workshops on the use of Chinese for job applications are organized.						
Course Contents	Manageme genres - Pr and rhetor dimensions	- Proficiency in Chinese: diction, grammar and style; idioms and proverbs; quotable quotes - Information Management and Writing: text analysis; information collection and selection; information sharing in writing different genres - Professional Writings for Promotional Purposes: reader-centred and attention-getting writings; persuasive and rhetorical powers; readability formulas of professional writing - Culture, Language and Society: cultural dimensions of language, history and literature; politics in modern Chinese literature - Workshops on job applications in Chinese and advanced oral presentations						
Learning Outcomes	Chinese fo organize a writings to	On successful completion of the course, the students should be able to: - Apply essential techniques of using Chinese for job applications - Draw on latest advances in Information and Communications Technology (ICT) to organize and present ideas in cyberspace - Demonstrate a high level of communicative competence in practical writings to accomplish different tasks - Employ a variety of linguistic and rhetorical means to achieve effective communication						
Pre-requisites	Pass in CS	SCI0001						
Offer in 2012 - 2013	1st sem		Examination	No Exam				
Offer in 2013 - 2014	Y							
Teaching Hours		f lectures; 4 hours of tutorials; 3 hours of workshops; 12 hours of homework	of online learning; 15 h	ours of self study				
Assessment Method	Written pro	ject and web-based quiz (60%); tutorial discussion (10%); works	shop (30%)					
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.							
	с	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	D The student only has basic familiarity with the subject.						
	Fail         The student has very limited familiarity with the subject.							
<b>Fextbooks</b>	NIL							
I CALDOOKS		黄健成:《寫作學教程》(2002)汪麗炎:《漢語寫作》(1998)雲桂賓:《語言行為與語言技能》(1998)譚學						
References		<ul> <li>(2002) 汪麗炎:《漢語寫作》(1998) 雲桂賓:</li> <li>(2000) 顧興義:《應用語體學》(2000)</li> </ul>	《語言行為與語言技能	作》( <b>1998</b> )譚學				
			《語言行為與語言技能	と》(1998)譚學				

EASC0003 Natural h	nazards and	I geological risk (6 credits) Academic Year	2012						
Offering Department	Earth Sciences Quota								
Course Co-ordinator	Dr K H Lem	nke, Earth Sciences							
Course Aim	pose poten hazard pror	Natural hazards such as volcanoes, earthquakes, tsunamis, typhoons, floods, droughts, wildfires and landslides pose potential threats to an increasing number of humans. Climate change strongly influences the dynamics in hazard prone areas. This course aims to develop an awareness and understanding of the scale of these and other geological risks and their driving forces in order to develop suitable risk mitigation strategies.							
Course Contents		Earthquakes, tsunamis, volcanoes, typhoons, floods, droughts, landslides, wildfires, global catastrophes such as meteorite impact, pandemics, social impact and responses to risks, risk management.							
Learning Outcomes	<ul> <li>To explai potential, to</li> <li>To be abl</li> <li>behaviour in</li> <li>To provide</li> </ul>	sful completion of this course, students should be able to: in and highlight connections between specific geological environments and thei o discuss the impact of select hazards on society. le to explain relationships between basic physical properties of natural material ai n solids, vapors and liquids. e examples of how complex natural systems respond to man-made perturbations. nples of how societies have (un)successfully dealt with hazard preparedness and m	nd their macroscopio						
Pre-requisites	NIL								
Offer in 2012 - 2013	Not offered	Examination	To be confirmed						
Offer in 2013 - 2014	N								
Teaching Hours		f lectures/seminars, up to 12 hours of group discussion. Field trip: A one-day fiel articipants to potential natural hazards in Hong Kong	d trip will be held to						
Assessment Method	One 2-hour	written examination (50% weighting) and coursework assessment (50% weighting							
Course Grade	A+ to F								
Grade Descriptors	А								
	В								
	С								
	D								
	Fail								

EASC0004 Early Life	e on Earth	6 credits)		Academic Year	2012			
Offering Department	Earth Scie	nces		Quota				
Course Co-ordinator	Dr K H Le	nke, Earth Sciences						
Course Aim	This course focuses on the origins of life. It provides an overview of Earth's early environments, how life is though to have originated on Earth, and how the Earth's dynamic environment impacted the origin of life. This course wil also provide a basic overview of habitable environments on Earth and elsewhere in the Solar system.							
Course Contents	oceans; th Solar syst	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.						
Learning Outcomes	-describe -explain a molecules -understar -identify cl	sful completion of this course, student ne basic physical and chemical condit nd describe the role of water and d the role that different geological env allenges associated with each step in a current 'origins of life' topic.	tions on the early Earth. extreme geochemical condit <i>r</i> ironments played during the c		sis of biological			
Pre-requisites	NIL							
Offer in 2012 - 2013	2nd sem			Examination	May			
Offer in 2013 - 2014	Y							
Teaching Hours	24 hours of	flectures, up to 24 hours of group pre	esentations & seminars.					
Assessment Method		r written examination (40% weighting / (60% weighting).	g) and coursework assessme	nt: 1 midterms, grou	up presentations			
Course Grade	A+ to F							
Grade Descriptors								
B Student demonstrates substantial command of a broad range of knowledge and skills required for attaining at leas course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and apply his/her l a range of problems in the field of the "origins of life", and at the same, is capable to combine knowledge from sciences to better understand potential early Life processes on Earth and elsewhere. Student shows the abi effective organizational and presentational skills.								

	С	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	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.
Textbooks	Astrobiolog	rom: Mason, S.F.: Chemical Evolution (Oxford University Press, 1991); K.W. Plaxco & M. Gross: gy: A brief Introduction (J. Hopkins University Press, 2006); I. Gilmour & M.A. Sephton: An Introduction logy (Cambridge University Press, 2004)

EASC0009 Peaceful	use of nue	uclear	r technologie	es (6 credits)			Academic Year	2012	
Offering Department	Earth Scie	Earth Sciences					Quota		
Course Co-ordinator	Dr S H Li,	Dr S H Li, Earth Sciences							
Course Aim				science backgrou s of current applie			ation of nuclear teo case studies.	chnologies in dail	
Course Contents	engineerin	ring, bi	iological, physic	cal and social so	ciences; radiatio	on on earth a	uclear techniques nd beyond; indust in nuclear technolo	rial application o	
Learning Outcomes	- recognize - explain a - have the	ize the and de ie awar	e science fundan lescribe the prin ireness of currer	is course, studen nentals in nuclear ciples of nuclear t nt applications of and understanding	technologies technologies ap nuclear science	plied. s	ssociated with nucl	ear technologies.	
Pre-requisites	Not for stu	tudents	ts who have alre	ady passed in EA	SC0002 before	Э.			
Offer in 2012 - 2013	1st sem						Examination	Dec	
Offer in 2013 - 2014	Y								
Teaching Hours	24 hours le	lecture	res and up to 24	hours of tutorials	, library study, j	project work ar	nd practical / field w	ork	
Assessment Method	One 2-hou	our writ	itten examinatio	n (50% weighting	); Group activiti	es and reports	(30%); Individual p	roject (20%)	
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.							
	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.								
Textbooks	To be ann	nounc	ced						
References	To be ann	nounce	ced						

EASC0105 Earth thr	Academic Year	2012					
Offering Department	Earth Sciences	Quota					
Course Co-ordinator	Dr Y Li, Earth Sciences						
Course Aim	To introduce the concept of geological time and basic geological p fossil record and the integration of Earth Systems and plate tectonic Universe, an understanding of the evolution of Earth and life on Earth	s. To gain an appreciation o					
Course Contents	Geological time, the origin of life, fossils and diversification of life through time, Important events in Earth history such as Snowball Earth, the Cambrian explosion of life, the Permian/Triassic mass extinction, the Cretaceous Tertiary extinction event, the origins of humans						
Learning Outcomes	On successful completion of this course, students should be able to: - Define basic geological principles - Explain critical geological relationships - Outline the history of the development of our planet - Interpret the geological record of evolution through time - Compare and contrast various hypotheses put forward to explain m						
Pre-requisites	NIL						

Offer in 2012 - 2013	2nd sem Examination May						
Offer in 2013 - 2014	Y	Υ					
Teaching Hours	24 hours	of lectures, up to 24 hours of labs, group discussion and class del	bate				
Assessment Method	One 2-ho	ur written examination (50% weighting) and coursework assessme	ent (50% weighting)				
Course Grade	A+ to F						
Grade Descriptors	A	Lectures: Demonstrate thorough mastery at an advanced level of extensive learning outcomes. Show strong analytical and critical abilities and learning outcomes. Show strong analytical and critical abilities and learning outcomes. Show strong interest in the taught topics; able to finish all the laboratory projects with answer most questions correctly and accurately. Laboratory: Demonstrate analytical and critical abilities and logical thinking, with evidence of original the and techniques. Critical use of data and results to draw appropriate and organizational and presentational skills. Attend all the laboratory classes processing and analysis; presenting lab reports with accurate language and context.	ogical thinking, with evidence ive organizational and press tith great efforts and get insi e thorough grasp of the s iought. Apply highly effectiv d insightful conclusions. A ; showing strong ability in	e of original thought entational skills. Shov ghtful results. Able to ubject. Show strong e lab / fieldwork skills pply highly effective			
	В	Lectures: Demonstrate substantial command of a broad range of knowledge the course learning outcomes. Show evidence of analytical and critical organizational and presentational skills. Show interest in the taught topics; efforts and get correct results. Able to answer most questions correctly. Le subject. Evidence of analytical and critical abilities and logical thinking. App Correct use of data of results to draw appropriate conclusions. Apply effectiv all the laboratory classes; showing ability in experiments, data processing a results.	abilities and logical think able to finish most the lab aboratory: Demonstrate sub ly effective lab / fieldwork s e organizational and presen	ting. Apply effective poratory projects with ostantial grasp of the skills and techniques ntational skills. Attend			
	С	Lectures: Demonstrate general but incomplete command of knowledge and learning outcomes. Apply moderately effective organizational and presentatio to finish 65% laboratory projects with correct results. Able to answer mos general but incomplete grasp of the subject. Evidence of some analytical moderately effective lab / fieldwork skills and techniques. Mostly correct but appropriate conclusions. Apply moderately effective organizational and pres classes; showing ability in experiments, data processing and analysis; present	nal skills. Show interest in t st questions correctly. Labo and critical abilities and lo some erroneous use of dat sentational skills. Attend m	he taught topics; able pratory: Demonstrate gical thinking. Apply a and results to draw ost of the laboratory			
	D	Lectures: Demonstrate partial but limited command of knowledge and skills r outcomes. Show evidence of some coherent and logical thinking, but with lim ability to apply knowledge to solve problems. Apply limited or barely effectiv some interest in the taught topics; able to finish 65% laboratory projects with than half of questions correctly. Laboratory: Demonstrate partial but limited g of the subject. Evidence of some coherent and logical thinking, but with limit effective lab / fieldwork skills and techniques. Limited ability to use data and limited or barely effective organizational and presentational skills. Attend >5 experiments, data processing and analysis; presenting lab reports with accept	nited analytical and critical a re organizational and prese h generally correct results. rasp, with retention of some ted analytical and critical al d results to draw appropria 0% of the laboratory class	abilities. Show limited ntational skills. Show Able to answer more relevant information pilities. Apply partially te conclusions. Apply			
	Fail	Lectures: Demonstrate little or no evidence of command of knowledge and outcomes. Lack of analytical and critical abilities, logical and coherent thinking to solve problems. Organization and presentational skills are minimally effecti in learning; not able to finish the laboratory project; not able to answer most of little or no grasp of the knowledge and understanding of the subject. Evidence logical and coherent thinking. Apply minimally effective or ineffective lab / fiel results and/or unable to draw appropriate conclusions. Organization and ineffective. Miss more than half of lab work; not able to trun laboratory reports data processing; the lab report fail to give correct result.	J. Show very little or no abilitive or ineffective. Does not f questions. Laboratory: Der e of little or lack of analytica dwork skills and technique: presentational skills are n	ty to apply knowledge show positive attitude nonstrate evidence o al and critical abilities s. Misuse of data and ninimally effective or			

EASC0116 Introduct	tion to phy	sical geology (6 credits)	Academic Year	2012				
Offering Department	Earth Scie	nces	Quota					
Course Co-ordinator	Prof L S C	Prof L S Chan, Earth Sciences						
Course Aim		The course, intended for students taking their first course in earth science, provides a basic overview of the earth's structure, material and internal and external processes.						
Course Contents	and Sedim	Historical Development of Earth Sciences, Matter and Minerals, The Rock Cycle, Volcanic Activity, Sedimentation and Sedimentary Rocks, Metamorphism, Geologic Time, Dating Methods, Weathering and Soil, Landslides, Fluvial and Groundwater Processes, Plate Tectonics, Earthquakes, Crustal Deformation.						
Learning Outcomes	- describe - identify th - acquire s	sful completion of this course, students should be able to: the basic concepts of physical geology ne most common minerals and rocks ome field experience and learned to make observation and desc the relevance of physical geology to Hong Kong	ription					
Pre-requisites	NIL							
Offer in 2012 - 2013	1st sem		Examination	Dec				
Offer in 2013 - 2014	Y							
Teaching Hours	The course	e consists of 16 hours of lectures, 16 hours of practicals/tutorials	and 2 days of field trip	os.				
Assessment Method	One 2-hou presentation	ur written examination (50%); Practical reports (25%); Project on (10%)]	(25%) [requiring a re	port (15%) and a				
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							

		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.
Textbooks	Tarbuck	E. J. and Lutgens F. K.: The Earth: An Introduction to Physical Geology (latest edition)

EASC0117 Geologic	al heritag	age of I	long Kong (3 credits)		Academic Year	2012		
Offering Department	Earth Sc	Sciences			Quota	45		
Course Co-ordinator	Prof M F	F Zhou,	Earth Sciences					
Course Aim			rview of the geology of Hong Kong, po evelopment of Hong Kong's infrastructure		esources for touris	m and the role of		
Course Contents	knowledg	dge pert	eneral geology of Hong Kong, geology o aining to large scale construction project d by experts to localities of geological inte	plus at least 3 weel				
Learning Outcomes	<ul> <li>acquire</li> <li>underst</li> </ul>	On successful completion of this course, students should be able to: acquire an appreciation of the processes leading to the formation of various landforms understand of the major morphological features in Hong Kong enhance the observation and analytical skills, and physical ability through participation in the field excursion						
Pre-requisites	NIL							
Offer in 2012 - 2013	2nd sem	m			Examination	No Exam		
Offer in 2013 - 2014	N							
Teaching Hours	3 lecture	res (1 ho	ur) & 3 weekend field trips					
Assessment Method	A 1-hour	ur quiz (4	0%) and coursework assessment in form	of participation (30	%) and an essay (3	0%)		
Course Grade	A+ to F							
Grade Descriptors	A	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	Fail No or little knowledge about the subject. No evidence for attaining the course learning outcomes. Lack of analytical and abilities, logical and coherent thinking. Very little or no ability for field observation and for solving problems. Poor organ and presentational skills.						
Textbooks		ecomme						

EASC0118 Blue plan	net (6 credits)	Academic Year	2012						
Offering Department	Earth Sciences	Quota							
Course Co-ordinator	Dr P Bach, Earth Sciences	Dr P Bach, Earth Sciences							
Course Aim	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	The course will introduce and discuss the following topics: Habitable Plate Tectonics, Volcanism, Earthquakes, Surface Processes and Groundwater, Oceans and Water Cycle), Atmosphere (Compositic Oxygen Cycle), Biosphere (Life, Evolution and Extinction, Carbon ( Earth Systems, Human Interactions with Planet Earth (Earth Resou Human Impact and Environmental Changes).	I Rock Cycle), Hydrospher on, Weather, Climate, Gree Cycle), Concepts and Evol	re (Surface- and en House Effect, ution of Dynamic						
Learning Outcomes	On successful completion of this course, students should be able to: - Understand the terminology and nomenclature appropriate to the int - Demonstrate knowledge and understanding of the underlying cond Systems and their dynamic interactive processes - Understand the extent and nature of global change and environment	cepts associated with the s							
Pre-requisites	NIL								
Offer in 2012 - 2013	1st sem 2nd sem	Examination	Dec May						
Offer in 2013 - 2014	Y								
Teaching Hours	24 hours of lectures, 24 hours of practical work, student centered lear	24 hours of lectures, 24 hours of practical work, student centered learning and one 2-day field camp							

Assessment Method	One 2-hour written examination (40% weighting); quizzes (10% weighting); laboratory reports (20% weighting) and field project report (30% weighting)		
Course Grade	A+ to F		
Grade Descriptors	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.		
	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.		
	C Demonstrate general but incomplete command of knowledge / competencies/skills at an Earth Science introductory level required for attaining most of the course learning outcomes. Shows evidence for some understanding of introductory terminology and concepts and some abilities to apply and relate them in some interactive processes between Earth Systems. Demonstrates moderately effective observational skills in field as well as organizational skills to present observations made mostly correct but with some erroneous use and results to draw appropriate conclusions.		
	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 observed in Applies limited or barely effective organizational and presentational skills to present observed details and facts correctly. Limited ability to draw appropriate conclusions.		
	Fail Demonstrate little or no evidence of command of knowledge / competencies/skills at an Earth Science introductory level required for attaining the course learning outcomes. Shows little or no evidence of understanding of introductory terminology and concepts and little or no abilities to apply and relate them in interactive processes between Earth Systems. Demonstrates poor observational skills. Ineffective presentation of observational skills. Ineffective presentation of observations and tacts and unable to draw appropriate conclusions.		
Textbooks	Skinner B.J and Porter S.C.: The Blue Planet (1999) Murphy, B and Damian N.: Earth Science Today (1999)		

EASC0122 Introduct		iiiiaid	science (o credits)		Academic Year	2012		
Offering Department	Earth Sci	Earth Sciences Quota						
Course Co-ordinator	Dr Z Liu,	Dr Z Liu, Earth Sciences						
Course Aim	controls o geologica	This course provides an introduction to the study of global climate systems and climate change. We study the controls of temporal and spatial variations in earth's climate and its histories of past climates preserved in the geological record. We look at modern research methods that are used in paleoclimatic and paleoenvironmenta reconstructions.						
Course Contents	geologic	Global climatic systems, climate classification, natural variability of climate, physical causes for changes through geologic time, external and internal forcing mechanisms, solar orbital variations, major climatic events of the past and their effects on how our planet has developed, glacial and interglacial oscillations, predicting future global change.						
Learning Outcomes	<ul> <li>Identify</li> <li>explain t</li> <li>understa</li> </ul>	In successful completion of this course, students should be able to: Identify major aspects of climatology and approaches to climatological study, explain the factors and physical processes controlling climate system, understand the driving forces of Earth's climate change, recognize the history of Earth's climate change						
Pre-requisites	NIL							
Offer in 2012 - 2013	2nd sem	n			Examination	Мау		
Offer in 2013 - 2014	Y							
Teaching Hours	24 hours	s of lea	tures, up to 24 hours of labs, group o	iscussion and class deba	te			
Assessment Method	One 2-ho	nour wi	tten examination (50% weighting) an	d coursework assessmen	t (50% weighting).			
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 ful range of high quality sources and to quote/reference aptty.							
	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 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 o 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 lear outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to r familiar situations. Demonstrate mostly correct but some erroneous use of data and results to draw appropriate conclusi Show use of relevant information from sources and ability to make comparisons between different interpretations an 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	La pr	monstrate little or no evidence of command ck of analytical and critical abilities, logical ar blems. Demonstrate misuse of data and re condary sources and no critical comparison of	d coherent thinking. Show very sults and/or unable to draw a	little or no ability to apply	/ knowledge to solv		
Textbooks	Buddimou	an W	F.: Earth's Climate Past and Future	W E Freeman 2008 2n	d adition)			

## Robert V. Rohli and Anthony J. Vega: Climatology (Jones and Bartlett Publishers, 2008)

geology (	6 creaits)			Academic Year	2012		
Earth Scier	nces			Quota			
Dr M H Lee, Earth Sciences							
matter in the emphasis incorporate analogues	This course provides students with an introduction to the origin, evolution, structure, composition and distribution o matter in the Solar System condensed in the form of planets, satellites, comets, asteroids and rings, with particula 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.						
Venus, the	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.						
- Describe - Explain h - Demonst the structure	<ul> <li>Describe the basic features of our Solar System and its constituents.</li> <li>Explain how this knowledge is acquired through observations and experiments.</li> <li>Demonstrate knowledge and understanding of the key geological, physical and chemical processes governin the structure, formation and evolution of planetary bodies.</li> </ul>						
E or above	in AL Biol or Ch	em or Phys or Pure Ma	th or Applied Math or Eng	gineering Science			
2nd sem				Examination	May		
Y							
24 hours of	f lectures, up to 2	24 hours of tutorials/pra	cticals/seminars				
One 2-hou	r written examina	ation (50%); Coursewor	k: Test (15%), Assignmer	nts (20%), Presentatio	on (15%)		
A+ to F							
A	A Demonstrate thorough mastery of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.						
B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course I 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.							
	Earth Scien Dr M H Lee This course matter in th emphasis incorporate analogues Solar Syste Formation, Venus, the moons; Plu System. On succes - Describe - Explain h - Demonst the structu - Compare E or above 2nd sem Y 24 hours o One 2-hou A+ to F A B C D	This course provides stude matter in the Solar System emphasis on surface feat incorporates the findings analogues to extraterrestris Solar System.         Formation, evolution, interr Venus, the Earth-Moon sy moons; Pluto, Charon and System.         On successful completion of - Describe the basic feature - Explain how this knowledge the structure, formation and - Compare and contrast ou         E or above in AL Biol or Ch 2nd sem         Y         24 hours of lectures, up to 2         One 2-hour written examina A+ to F         B       Demonstrate store familiar and some familiar and some familiar situations.         D       Demonstrate geno outcomes. Show of familiar situations.         D       Demonstrate geno outcomes. Show of familiar situations.         D       Demonstrate little	Earth Sciences         Dr M H Lee, Earth Sciences         This course provides students with an introduction matter in the Solar System condensed in the form emphasis on surface features, internal structure incorporates the findings from recent space in analogues to extraterrestrial features into a fasci Solar System.         Formation, evolution, internal structure and surface Venus, the Earth-Moon system, and Mars; the moons; Pluto, Charon and the Kuiper Belt; astere System.         On successful completion of this course, students - Describe the basic features of our Solar System at Explain how this knowledge is acquired through of - Demonstrate knowledge and understanding of the structure, formation and evolution of planetary - Compare and contrast our own planet Earth with         E or above in AL Biol or Chem or Phys or Pure Matter Structure of lectures, up to 24 hours of tutorials/pration strong analytical and critical abilities and logical wide range of complex, familiar and unfamiliar struations. Apply explanet substantial command of a broad learning outcomes. Show evidence of some analytical and infamiliar and some unfamiliar situations. Apply moderately effective on Demonstrate partial but limited command of a planet familiar and some unfamiliar situations. Apply moderately effective on the structure show evidence of some coherent and logical apply knowledge to solve problems. Apply limititient down and planetary of extensions. Apply infamiliar analytical and price of some coherent and logical apply knowledge to solve problems. Apply limititient down and of a domand of a planet familiar situations. Apply infamiliar analytical and planetary of some coherent and logical apply knowledge to solve problems. Apply limititient down and the structure and solar solar solar solar situating and solar	Earth Sciences         Dr M H Lee, Earth Sciences         This course provides students with an introduction to the origin, evolution, s matter in the Solar System condensed in the form of planets, satellites, com emphasis on surface features, internal structures and histories from a incorporates the findings from recent space investigations, planetary analogues to extraterrestrial features into a fascinating portrayal of the ge Solar System.         Formation, evolution, internal structure and surface processes of planetary venus, the Earth-Moon system, and Mars; the giant planets Jupiter, Se moons; Pluto, Charon and the Kuiper Belt; asteroids, meteorites, cornets a System.         On successful completion of this course, students should be able to: - Describe the basic features of our Solar System and its constituents. - Explain how this knowledge is acquired through observations and experim - Demonstrate knowledge and understanding of the key geological, physic the structure, formation and evolution of planetary bodies.         E or above in AL Biol or Chem or Phys or Pure Math or Applied Math or Eng 2nd sem         Y         24 hours of lectures, up to 24 hours of tutorials/practicals/seminars         One 2-hour written examination (50%); Coursework: Test (15%), Assignmer A+ to F         A       Demonstrate thorough mastery of extensive knowledge and skills required for strong analytical and critical abilities and logical thinking, with evidence of orig wide range of complex, familiar and unfamiliar situations. Apply highly effective and active and some unfamiliar situations. Apply effective organizational and presentationa familiar and some unfamiliar situations. Apply effective organizational and presentationa familiar and some unfamili	Earth Sciences       Quota         Dr M H Lee, Earth Sciences       This course provides students with an introduction to the origin, evolution, structure, composition matter in the Solar System condensed in the form of planets, satellites, comets, asteroids and rin emphasis on surface features, internal structures and histories from a geological point of v incorporates the findings from recent space investigations, planetary imagery, remote ser analogues to extraterrestrial features into a fascinating portrayal of the geological activities an Solar System.         Formation, evolution, internal structure and surface processes of planetary bodies; the terrestrial Venus, the Earth-Moon system, and Mars; the giant planets Jupiter, Saturn, Uranus, and N moons; Pluto, Charon and the Kuiper Belt; asteroids, meteorites, comets and the Oort cloud; C System.         On successful completion of this course, students should be able to:       • Describe the basic features of our Solar System and its constituents.         • Explain how this knowledge is acquired through observations and experiments.       • Demonstrate knowledge is acquired through observations and experiments.         • Demonstrate knowledge and understanding of the key geological, physical and chemical prothe structure, formation and evolution of planetary bodies.       E or above in AL Biol or Chem or Phys or Pure Math or Applied Math or Engineering Science         2nd sem       Examination         Y       24 hours of lectures, up to 24 hours of tutorials/practicals/seminars         One 2-hour written examination (50%); Coursework: Test (15%), Assignments (20%), Presentatic familiar and unfamiliar situations. Apply highly effective organizational and presen		

EASC2004 Geophys	sics (6 credits)	Academic Year	2012					
Offering Department	Earth Sciences	Quota						
Course Co-ordinator	Prof L S Chan, Earth Sciences							
Course Aim	An overview of the geophysical characteristics and processes of as well as the methodologies for studying geophysical data.	the solid earth, the atmospher	e and the ocear					
Course Contents	Introduction to Geophysics and Global Tectonics, Geomagnetic I Earthquakes and earthquake measurements, Elastic Waves Tectonics, Reflection Seismology, Gravity of the Earth Gravity Anomalies and Isostasy, Thermal Properties of the Ear Methods, Mantle and Mantle Processes, Core and Core Processe	Theory and Density models	, Seismicity ar					
Learning Outcomes	On successful completion of this course, students should be able - Describe the approaches and methods geophysicists used to str - Apply basic techniques in measurements of earthquakes and im - Determine plate motion rates and understand the methods of pa - Describe how density, pressure and temperature of the earth is	udy the interior of the earth terpret a seismogram aleomagnetism						
Pre-requisites	Pass in EASC0116 or EASC0118							
Offer in 2012 - 2013	2nd sem	Examination	Мау					
Offer in 2013 - 2014	Y							
Teaching Hours	24 hours of lectures, up to 12 hours of labs and projects							
Assessment Method	One 2-hour written exam (50% weighting); practical reports (30%); interim assessment quizzes (20%)							
Course Grade	A+ to F							

	B C D	Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.           Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.           Demonstrate general but incomplete command of knowledge and skills required for 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.
Textbooks	To bo pr	problems. Organization and presentational skills are minimally effective or ineffective.

EASC2005 Meteorol	ogy (6 cred	lits)	Academic Year	2012				
Offering Department	Earth Scier	Earth Sciences Quota						
Course Co-ordinator	Dr Z Liu, E	Dr Z Liu, Earth Sciences						
Course Aim		e is a survey of the Earth's atmospheric structure and behavior, nd weather systems.	instrument of obse	rvation, weather				
Course Contents	and precip	dget and radiative forcing, Adiabatic cooling and lapse rate, Moist itation, Coriolis effects and pressure system, Air masses and e, and Weather forecasting.						
Learning Outcomes	- Define ba - Recognis - Explain sy	n successful completion of this course, students should be able to: Define basic weather elements (temperature, humidity, winds etc.) Recognise basic atmospheric processes (clouds, air masses, fronts and precipitation etc.) Explain synoptic charts (weather maps) nterpret HK weather (typhoons etc.)						
Pre-requisites	Pass in PH	YS0610 or PHYS0629						
Offer in 2012 - 2013	1st sem		Examination	Dec				
Offer in 2013 - 2014	Y							
Teaching Hours	24 hours of	24 hours of lectures, 12 hours of practical and project						
Assessment Method	One 2-hou	r written exam (50%), project (25%), assignment (25%).						
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. 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	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.						
	C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the c outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply know familiar situations. Demonstrate mostly correct but some erroneous use of data and results to draw appropriar Show use of relevant information from sources and ability to make comparisons between different interpreduct/reference aptly.							
	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.							
Textbooks		Ahrens, Meteorology Today, An Introduction to Weather, Climate Brooks/Cole, 2008).	and the Environme	nt (Ninth edition,				

EASC2108 Structura	Academic Year	2012				
Offering Department	Earth Sciences	Quota	40			
Course Co-ordinator	Dr J R Ali, Earth Sciences					
Course Aim	The course covers the mechanical properties of rocks and how they are deformed, geological maps and their use in interpreting structure.					
Course Contents	Stress-strain relationships; use of Mohr Circles, earthquakes, big faults, fault rocks; thrusts; folds; textures, kinematic indicators and strain analysis; Shear zones; extensional faulting - wilder concepts - basins; strike-slip faults; joints; deformation mechanisms. Practical classes will look at the use of stereonets; theoretical maps, real					

	maps and	in introduction to stereograms. The	hese sessions will be both quant	itative and descripti	ve.	
Learning Outcomes	- Understa - Understa - Read a g	ful completion of this course, stud d how and why rocks deform. d the terminology and nomenclatu ological map and write an associa d the key structural geological fea	ure appropriate to Structural Ge ated summary.		and field studies.	
Pre-requisites	Pass in E	SC0116 or EASC0118				
Offer in 2012 - 2013	2nd sem			Examination	Мау	
Offer in 2013 - 2014	Y					
Teaching Hours	10 lecture	six 2-hour laboratory sessions/fiv	ve 1-day field classes in Hong Ko	ong		
Assessment Method	One 2-ho	written examination (50% weighti	ing), a fieldwork and coursework	assessment (50%	weighting)	
Course Grade	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	B Substantial grasp of the subject; evidence of critical abilities and logical thinking; apply knowledge to familiar and some unfamiliar situations; effective fieldwork skills and techniques; correct use of data and results to draw appropriate conclusions; general integration of theories, principles, evidence and techniques.				
	С	General but incomplete grasp of the sub familiar situations; moderately effective results to draw appropriate conclusions;	fieldwork skills and techniques; mostly	correct but some erron	eous use of data and	
	D	Limited grasp of the subject, retention or ability to apply knowledge to solve probl results to draw appropriate conclusions;	lems; partially effective fieldwork skills	and techniques; limited a	bility to use data and	
	Fail	Little or no grasp of the knowledge and thinking; very little or no ability to apply techniques; misuse of data and results theories, principles, evidence and technic	/ knowledge to solve problems; minima s and/or unable to draw appropriate c	ally effective or ineffectiv	e fieldwork skills and	
Textbooks	Davis, G. Van der I	: Foundations of Structural Geolog . & Reynolds, S. J. 1996: Structur uijm, B. A., and Marshak, S.: Ea Graw-Hill, 1997)	al Geology of Rocks and Region			

EASC2109 Igneous	and metam	orphic petrology (6 credits)	Academic Year	2012				
Offering Department	Earth Scie	ces	Quota	30				
Course Co-ordinator	Prof M Sur	Earth Sciences						
Course Aim		a comprehensive coverage of the principles ic rocks and rock-forming processes.	and techniques used in the study	/ of igneous and				
Course Contents	metamorph	Petrogenesis; magmas and magmatic differentiation; igneous petrography; intrusive and extrusive suites; types o metamorphism; metamorphic zones and facies; metamorphic processes and reactions; metamorphic petrography metamorphism in different tectonic settings; metamorphic P-T paths and their tectonic implications.						
Learning Outcomes	<ul> <li>Identify r</li> <li>under micr</li> <li>Demonst</li> </ul>	ful completion of this course, students should be ajor igneous and metamorphic rocks and their scope; and ate knowledge and understanding of magmatic a s with tectonic settings and crustal evolution.	textures and structures in both har	•				
Pre-requisites	Pass in EA	SC0116 or EASC0118						
Offer in 2012 - 2013	2nd sem		Examination	Мау				
Offer in 2013 - 2014	Y							
Teaching Hours	24 hours o	in-class instruction, up to 36 hours of laboratory	/field work					
Assessment Method	One 2-hou	written examination (75% weighting) and course	ework assessment (25% weighting)					
Course Grade	A+ to F							
Grade Descriptors	A	Demonstrate extensive knowledge and skills at an advar Show strong analytical and critical abilities and logical thin solve problems. Critical use of data and results to dra organizational and presentational skills.	king, and ability to apply highly effective lab s	kills and techniques to				
	В	Demonstrate substantial command of a broad range of kn learning outcomes. Show evidence of analytical and critica and techniques to solve problems. Correct use of da organizational and presentational skills.	al abilities and logical thinking, and ability to a	oply effective lab skill				
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course l						
	D	Demonstrate partial but limited command of knowledge an Show evidence of some coherent and logical thinking, but partially effective lab skills and techniques to solve prob conclusions. Apply limited or barely effective organizational	with limited analytical and critical abilities, and lems. Limited ability to use data and results	limited ability to appl				
	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.
Textbooks	M.G. Best: Igneous and Metamorphic Petrology (Oxford Blackwell Science, 2003, 2nd ed.)
References	John D Winter: An Introduction to Igneous and Metamorphic Petrology (Prentice Hall, 2001)

EASC2112 Earth sys	stems (6 c	credits)			Academic Year	2012	
Offering Department	Earth Sci	ciences			Quota		
Course Co-ordinator	Prof J G	Malpas,	Earth Sciences				
Course Aim	the Earth global iss	th System ssues fac	nts who have a fundamental backgroun and the interplay between its compoing earth scientists, changes in the na e exploitation and preservation of the pla	nent parts, in order tural environment, a	that they might ap	preciate some of	
Course Contents	System,	particula	stem Science?; the importance of inte rly the atmosphere, biosphere and hydi ter and air quality; energy and waste; so	osphere; biogeoche	mical cycles; globa		
Learning Outcomes	- Underst - Demons - Comme - Identify	stand the instrate an ent on the y and ra	npletion of this course, students should mportance of interfaces between comportance of the natural and anthroportance of the natural and anthroportal geological problems that face earth scitionalize issues associated with poort iscussion, and presentations etc	onents of the Earth S ogenic factors that ca entists in resource a	ause global environ	ent	
Pre-requisites	Pass in E	EASC011	8 or EASC0116 or EASC0105				
Offer in 2012 - 2013	1st sem				Examination	Dec	
Offer in 2013 - 2014	Y						
Teaching Hours	Up to 48	3 hours of	lectures, project work, debate and pane	l discussions, site vi	sits		
Assessment Method		One 2-hour written examination (30% weighting) and coursework assessment including problem based learning sessions (70% weighting)					
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. Show an outstanding ability to lead others within a research team.						
	В	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. Show the ability to take a major role within a research team.					
	с	the co moder draw a differe	udent should have a general command of the knu urse outcomes, and a general grasp of the sub ately effective organizational and presentational s ppropriate conclusions, should be able to use releant interpretations, through partial integration of the tively within a research team.	ject. Show some eviden kills. The student should want information from sou	ce of critical ability and be moderately effective irces and able to make of	logical thinking and in the use of data to comparisons between	
	D	numbe and c and re	udent should have a partial but limited command r of the course learning outcomes, and a limited itical thinking and at least marginally effective or sults to draw appropriate conclusions and use and is and comparison. To provide a minimum of inpu	grasp of the subject. Sh ganizational and presenta reference a variety of so	ow evidence of some a ational skills. Have limite purces mainly in summar	nalytical competence ed ability to use data	
	Fail	outcor little a Shows	udent shows little or no evidence of knowledge nes, lacks an overall grasp of the subject area an olitity to a apply knowledge to solve problems an little evidence of the integration of theories, princ to team environment.	d shows an absence of a nd has poor and ineffect	nalytical and critical thir ive presentation and/or	king abilities. Shows organizational skills.	

EASC2113 Sedimen	tology (6 credits)	Academic Year	2012
Offering Department	Earth Sciences	Quota	
Course Co-ordinator	Dr S C Chang, Earth Sciences		
Course Aim	The course deals with sedimentary rocks and processes, and the depositi accumulate.	onal environments i	n which sediments
Course Contents	Physical properties of sediments; processes of weathering, transportatio carbonates, siliclastic sediments, and sandstone petrography; sedimentation and tectonics.		
Learning Outcomes	On successful completion of this course, students should be able to: - Describe the physical properties of sediments and sedimentary rocks - Contrast the processes involved in sediment transportation and deposition - Interpret ancient rock associations in terms of their depositional environme		setting
Pre-requisites	Pass in EASC0105 or EASC0116 or EASC0118		
Offer in 2012 - 2013	2nd sem	Examination	May
		1	1

Offer in 2013 - 2014	Y	
Teaching Hours	2 lectures	per week and 24 hours of laboratory/field work
Assessment Method	Grades w (20%).	vill be based on midterm exam (30%), final exam (40%), one group presentation (10%) and lab reports
Course Grade	A+ to F	
Grade Descriptors	A	Demonstrate thorough grasp of the subject. Show strong analytical abilities and logical thinking, with evidence of original thought. Apply highly effective lab/fieldwork skills and techniques. Apply highly effective organizational and presentational skills.
	В	Demonstrate substantial grasp of the subject. Show strong analytical abilities and logical thinking. Apply effective lab/fieldwork skills and techniques. Apply highly effective organizational and presentational skills.
	С	Demonstrate general but incomplete grasp of the subject. Show some analytical abilities and logical thinking. Apply moderately effective lab/fieldwork skills and techniques. Apply moderately effective organizational and presentational skills.
	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.
Textbooks	Sediment	ology and Stratigraphy (Second Edition), Gary Nichols

EASC2124 Geologic	-				,			
Offering Department	Earth Sci	cience	ces				Quota	
Course Co-ordinator	Dr P Back	ich, Ea	Earth Science	es				
Course Aim	technique	This course is a hands-on field and class-based course that introduces basic geological field and mapping echniques and the use of geological equipment and air photographs as well as presenting an overview of the geology of Hong Kong.						
Course Contents	Maps and construct	The course will introduce the following topics: Maps and map reading, map reference system, interpretation and use of air photographs and geological maps construction of topographic and geological cross-sections; geological field techniques and equipment, field observation and description of rocks and outcrops.						
Learning Outcomes	<ul> <li>read and rocks and</li> <li>demons</li> <li>Create a</li> </ul>	nd co nd stru nstrate e and i	omprehend a ructures. te technique l interpret an	a geological n s for basic fiel internally cor	e, students should nap and construct a d observations, me sistent geological n al field data in deter	e geological cross s asurements and iden ap from a set of co	entifications. ollected field observ	ations and data.
Pre-requisites	Pass in E	EASC	C0118 or EA	SC0105 or E	ASC0116			
Offer in 2012 - 2013	2nd sem	n					Examination	No Exam
Offer in 2013 - 2014	Y							
Teaching Hours				hours of prac urday) in Hon	tical work, a compu g Kong.	llsory 5-day field ca	amp during the Rea	ding week and a
Assessment Method					n of geological fiel 10% weighting)	d reports (70% w	veighting); one cla	ssroom test (20%
Course Grade	A+ to F							
Grade Descriptors	A	to s	to record obser strong indeper	vations on earth dent analytical,	plete grasp of the subje processes in the field ar critical and logical thin geological map with high	nd to apply knowledge to king. Show strong abi	o familiar and unfamiliar lity to synthesize all ot	situations. Evidence of servations made and
	В	B Demonstrate substantial grasp of the subject required for most of the learning outcome. Shows evidence of ability to record observations on earth processes in the field and to apply knowledge to familiar and some unfamiliar situations. Evidence of independent analytical, critical and logical thinking. Shows ability to synthesize all observations made and knowledge in a field report and geological map with effective organizational and presentational skills.						
	С	re ir	record observa independent ar	itions on earth p nalytical, critical a	blete grasp of the subjec processes in the field a and logical thinking. Sho with moderately effective	and apply knowledge to by ability to synthesize	o most familiar situation most observations mad	ns. Evidence of some
	D	re C O	record observa coherent and	tions on earth pr logical thinking,	grasp of the subject rec ocesses in the field and but with limited analyt dge in a field report and	limited application of kr ical and critical abilitie	nowledge to solve proble es. Show limited ability	ems. Evidence of some to synthesize some
	Fail	0	observations of of little or lack	n earth processe of analytical and	f the subject required for s in the field and show v d critical abilities, coher dge in a field report and	very little or no ability to ent and logical thinking	apply knowledge to sol . Shows very little or r	ve problems. Evidence o ability to synthesize
Textbooks				Notes provide ogical Mappir	d. ng (Wiley, 1995, 3rd	l edition)		

EASC2125 Global te	ctonics (6 credits)	Academic Year	2012
Offering Department	Earth Sciences	Quota	

Course Co-ordinator	Prof J G M	alpas, Earth Sciences			
Course Aim		e students with an understanding of the driving forces of Earth pesses through an examination of direct and indirect observatio king.			
Course Contents	structural p subduction	ces of Earth processes; methods of investigation of large scale s properties of the planet; isostasy; continental drift; sea floor spre zones; mountain belts and orogenesis; formation of continental edimentary basins	ading; ocean ridges	; transform faults;	
Learning Outcomes	<ul> <li>Have an a</li> <li>Understate</li> <li>Appreciate</li> <li>Distill of a</li> </ul>	sful completion of this course, students should be able to: appreciation of the Earth as a dynamic planet nd how energy release within the Earth is translated into geologica te the importance of a knowledge of the history of investigation of a wide range of data to differentiate competing geological theories concise written and oral summaries of literature research on speci	global scale tectonic	•	
Pre-requisites	Pass in EA	SC0118 or EASC0105 or EASC0116			
Offer in 2012 - 2013	2nd sem		Examination	May	
Offer in 2013 - 2014	Υ				
Teaching Hours	Up to 48 he	ours of instruction including lectures, class seminars, class debate	es, essay presentatio	n	
Assessment Method	One 2-hou (70% weig	rr written examination (30% weighting) and coursework assess hting)	ment including essa	ays and seminars	
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	The student should show a substantial knowledge of a significant range of the the course outcomes, and have a substantial grasp of the subject. Show evide effective organizational and presentational skills and make critical use of releva the ability to make comparisons between consequent interpretations. Be caprinciples and evidence.	ence of the ability to think ant information from diffe	critically and to have rent sources, showing	
	с	The student should have a general command of the knowledge, competencies the course outcomes, and a general grasp of the subject. Show some evide moderately effective organizational and presentational skills. The student shoul draw appropriate conclusions, should be able to use relevant information from s different interpretations, through partial integration of theories, principles and evident of the student should be approximated and presentational skills.	ence of critical ability and Id be moderately effective ources and able to make	d logical thinking and e in the use of data to	
	D The student should have a partial but limited command of the knowledge, competencies and skills necessary for attaining a number of the course learning outcomes, and a limited grasp of the subject. Show evidence of some analytical competence and critical thinking and at least marginally effective organizational and presentational skills. Have limited ability to use data and results to draw appropriate conclusions and use and reference a variety of sources mainly in summary rather than through analysis and comparison.				
	D				
	Fail	and results to draw appropriate conclusions and use and reference a variety of	sources mainly in summa attaining even the minor f analytical and critical thi	ity of course learning nking abilities. Shows	

EASC2120 Milleralo	gy and geo	chemistry (6 credits) Academic Year	2012
Offering Department	Earth Scier	nces Quota	30
Course Co-ordinator	Prof M Sun	, Earth Sciences	
Course Aim	the petrogr	the fundamentals and principles of geochemistry and mineralogy. It gives the bas aphy of igneous, sedimentary and metamorphic rocks. To introduce geochemical ents and isotopes.	
Course Contents	forming mi	nd optical properties of minerals; mineral structure; polarising microscope; characte nerals, trace elements; radiogenic and stable isotopes; low temperature geocl on of the earth; isotope geochemistry.	
Learning Outcomes	- understar forming mir	sful completion of this course, students should be able to: ad basic knowledge of mineralogy and geochemistry, including the methodology unerals according to their physical and optical properties,	sed to identify roc
	- understar	d mineral structure and crystallization. d the principles for trace element geochemistry and isotope geology and the a nd isotopic ratios in tracing source and timing of geological processes.	oplications of trac
Pre-requisites	<ul> <li>understar</li> <li>elements a</li> </ul>	nd the principles for trace element geochemistry and isotope geology and the a	oplications of trace
•	<ul> <li>understar</li> <li>elements a</li> </ul>	nd the principles for trace element geochemistry and isotope geology and the a nd isotopic ratios in tracing source and timing of geological processes.	Dec
Offer in 2012 - 2013	- understar elements a Pass in EA	nd the principles for trace element geochemistry and isotope geology and the a nd isotopic ratios in tracing source and timing of geological processes. SC0118 or EASC0105 or EASC0116	•
Offer in 2012 - 2013 Offer in 2013 - 2014	<ul> <li>- understar elements a</li> <li>Pass in EA</li> <li>1st sem</li> <li>Y</li> </ul>	nd the principles for trace element geochemistry and isotope geology and the a nd isotopic ratios in tracing source and timing of geological processes. SC0118 or EASC0105 or EASC0116	•
Offer in 2012 - 2013 Offer in 2013 - 2014 Teaching Hours	<ul> <li>- understar elements a</li> <li>Pass in EA</li> <li>1st sem</li> <li>Y</li> <li>24 hours of</li> </ul>	nd the principles for trace element geochemistry and isotope geology and the a nd isotopic ratios in tracing source and timing of geological processes. SC0118 or EASC0105 or EASC0116 Examination	•
Pre-requisites Offer in 2012 - 2013 Offer in 2013 - 2014 Teaching Hours Assessment Method Course Grade	<ul> <li>- understar elements a</li> <li>Pass in EA</li> <li>1st sem</li> <li>Y</li> <li>24 hours of</li> </ul>	in-class instruction; up to 36 hours of practical work	•

Textbooks	W.D. Ne	and C.S. Hurlbat: Manual of Mineralogy (Wiley, 1999, 1st ed.) esse: Introduction to Optical Mineralogy (Oxford University Press, 1998, 2nd ed). e: Principles and Applications of Geochemistry (Prentice Hall, 1998, 2nd ed).
	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.
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities, and limited ability to apply partially effective lab skills and techniques to solve problems. Limited ability to use data and results to draw appropriate conclusions. Apply limited or barely effective organizational and presentational skills.
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply moderately effective lab skills and techniques to solve problems. Mostly correct but some erroneous use of data and results to draw appropriate conclusions. Apply moderately effective organizational and presentational skills.
	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.
		organizational and presentational skills.

EASC2127 Global cl	hange: ant	hropogenic impa	ct (6 credits)	Academic Year	2012		
Offering Department	Earth Scie	nces		Quota			
Course Co-ordinator	Dr Z Liu, E	Dr Z Liu, Earth Sciences					
Course Aim		This course will explore the role of humans in global change and the environmental responses to such changes. Causes and impacts of climate change will be discussed.					
Course Contents	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					
Learning Outcomes	- Recognis - Recognis - Identify n	In successful completion of this course, students should be able to: Recognise the complexity of global climate systems Recognise the controversy of anthropogenic global warming Identify modern environmental issues Assess the credibility of various scientific arguments					
Pre-requisites	Pass in EA	SC0121 or EASC01	05 or EASC0118				
Offer in 2012 - 2013	1st sem			Examination	Dec		
Offer in 2013 - 2014	Ν						
Teaching Hours	24 hours o	of lectures, up to 24 h	ours of labs, group discussion and c	lass debate.			
Assessment Method	One 2-hou	ir written examinatior	(50% weighting) and coursework a	ssessment (50% weighting).			
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. 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.						
	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.						
	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.						
	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.						
Textbooks	John Houg	ghton, Global Warmir	ng, The Complete Briefing, Third Edi	ion (Cambridge University F	Press, 2004)		
References	IPCC web	site: http://www.ipcc.o	ch/ipccreports/assessments-reports.	htm			
Remarks	Offered ev	ery other year					

EASC2131 A cool w	orld: ice ages and climate change (6 credits)	Academic Year	2012		
Offering Department	Earth Sciences	Quota			
Course Co-ordinator	Dr S H Li, Earth Sciences				
Course Aim	This course set out to provide students with an understanding of how dynam	ics Earth is and how	v it has changed		

	over the pa	ast 2.5 million years.				
Course Contents	The Quaternary Period comprises the last 2.6 million years of Earth history, an interval dominated by climate fluctuations and the waxing and waning of large northern hemisphere ice sheets. This course will cover the many types of geologic evidence, from glacial geomorphology to deep-sea geochemistry, that are used to reconstruct ocean and atmospheric conditions (e.g., temperature) through the Quaternary. We will also consider recent non-glacial deposits and landforms, including coastal features, but the general emphasis is on how the landscape has evolved within the context of Late Quaternary climate variability.					
Learning Outcomes	- understa - learn the	On successful completion of this course, students should be able to: - understand the earth climate change during the last 2.6 million years, - learn the methods of palaeo-environment reconstruction, - understand the impacts of past climate changes				
Pre-requisites	Pass in EA	ASC0118 or EASC0121				
Offer in 2012 - 2013	2nd sem		Examination	May		
Offer in 2013 - 2014	Y					
Teaching Hours	24 hours of	f lectures, up to 24 hours of labs, group discussion and class deba	ate			
Assessment Method	One 2-hou	r written examination (50%); Project, fieldtrip and practical reports	(50%)			
Course Grade	A+ to F					
Grade Descriptors	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.					
	В	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.				
	C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.					
	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.					
	Fail 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.					
References		W F Ruddiman: Earth's Climate: Past and Future (Freeman, 2008, 2nd edition) D E Anderson, A S Goudie and A G Parker: Global Environments through the Quaternary (Oxford, 2007)				
Remarks	Offered ev	ery other year				

EASC2201 Hydroge	ology (6 cr	edits)	Academic Year	2012
Offering Department	Earth Scier	nces	Quota	40
Course Co-ordinator	Prof J J Jia	o, Earth Sciences		
Course Aim	To study t importance	he role of ground water in subsurface geological proce	ess and its environmenta	l and geotechnica
Course Contents	groundwate	logic cycle; physical properties of aquifer; groundwate er geology; groundwater and environmental management; al and environmental problem.		
Learning Outcomes	<ul> <li>Appreciat</li> <li>Understa</li> <li>surface wa</li> <li>Appreciat</li> <li>Understa</li> <li>groundwate</li> </ul>	e the close relationship between groundwater system and nd basic concepts of aquifer and aquifer properties, hyd	ce, and interaction betwee geology and topography raulic head, flow net, and	0
Pre-requisites	Pass in EA	SC0116 or EASC0118		
Offer in 2012 - 2013	1st sem		Examination	Dec
Offer in 2013 - 2014	Y			
Teaching Hours	2 lectures	per week for 12 weeks; 24 hours of laboratory/field work		
Assessment Method	One 2-hou (30%)	r written exam (70% weighting) and coursework (assignment)	ents, laboratory experimer	its and field testing
Course Grade	A+ to F			
Course Grade Grade Descriptors	A+ to F	Demonstrate thorough mastery at an advanced level of extensive kn learning outcomes. Show strong analytical and critical abilities and logi to apply knowledge to a wide range of complex practical problems. skills.	cal thinking, with evidence of original	inal thought, and ability
		learning outcomes. Show strong analytical and critical abilities and logi to apply knowledge to a wide range of complex practical problems.	cal thinking, with evidence of orig Apply highly effective organization d skills required for attaining at I d logical thinking, and ability to a	pinal thought, and ability onal and presentational east most of the course

	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 practical 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 practical problems. Organization and presentational skills are minimally effective or ineffective.	
Textbooks	C. W. Fette	r: Applied Hydrogeology (Prentice-Hall, 2001, 4th ed.)	

EASC2301 Field can	nps (6 cre	lits)		Academic Year	2012		
Offering Department	Earth Sci	nces		Quota			
Course Co-ordinator	Prof J G Malpas, Earth Sciences						
Course Aim	technique	The aims of a geological field camp are to provide 1) essential training and experience in geological mapping techniques and 2) opportunities to study at first-hand areas of particular geological interest and importance, especially outside Hong Kong.					
Course Contents	form of 1 Kong. St	There are normally two field camps: one at the end of first year and one at the end of second year. These take the form of 10 days - 3 weeks residential camps in China or overseas, or in exceptional circumstances, in Hong Kong. Students will visit areas displaying exceptional geology and will undertake independent and group mapping and problem solving exercises.					
Learning Outcomes	<ul> <li>Have ar</li> <li>Recogn</li> <li>Appreciance</li> <li>Be com</li> <li>Construction</li> <li>relevant of</li> </ul>	te a variety of rock types and the te various environmental aspect etent in maintaining a field note of a geological map based upo poservations	rtance of field studies to the Ear eir relationships with one anothe	er in any given field site vations and inferences ral relationships, relati			
Pre-requisites	Pass in a	least 42 credits of EASC course	₽S.				
Offer in 2012 - 2013	2nd sem			Examination	No Exam		
Offer in 2013 - 2014	Y						
Teaching Hours			group teaching in the field with e a period of independent field r				
Assessment Method	Coursew	rk assessment. A field report an	d/or completion of field assignm	nents will be required for	or all field camps.		
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.						
	B Demonstrate substantial grasp of the subject. Evidence of analytical and critical abilities and logical thinking. Apply effective fieldwork skills and techniques. Correct use of data of results to draw appropriate conclusions. Apply effective organizational and presentational skills.						
	C Demonstrate general but incomplete grasp of the subject. Evidence of some analytical and critical abilities and logical thinking. Apply moderately effective fieldwork skills and techniques. Mostly correct but some erroneous use of data and results to draw appropriate conclusions. Apply moderately effective organizational and presentational skills.						
	Demonstrate partial but limited grasp, with retention of some relevant information, of the subject. Evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Apply partially effective fieldwork skills and techniques. Limited ability to use data and results to draw appropriate conclusions. Apply limited or barely effective organizational and presentational skills.						
	Fail Demonstrate evidence of little or no grasp of the knowledge and understanding of the subject. Evidence of little or lack of 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.						
	Fail	analytical and critical abilities, logic techniques. Misuse of data and resu	cal and coherent thinking. Apply mini lts and/or unable to draw appropriate of	mally effective or ineffectiv	e fieldwork skills and		

EASC2307 Directed	studies in earth sciences (6 credits)	Academic Year	2012		
Offering Department	Earth Sciences	Quota			
Course Co-ordinator	Prof M Sun, Earth Sciences				
Course Aim	To enhance the student's knowledge of a particular topic and the studen thinking skills.	nt's self-directed lea	arning and critical		
Course Contents	The student undertakes a self-managed study on a topic in earth sciences under the supervision of a staff member. The topic is preferably one not sufficiently covered in the regular curriculum. The directed study can be a critical review or a synthesis of published work on the subject, or a laboratory or field study that would enhance the student's understanding of the subject. The project may not require an element of originality.				
Learning Outcomes	On successful completion of this course, students should be able to: - enhance the ability in self-learning, data-collection and analysis, critical th earth sciences, - write scientific dissertation, and conduct oral presentation of the research re		endent research in		
Pre-requisites	Pass in at least 18 credits of EASC0XXX level or EASC1XXX level courses;	and GPA of 2.5 or a	bove.		
Offer in 2012 - 2013	Year long	Examination	No Exam		
Offer in 2013 - 2014	Y				

Teaching Hours	No formal teaching; meetings to be arranged by the student and the supervisor. The student is expected to spend at least 50 hours on the project.				
Assessment Method	Coursework (100%) in the form of a report with 6000-8000 words (exclusive of figures and references) and an oral presentation.				
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 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.]				
	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 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 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.				
Remarks	Consent of Major Coordinator is required for this course.				

EASC3132 Earth res	sources (6	credits)				Academic Year	2012
Offering Department	Earth Scie	ences				Quota	40
Course Co-ordinator	Prof M F Z	Prof M F Zhou, Earth Sciences					
Course Aim	understand	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.					
Course Contents	deposit, m	mineral de	posit models, ma	ning industrial; exp gmatic oxide and coal, oil and gas, re	sulfide deposits,	skarn deposits, po	
Learning Outcomes	<ul> <li>understar</li> <li>understar</li> <li>understar</li> </ul>	On successful completion of this course, students should be able to: understand the terminology and nomenclature in the mining industrial and mineral deposits understand factors that are key to the formation of metallic and industrial resources understand the controls of earth resources in a global scale understand methods of exploration and exploitation for mineral deposits					
Pre-requisites	Pass in EA	ASC0116 c	or EASC0118				
Offer in 2012 - 2013	1st sem					Examination	Dec
Offer in 2013 - 2014	Y						
Teaching Hours	2 lectures	s per week	for 10 weeks; 20 h	ours of laboratory +	1 overseas camp		
Assessment Method	One 2-hou weighting)		examination (50%	weighting), lab pr	acticals (20% wei	ghting) and overse	a field trip (30%
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.						
	В	B Demonstrate substantial understanding at an advanced level of extensive knowledge and skills with evidence for attaining all the course learning outcomes. Show analytical and critical abilities and logical thinking. Evidence 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.					
	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.						
Textbooks	To be pres	scribed					

EASC3133 Applied	geochemistry (6 credits)	Academic Year	2012		
Offering Department	Earth Sciences	Quota 50			
Course Co-ordinator	Dr K H Lemke, Earth Sciences				
Course Aim	To present key concepts of geochemistry and their application to environmental and Earth science problems.				

Course Contents	High temperature/pressure geochemistry, thermodynamics and kinetics of hydrothermal and geothermal systems, inorganic and organic geochemistry and the chemical interaction of minerals and aqueous inorganic, organic, and biochemical species in geochemical processes.					
Learning Outcomes	<ul> <li>understa conditions</li> <li>-demonstr</li> <li>-explain p and depos</li> <li>-understar</li> <li>- understar</li> </ul>	ssful completion of this course, students should be able to: nd how thermodynamic principles are applied to problems in aqueous syst ate knowledge of concepts and ideas of aqueous solutions. rinciples of ion pairing, complex formation and mineral solubility and their sition during ore genesis. Ind how thermodynamic properties are applied to construct phase diagrams. Ind how experimental and theoretical methods are applied to gain insight in sciences and how these relate to observable properties of solids, fluids and	relevance	in metal transport		
Pre-requisites	Pass in E	ASC2126				
Offer in 2012 - 2013	1st sem	Exam	ination	Dec		
Offer in 2013 - 2014	Y					
Teaching Hours	24 hours of	f lectures, up to 24 hours of labs, group discussions and seminars				
Assessment Method		One 2-hour written examination (40% weighting) and coursework assessment: 2 midterms and student seminars (60% weighting)				
Course Grade	A+ to F					
Grade Descriptors	A	Student demonstrates thorough mastery at an advanced level of extensive knowledge and skills required for attaining all course learning outcomes. Shows strong analytical and critical abilities and logical thinking, with evidence of original thought, and the ability to apply his/her knowledge to a wide range of problems in geochemistry, and at the same, can combine fundamental knowledge in geochemistry to understand the interactions among minerals, fluids and gases and how these processes impact fluxes of materials over geological time periods and on a global scale. Student shows the ability to apply highly effective organizat-ional and presentational skills.				
	в	Student demonstrates substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and apply his/her knowledge to a range of problems in geochemistry, and at the same combine knowledge in geochemistry to understand material fluxes among minerals, fluids and gases over geological time periods and on a global scale. Student shows the ability to apply effective organizational and presentational skills.				
	С	Student demonstrates general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply his/her knowledge to a range of problems in geochemistry and how interactions among minerals, fluids and gases impact material fluxes on a global scale. Student shows the ability to apply moderately effective organizational and presentational skills.				
	D	Student demonstrates partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to understand key topics in geochemistry and limited capability to transfer this knowledge to geological phenomena. Student shows the ability to apply limited or barely effective organizational and presentational skills.				
	Fail	ail Student demonstrates little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Shows very little or no ability to apply knowledge to understand basic topics related to the geochemistry and the application of these principles to geological problems. Organization and presentational skills are minimally effective or ineffective.				
Textbooks		, H.L. Geochemistry of Hydrothermal Ore Deposits, (Wiley, 1997) W. Aquatic Chemistry, (Wiley, 1996)				

EASC3134 Regional	l geology (6 credits)	Academic Year	2012				
Offering Department	Earth Sciences Quota 40						
Course Co-ordinator	Dr J R Ali, Earth Sciences						
Course Aim	To examine the key events and phenomena associated with the the tector evolution of East-SE-South Asia, including that of Hong Kong.	nic					
Course Contents	The tools used in deciphering dispersion and amalgamation of crustal models for the East Asian blocks; Construction of East Asia/SE Asia; Ind effects; Mesozoic evolution of SE China, opening of the S China Sea; Ge structure and tectonic evolution); W Pacific marginal basins and Philippine Taiwan.	ia's collision with Euras ology of HK (stratigrapl	ia and its regionany, igneous rocks				
Learning Outcomes	On successful completion of this course, students should be able to: - Have an appreciation of the various "tools" that are a commonly used by of a tectonically complicated region. - Have an awareness of the influential (and in some cases conflicting) me how the collage of crustal elements that comprises East-SE-South Asia million years, and where the "pieces" may have originated. - Carry out an in-depth scientific review (in this case a key geological literature (particularly hot-of-the-press journal papers and/or chapters in both orally at a seminar, and as an academic paper.	odels that have been pr has been assembled issue associated with t	oposed to explai over the last 25 he region) of the				
Pre-requisites	Pass in EASC2108 and EASC2125						
Offer in 2012 - 2013	1st sem	Examination	Dec				
Offer in 2013 - 2014	Y						
Teaching Hours	2 lectures per week for 10 weeks; 36 hours of library study + individual top	pic work					
Assessment Method	One 2-hour written examination (50% weighting); coursework assessme research, an oral presentation (and related abstract) and a related essay		nsisting of librar				
Course Grade	A+ to F						
Grade Descriptors							

Textbooks	To be pre	escribed
	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.
	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.
	С	General but incomplete grasp of the subject; evidence of some critical abilities and logical thinking; moderately effective organizational and presentational skills; use of relevant information from sources, showing ability to make comparisons between different interpretations and to quote/reference aptly.
	В	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.
	А	presentational skills; insightful use and critical analysis / evaluation of information drawn from a full range of high quality sources and to quote/reference aptly.

EASC3202 Soil and	rock mec	chanic	cs (6 credi	ts)				Academic Year	2012
Offering Department	Earth Sci	Earth Sciences							40
Course Co-ordinator	Prof J J J	Jiao, E	Earth Science	s					
Course Aim			asic knowled geology/geot		nd rock mec	nanics for thos	e wishing t	o consider further	studies on a caree
Course Contents	strength a	and fai		initial stress				ls; pore pressure a on; consolidation; p	
Learning Outcomes	- Underst	stand ba stand ba	basic concept	s of stress a es and class	and strain, po sifications of		nd effective	stress, strength ar	nd failure criteria
Pre-requisites	Pass in E	EASC2	2201, or alrea	ady enrolled	in this cours	e			
Offer in 2012 - 2013	2nd sem	2nd sem						Examination	May
Offer in 2013 - 2014	Y	Y							
Teaching Hours	2 lectures	2 lectures per week for 12 weeks; 24 hours of laboratory/field work							
Assessment Method	One 2-ho	our writ	itten exam (7	0% weightin	ng) and cours	sework (assigr	ments and	laboratory experim	ients) (30%)
Course Grade	A+ to F								
Grade Descriptors	A	lear		. Show strong				and skills required for a king. Apply highly effec	
	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	oute		evidence of	some analytica			red for attaining most ogical thinking. Apply	
	D	Sho		some coheren	nt and logical th			taining some of the cou al and critical abilities.	
	Fail	Lac		and critical at				d for attaining the court ation and presentation	
Textbooks			oil Mechanics n: Introduction			d.) hn Wiley & So	ons, 1989)		

EASC3203 Engineer	ing geology (6 credits)	Academic Year	2012				
Offering Department	Earth Sciences Quota 40						
Course Co-ordinator	Prof J J Jiao, Earth Sciences						
Course Aim	To present some of the concepts and skills of importance in the profes their use by case histories.	sion of Engineering Geo	logy and illustrate				
Course Contents	Introduction to engineering design and the role of the Engineering Geol (air photo interpretation, soil and rock description, engineering foundations. Case histories from Hong Kong.						
Learning Outcomes	<ul> <li>On successful completion of this course, students should be able to:</li> <li>Appreciate how civil engineering design is carried out and understand projects, particularly the economic- and safety-critical duties.</li> <li>Make simple engineering-geological models and understand how desiground investigation design should be carried out.</li> <li>Carry out simple air photo interpretation tasks and elementary soil a engineering purposes.</li> <li>Understand major types of slope failures and basic methods to control</li> <li>Carry out stability analyses using methods such as the limit equilibrium</li> </ul>	sk study, site reconnais: and rock description and and mitigate landslides.	sance survey and				

Pre-requisites	Pass in E	ASC2201, or already enrolled in this course					
Offer in 2012 - 2013	2nd sem	2nd sem Examination May					
Offer in 2013 - 2014	Y						
Teaching Hours	2 lectures	per week for 12 weeks; 20 hours of laboratory/field w	ork				
Assessment Method	One 2-ho	ur written exam (60% weighting) and coursework (ass	ignment, field report) (40%)				
Course Grade	A+ to F						
Grade Descriptors	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attainin learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original the to apply knowledge and skills to solve a wide range of complex, familiar and unfamiliar practical problem 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 and skills to solve familiar and some unfamiliar practical problems. 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 and skills to solve most familiar, but not unfamiliar, practical problems. Apply moderately effective organizational and presentational skills.					
	D	Demonstrate partial but limited command of knowledge and ski Show evidence of some coherent and logical thinking, but wit apply knowledge and skills to solve familiar practical prot presentational skills.	h limited analytical and critical abilities.	Show limited ability to			
	Fail	Demonstrate little or no evidence of command of knowledge Lack of analytical and critical abilities, logical and coherent thin to practical problems. Organization and presentational skills are	king. Show very little or no ability to appl				
Textbooks	Goodman	n, R. E.: Engineering Geology (Wiley, 1993)					

EASC3308 Earth scie	ences proje	ect (12 credits)	Academic Year	2012				
Offering Department	Earth Scier	ices	Quota					
Course Co-ordinator	Prof M Sun	Prof M Sun, Earth Sciences						
Course Aim		e the student's knowledge, ability and interest in advanced stud with an opportunity to be engaged in an advanced research proj		nces by providing				
Course Contents	member. T and design	nt undertakes a research project in the form of a senior the The project could be based on a particular component of a staf ed by the student. The student must involve in the project in a n- ct formulation, data collection and analysis, and presentation. Th	f member's research on-trivial manner, and	or one proposed I play a major role				
Learning Outcomes	<ul> <li>acquire find</li> <li>under the s</li> <li>select rest</li> <li>thinking.</li> </ul>	In successful completion of this course, students should be able to: acquire first-hand research experience in earth sciences by doing an individual research project independently nder the supervision of a supervisor. select research topics, design research path, choose research technology, and more importantly use critical inking. enhance the ability in doing independent earth/environmental research with field/laboratory components.						
Pre-requisites	GPA of 3.0	east 18 credits of EASC2XXX level and EASC3XXX level course or above; and rth Sciences.	s; and					
Offer in 2012 - 2013	Year long		Examination	No Exam				
Offer in 2013 - 2014	Y	γ						
Teaching Hours		eaching; meetings to be arranged by student and supervisor. Th on the project.	e student is expected	to spend at least				
Assessment Method	Courseworl oral presen	k (100%) in the form of a report with 10000-15000 words (exclutation.	sive of figures and re	eferences) and an				
Course Grade	A+ to F							
Grade Descriptors	A	Demonstrate thorough grasp of the subject. Show strong analytical and critical original thought. Insightful use and critical analysis / evaluation of information and to quote/reference aptly. Critical use of first-hand data and results to dr Apply highly effective organizational and presentational skills. [Work of A+ s additional work beyond that is required in wider areas relevant to the topic.]	drawn from a full range of aw insightful conclusions	high quality sources and solve problems.				
	В	Demonstrate substantial grasp of the subject. Evidence of analytical and critic relevant information from sources, showing ability to make meaningful interpretations and to quote/reference aptly. Correct use of first-hand data of insightful conclusions and solve problems. Apply effective organizational and pu	comparisons between esults to draw appropriate	different secondary				
	С	Demonstrate general but incomplete grasp of the subject. Evidence of some analytical and critical abilities and creative						
	D	Demonstrate partial but limited grasp, with retention of some relevant informat and logical thinking, but with limited analytical and critical abilities. Demonstr mainly through summary rather than analysis and comparison. Limited abil appropriate conclusions. Apply limited or barely effective organizational and pre-	ate use and reference of ty to use first-hand data	several sources, but				
	Fail	Demonstrate evidence of little or no grasp of the knowledge and understand analytical and critical abilities, logical and coherent thinking. Limited use of se them. Misuse of first-hand data and results and/or unable to draw appropriat skills are minimally effective or ineffective.	condary sources and no	critical comparison of				
Remarks	Consent of	Major Coordinator is required for this course.						

EASC3988 Earth sci	iences inter	rnship (6 credits)	Academic Year	2012				
Offering Department	Earth Scier	nces	Quota					
Course Co-ordinator	Prof L S Cł	Prof L S Chan, Earth Sciences						
Course Aim	study. The gained in the	e aims to offer students the opportunities to gain work exper workplace learning experience would be of great benefit he study to the real work environments. Students have to ta n the University or outside the University arranged by the So	s to the students to appl ake on at least 160 hours	y their knowledge				
Course Contents	various tas (2) Outside will be supe Departmen	(1) Within the university: The student will be supervised by a staff member (Supervisor), working on a project of 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 studer will be supervised under a staff member of the external agency (the External Supervisor) and a staff member of th Department/School of the student (the Internal Supervisor). The work to be performed by the student will normal be instructed by the External Supervisor, with prior agreement of the Internal Supervisor.						
Learning Outcomes	- gain at lea - acquire a	sful completion of this course, students should be able to: ast 4 weeks of work experience in a geosciences-related firm n understanding and appreciation of the real work environme ne experience with applying learned knowledge to solving re	ent					
Pre-requisites	Students a	re expected to have satisfactorily completed their Year 2 stu	dy.					
Offer in 2012 - 2013	1st sem 2	1st sem 2nd sem Summer Examination No Exam						
Offer in 2013 - 2014	Y							
Teaching Hours	No formal t 20 working	eaching, but it is expected that students are to work at least days.	: 160 hours (lunch hour e:	cluded) in at leas				
Assessment Method	100% Inter	nship performance						
Course Grade	Pass/Fail							
Grade Descriptors	Pass	Demonstrate ability of applying knowledge to solve problems in the wor required in the job or assigned by supervisor(s). Establish effective or colleagues, and clients in the job. Successfully fulfill the requirements hours, written and oral report, and evaluation by supervisor(s), etc.	collaboration and communication	on with supervisor(s),				
	Fail	Demonstrate very limited or no ability of applying knowledge to solve pro work required in the job or assigned by supervisor(s). Fail to establish ef (s), other colleagues, or clients in the job. Fail to satisfy the requirement hours, written and oral report, or evaluation by supervisor(s), etc.	fective collaboration or commun	nication with superviso				
Remarks	who have of Satisfactory internship Students w Visit http://v Enrolment	re expected to have satisfactorily completed their Year 2 stu completed Year 1. y completion of this course can be counted towards the Ex- will be recorded on the student's transcript. This course tho are interested to enrol in this course should contact the D www.hku.hk/science/current/bsc/internship/ for more informa of this course is not conducted via the online course selecti epartment/School office after approval has been obtained fro	speriential Learning requi will be assessed on Pa Department to obtain the a tion. on system and should be	rement. Details c ass or Fail basis approval. made through th				

ENVS0001 Introduct	tion to environmental science (6 credits)	Academic Year	2012				
Offering Department	Earth Sciences Quota						
Course Co-ordinator	Dr Y Zong, Earth Sciences						
Course Aim	To provide students with an inter-disciplinary introduction to Environmental Science with key questions to highligh 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	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.						
Learning Outcomes	On successful completion of this course, students should be able to: - explain and describe connections between the physical and biological str impact of human society on the environment, - explain the concept of environmental sustainability, give examples of how sustainability and - compare different approaches to resolving specific problems presented in or	society can adapt be					
Pre-requisites	NIL						
Offer in 2012 - 2013	1st sem	Examination	Dec				
Offer in 2013 - 2014	Υ						
Teaching Hours	24 hours of lectures, up to 24 hours of group discussion and class deba	te. Field Trip: A one	e-day field trip to				

	introduce	e participants to environmental issues within Hong Kong.
Assessment Method	One 2-h	our written examination (50% weighting); course work assessment (50% weighting)
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 subject and an ability to apply knowledge to familiar and some unfamiliar situations. Show evidence of logical thinking abilities. Coursework completed on time and to a good academic 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.
Textbooks		iving in the Environment (Thomson, 2007, 15th ed.) nd Botkin: Essential Environmental Science (Wiley, 2008)

ENVS2004 Environn	nent and s	society	y (6 credits	5)			Academic Year	2012
Offering Department	Earth Scie	iences				Quota		
Course Co-ordinator	Dr Y Zong	Dr Y Zong, Earth Sciences						
Course Aim	examine t society ha have arise	the relation the relation the relation the relation the relation term in the relation the relationt the relation the relat	ationship bet racted with th n human exp	ween them. The natural enviro	e course emplorment in the province of the pro	nasizes knowledg bast and present, hment. Students v	e earth systems, ai e and understandir and the environmer vill explore ways hu	g of how human tal problems that
Course Contents	Interconne Use and m Urbanizati	The natural environment of East Asia Interconnections between human society and the environment Jse and misuse of natural resources, and consequences Jrbanization, economic growth and environmental degradation Sustainable natural resources management						
Learning Outcomes	<ul> <li>demonst society an</li> </ul>	strate ki nd the r tand the	nowledge an natural enviro	onment,	standing of the	e complexity and	interconnectedness ssible ways to ach	
Pre-requisites	Pass in EN	ENVS00	01 or EASC	0118				
Offer in 2012 - 2013	2nd sem	2nd sem Examination May						
Offer in 2013 - 2014	Y							
Teaching Hours	24 hours o	of lectu	ires, 8 hours	of group discus	sion, 4 hours o	f project tutorials		
Assessment Method	One 2-hou	our writte	en examinati	on (60% weighti	ng), project rep	oort (40% weightin	g)	
Course Grade	A+ to F							
Grade Descriptors	A	evide	ence of original		to apply knowled	lge to a wide range o	analytical, critical and f complex, familiar and	
	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	situat					ability to apply knowle by moderately effective	
	D	Show	w evidence of so		ogical thinking, bu		bility to apply knowledg I and critical abilities. Ap	
	Fail	probl		critical thinking abili			le or no ability to apply tion and presentational	
Textbooks	Kaufmann	in and C	Cleveland: En	vironmental Sci	ence (Àmazon	/iley & Sons, 2008 , 2008) imental Issues (Ar	,	
Remarks	Offered fro							

ENVS2007 Natural ha	Academic Year	2012				
Offering Department	Earth Sciences	Quota				
Course Co-ordinator	Dr Y Zong, Earth Sciences					
Course Aim	This course introduces students the mechanisms of major natural hazards in	cluding earthquake, s	storm and flood,			

Offer in 2013 - 2014       Y         Teaching Hours       24 hours of lectures, 8 hours of group discussion, 4 hours of project tutorials         Assessment Method       One 2-hour written examination (60% weighting), project report (40% weighting)         Course Grade       A+ to F         Grade Descriptors       A         B       Demonstrate thorough mastery of the course material. Show strong ability to apply knowledge to familiar and unfam Demonstrate highly effective organizational and presentational skills.         B       Demonstrate substantial command of the course material and an ability to apply knowledge to familiar and s situations. Show evidence of analytical, critical thought to some complex issues. Apply effective organ presentational skills.         C       Demonstrate general but incomplete command of the course material and an ability to apply knowledge to a situations. Show evidence of some critical and logical thinking abilities. Apply moderately effective organ presentational skills.						
- demonstrate knowledge and critical understanding of the key characteristics of major natural hazard aspects of the hazards, and technologies used to protect lives and properties.         Pre-requisites       Pass in ENVS0001 or EASC0118 or EASC0003         Offer in 2012 - 2013       1st sem       Examination       Detection         Offer in 2013 - 2014       Y       Teaching Hours       24 hours of lectures, 8 hours of group discussion, 4 hours of project tutorials       Examination       Detection         Assessment Method       One 2-hour written examination (60% weighting), project report (40% weighting)       Course Grade       A+ to F         Grade Descriptors       A       Demonstrate thorough mastery of the course material. Show strong ability for analytical, critical and logica evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfam Demonstrate highly effective organizational and presentational skills.         B       Demonstrate substantial command of the course material and an ability to apply knowledge to familiar and unfam Demonstrate substantial command of the course material and an ability to apply knowledge to report succes. Apply effective organizational skills.         C       Demonstrate general but incomplete command of the course material and an ability to apply knowledge to a situations. Show evidence of some critical and logical thinking abilities. Apply moderately effective organizational skills.						
Offer in 2012 - 2013       1st sem       Examination       December 2013         Offer in 2013 - 2014       Y       Teaching Hours       24 hours of lectures, 8 hours of group discussion, 4 hours of project tutorials       Seessment Method       One 2-hour written examination (60% weighting), project report (40% weighting)       Image: Course Grade       A+ to F         Grade Descriptors       A       Demonstrate thorough mastery of the course material. Show strong ability for analytical, critical and logica evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfam Demonstrate highly effective organizational and presentational skills.       B       Demonstrate substantial command of the course material and an ability to apply knowledge to familiar and situations. Show evidence of analytical, critical thought to some complex issues. Apply effective organ presentational skills.       Demonstrate general but incomplete command of the course material and an ability to apply knowledge to a situations. Show evidence of some critical and logical thinking abilities. Apply moderately effective organ presentational skills.	ds, the human					
Offer in 2013 - 2014       Y         Teaching Hours       24 hours of lectures, 8 hours of group discussion, 4 hours of project tutorials         Assessment Method       One 2-hour written examination (60% weighting), project report (40% weighting)         Course Grade       A+ to F         Grade Descriptors       A       Demonstrate thorough mastery of the course material. Show strong ability for analytical, critical and logica evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfam Demonstrate highly effective organizational and presentational skills.         B       Demonstrate substantial command of the course material and an ability to apply knowledge to familiar and s situations. Show evidence of analytical, critical thought to some complex issues. Apply effective organizational skills.         C       Demonstrate general but incomplete command of the course material and an ability to apply knowledge to a situations. Apply effective organizational skills.						
Teaching Hours       24 hours of lectures, 8 hours of group discussion, 4 hours of project tutorials         Assessment Method       One 2-hour written examination (60% weighting), project report (40% weighting)         Course Grade       A+ to F         Grade Descriptors       A         B       Demonstrate highly effective organizational and presentational skills.         B       Demonstrate general but incomplete command of the course material and an ability to apply knowledge to general skills.         C       Demonstrate general but incomplete command of the course material and an ability to apply knowledge to a wide range of complex, familiar and unfam Demonstrate highly effective organizational and presentational skills.	Dec					
Assessment Method       One 2-hour written examination (60% weighting), project report (40% weighting)         Course Grade       A+ to F         Grade Descriptors       A       Demonstrate thorough mastery of the course material. Show strong ability for analytical, critical and logica evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfam Demonstrate highly effective organizational and presentational skills.       Demonstrate substantial command of the course material and an ability to apply knowledge to familiar and s situations. Show evidence of analytical, critical thought to some complex issues. Apply effective organ presentational skills.         C       Demonstrate general but incomplete command of the course material and an ability to apply knowledge to report situations. Show evidence of some critical and logical thinking abilities. Apply moderately effective organizational skills.						
Course Grade       A+ to F         Grade Descriptors       A         B       Demonstrate thorough mastery of the course material. Show strong ability to apply knowledge to familiar and unfam Demonstrate highly effective organizational and presentational skills.         B       Demonstrate substantial command of the course material and an ability to apply knowledge to familiar and situations. Show evidence of analytical, critical thought to some complex issues. Apply effective organizational skills.         C       Demonstrate general but incomplete command of the course material and an ability to apply knowledge to resentational skills.	24 hours of lectures, 8 hours of group discussion, 4 hours of project tutorials					
Grade Descriptors       A       Demonstrate thorough mastery of the course material. Show strong ability for analytical, critical and logical evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfam Demonstrate highly effective organizational and presentational skills.         B       Demonstrate substantial command of the course material and an ability to apply knowledge to familiar and situations. Show evidence of analytical, critical thought to some complex issues. Apply effective organ presentational skills.         C       Demonstrate general but incomplete command of the course material and an ability to apply knowledge to range of some critical and logical thinking abilities. Apply moderately effective organ						
A       Demonstrate holegen microsoft of non-soft of apply knowledge to a wide range of complex, familiar and unfair Demonstrate highly effective organizational and presentational skills.         B       Demonstrate substantial command of the course material and an ability to apply knowledge to familiar and unfair presentational skills.         C       Demonstrate general but incomplete command of the course material and an ability to apply knowledge to a presentational skills.						
B         situations. Show evidence of analytical, critical thought to some complex issues. Apply effective orga presentational skills.           C         Demonstrate general but incomplete command of the course material and an ability to apply knowledge to situations. Show evidence of some critical and logical thinking abilities. Apply moderately effective orga						
C situations. Show evidence of some critical and logical thinking abilities. Apply moderately effective orga						
presentational skills.						
Demonstrate partial but limited command of the course material and a limited ability to apply knowledge to s Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Apply li effective organizational and presentational skills.						
Fail Demonstrate little or no evidence of command of course material with very little or no ability to apply know problems. Lack of critical thinking abilities and incoherent thinking. Organization and presentational skills effective or ineffective.						
Textbooks 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)	Bryant E.: Natural Hazards (Cambridge University Press, 2005)					
Remarks Offered from 2010-2011						

ENVS2011 Directed	studies in	environmental scienc	e (6 credits)	Academic Year	2012		
Offering Department	Earth Scier	ces		Quota			
Course Co-ordinator	Dr Y Zong,	Earth Sciences					
Course Aim		To enhance students knowledge on a particular topic in environmental science and students self-directed learnin and critical thinking skills.					
Course Contents	material be	Students undertake extensive reading on a selected topic guided by a staff member. Reading should cove material beyond textbooks. Students are required to analyze the material read, formulate their own scientifi argument, and present it in written form.					
Learning Outcomes	- complete	On successful completion of this course, students should be able to: - complete a research task independently in one or more of the four areas of the major, and - show competence in formulating their own scientific argument.					
Pre-requisites	PHYS0625 GPA 2.5 or	y three of these courses: PHYS1417; and above in Year 1 courses; vironmental Science.	: BIOL0126, CHEM0008, CH and	HEM1009, EASC0118, ENV:	S0001, ENVS1002		
Offer in 2012 - 2013	Year long			Examination	No Exam		
Offer in 2013 - 2014	Y						
Teaching Hours		ecture is given. But advide expected to work at least	ce will be given by a staff n st 50 hours on a project.	nember on reading material	on a chosen topic		
Assessment Method	Coursewor an oral pre		ttended essay (5000 words ε	excluding figures, references	and appendix), an		
Course Grade	A+ to F						
Grade Descriptors	A	topic, with evidence of original sources to draw appropriate a	standing of the topic, excellent deve thought. Insightful use and critical a and insightful conclusions. Present eyond that is required in wider areas	nalysis of information drawn from a ed in high academic standard. [Wo	full range of high quality		
	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.
Remarks	Consent fro	om major coordinator is required for this course.

ENVS2013 Environn	nental Ocea	anography (6	credits)			Academic Year	2012
Offering Department	Earth Scier	nces				Quota	
Course Co-ordinator	Dr Y Zong,	, Earth Sciences	;				
Course Aim	the importa To convey	To provide students with a thorough introduction to coastal and ocean processes with key questions to highligh the importance of the oceanographic processes to environmental conditions. To convey the basic science behind ocean-atmosphere and ocean-biosphere interactions and place it within th context of human's connectedness to the physical world.					
Course Contents	their impact looking at the evaluate the resources,	To provide a solid foundation of knowledge about the physical processes dictating the oceans movements and their impacts on the environment. The oceans take up 71% of earth's surface and contain 98% of the water. B looking at the structure of the atmosphere, thermodynamic principals and properties governing sea water, we wi evaluate the critical roles the ocean plays in the environmental system including its influence on climate, coasta resources, and nutrient cycling. Case studies specifically examining changes in sea level rise, El Nino, and climat will be used to connect oceanographic principles to environmental problems.					
Learning Outcomes	<ul> <li>Describe</li> <li>Identify and</li> <li>Describe</li> </ul>	the major surface and describe imp sources and dis	ce and deep currer ortant processes ir stribution of critical	dents should be able hts of the ocean. In the ocean controlli chemicals and sea an processes, clima	ng large sca water proper	ties in the ocean.	
Pre-requisites		SC0118; and dents who have	passed in EASC2	129.			
Offer in 2012 - 2013	Not offered	b				Examination	To be confirmed
Offer in 2013 - 2014	Y						
Teaching Hours	24 hours of	of lectures, up to	24 hours of group	discussion and clas	s debate.		
Assessment Method	One two ho	our written exam	nination (50% weig	hting), course work	assessment	(50% weighting).	
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.						
	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.						
	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		of critical thinking abil	ommand of course mate ities and incoherent thin			
Textbooks		r: Its Compositio versity Press, 2r		Behaviour (Open Ur	niversity Pres	s, 2nd edition) and	Ocean Circulation

ENVS3015 Environn	nental science project (12 credits)	Academic Year	2012				
Offering Department	Earth Sciences	Quota					
Course Co-ordinator	Dr Y Zong, Earth Sciences						
Course Aim	To enhance students knowledge and research skills in advanced level of environmental science.						
Course Contents	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.						
Learning Outcomes	On successful completion of this course, students should be able to: - complete a dissertation project of undergraduate level in one of the four areas of the major, and - show competence in formulation, data collection, analysis, and presentation of a research project.						
Pre-requisites	Pass in at least 18 credits of level 2 and level 3 courses in Environmental Science major; and Students must have a GPA of 3.0 or above; and Major in Environmental Science.						
Offer in 2012 - 2013	Examination	No Exam					

Offer in 2013 - 2014	Y	Υ						
Teaching Hours		No formal lecture is given. Supervision meetings are to be arranged by the student and supervisor. The student is expected to spend at least 120 hours on the project.						
Assessment Method		Coursework (100% weighting) in the form of an undergraduate dissertation with no more than 10000 words excluding figures, references and appendix, and an oral presentation.						
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	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	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.						
Remarks	Consent fr	rom major coordinator is required.						

MATH0011 Numbers	s and patte	terns in	n nature and li	ife (3 credits)		Academic Year	2012	
Offering Department	Mathemat	atics				Quota		
Course Co-ordinator	Head of D	Dept, Ma	athematics					
Course Aim		disciplin			various topics in life natics as a potent to			
Course Contents	sequencir	Topics, with their related mathematics, will be chosen from the following: bioinformatics, DNA sequencing and alignment, genetic inheritance, sustainable harvesting, spread and control of epidemics, population growth, evolution strategies, predator-prey dynamics, etc.						
Learning Outcomes	<ul> <li>understa sciences;</li> <li>apply ba</li> </ul>	On successful completion of the course, students should be able to: understand and appreciate the underlying mathematical structure in some areas of life and environmental sciences; apply basic mathematical modeling on some life science problems; interpret and analyze mathematical data pertaining to life and environmental sciences.						
Pre-requisites	E or abov	ve in HK	CEE Math					
Offer in 2012 - 2013	Not offere	red				Examination	To be confirmed	
Offer in 2013 - 2014	N							
Teaching Hours	24 hours of	s of lectu	res and student-o	centered learning				
Assessment Method	One 1-hou	our writte	en examination (5	50% weighting) and c	continuous assessme	nt (50% weighting)		
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.						
	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.						
	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		onstrates poor and in eing able to complete		by not being able to identi	y appropriate theorems	or their applications, o	
Textbooks	To be dec	ecided by	y the course instr	uctor.				
Course Website	http://hkur	umath.hk	ku.hk/course/MA	TH0011/				

MATH0201 Basic ca	Iculus (6 credits)	Academic Year	2012
Offering Department	Mathematics	Quota	
Course Co-ordinator	Dr C W Wong, Mathematics		
Course Aim	To provide students with a basic background of calculus that can be app students not having done much mathematics beyond HKCEE mathematic (University Mathematics A). Students with good grades in this course of (University Mathematics B) or MATH1211 (Multivariable Calculus) as follow-	cs. It can be followe an also consider ta	d by MATH180
Course Contents	<ul> <li>Sets, real numbers</li> <li>Equations and inequalities</li> <li>Functions, graphs and inverses</li> <li>Exponential and logarithmic functions</li> <li>Limits and continuity</li> <li>Differentiation, chain rule, implicit differentiation</li> <li>Higher order derivatives, curve sketching, maxima and minima</li> <li>Definite and indefinite integrals, change of variables</li> </ul>		
Learning Outcomes	On successful completion of the course, students should be able to: - understand and use the set notations in simple situations; - understand notions of functions and describe properties of a function appro - grasp the intuitive concept of limits, and evaluate various limits of elementa - examine the continuity of a function, and apply the intermediate value prop continuous functions; - grasp the intuitive meanings of derivatives and integrals, evaluate der functions; apply rules of differentiation and integration to handle more comple - apply calculus to solve problems from geometry, economics, physical scien	ry functions; erty and the extreme ivatives and integra ex functions;	ls of elementar
Pre-requisites	E or above in HKCEE Mathematics; and Not for students with E or above in HKCEE Add. Math or AS Math and Stat or Not for students who have already passed in MATH0801 or before; and Not for students who have passed MATH0211, or have already enrolled in the	,	-
Offer in 2012 - 2013	1st sem	Examination	Dec
Offer in 2013 - 2014	Ν		
Teaching Hours	36 hours of lectures and student-centered learning		

Assessment Method	One 2.5	One 2.5-hour written examination (50% weighting) together with coursework assessment (50% weighting)						
Course Grade	A+ to F	A+ to F						
Grade Descriptors	A	Demonstrate excellent knowledge and understanding of the key concepts and the theorems to achieve the learning outcomes. Always select appropriate theoretical and technical knowledge to solve a wide variety of problems. Evidence of ability to solve non – routine problems. Always manipulate mathematical expressions and calculate with high accuracy.						
	в	Demonstrate a good knowledge and understanding of the key concepts and the theorems to achieve the learning outcomes. Usually select appropriate theoretical and technical knowledge to solve a variety of problems. Evidence of ability to partly solve non – routine problems. Usually manipulate mathematical expressions and calculate with high accuracy.						
	с	Demonstrate some knowledge and understanding of the key concepts and the theorems to achieve the learning outcomes. Often select appropriate theoretical and technical knowledge to solve or partly solve some routine problems. Usually manipulate mathematical expressions and calculate with an adequate level of accuracy.						
	D	Demonstrate minimum knowledge and understanding of the key concepts and the theorems to achieve the learning outcomes. Sometimes select appropriate theoretical and technical knowledge to solve or partly solve some routine problems. Sometimes manipulate mathematical expressions and calculate with an adequate level of accuracy.						
	Fail	Fail to demonstrate knowledge and understanding of the key concepts and the theorems to achieve the learning outcomes. Very little evidence of ability to select appropriate theoretical and technical knowledge to solve problems. Manipulate mathematical expressions and calculate with substantial errors.						
Textbooks	Raymon	d A Barnett et al: Calculus for Business, Economics, Life Sciences & Social Sciences (Pearson Education)						
Course Website	http://hk	umath.hku.hk/course/MATH0201/						

MATH0211 Basic ap	plicable m	nathematics (6 credits)	Academic Year	2012	<u>.</u>		
Offering Department	Mathemat	lics	Quota				
Course Co-ordinator	Dr C W W	long, Mathematics					
Course Aim	with a ba moderate good grad	se aims at students not having done much mathematics beyond HK sic background of mathematics that is essential for concentrating level mathematical tools. It can be followed by MATH1804 (Univ des in this course can also consider taking MATH1805 (Unive able Calculus) as follow-up.	in various disciplin ersity Mathematics	es whi A). Stu	ch require dents with		
Course Contents	<ul> <li>Function</li> <li>Limit and</li> <li>Different</li> <li>Higher o</li> <li>Partial d</li> <li>Sequend</li> <li>Matrices</li> <li>Definite</li> <li>Double i</li> </ul>	<ul> <li>Set theory, permutation and combination</li> <li>Functions, graphs and inverses</li> <li>Limit and continuity</li> <li>Differentiation</li> <li>Higher order derivatives, curve sketching, maxima and minima</li> <li>Partial differentiation</li> <li>Sequences and series</li> <li>Matrices and determinants</li> <li>Definite and indefinite integrals, change of variables</li> <li>Double integral</li> <li>Numerical methods (bisection method, Newton's method etc)</li> </ul>					
Learning Outcomes	<ul> <li>understa</li> <li>sketch a</li> <li>function;</li> <li>understa</li> <li>compute</li> <li>understa</li> </ul>	ssful completion of the course, students should be able to: and the concept of sets, permutations and combinations; and analyze the graphs of some basic functions, and understand the and the concept of differentiation and solve applied optimization prol basic indefinite/definite integrals; and the basic arithmetic of matrices and compute the determinants f partial derivatives for functions of two variables and double integrals	blems using different or 2x2 and 3x3 matr	iation; ices;	tinuity of a		
Pre-requisites	Not for stu Not for stu	ve in HKCEE Math or HKCEE Add. Math or AS Math & Stat); and udents with E or above in AL Pure Math; and udents who have already passed in MATH0801 before; and udents who have passed in MATH0201, or have already enrolled in	this course.				
Offer in 2012 - 2013	1st sem	2nd sem	Examination	Dec	May		
Offer in 2013 - 2014	N						
Teaching Hours	36 hours of	of lectures and student-centered learning					
Assessment Method	One 2.5-h	our written examination (50% weighting) together with coursework	assessment (50% w	eighting	g)		
Course Grade	A+ to F						
Grade Descriptors	A Demonstrate excellent knowledge and understanding of the key concepts and the theorems to achieve the learning outcomes. Always select appropriate theoretical and technical knowledge to solve a wide variety of problems. Evidence of ability to solve non – routine problems. Always manipulate mathematical expressions and calculate with high accuracy.						
	B Demonstrate a good knowledge and understanding of the key concepts and the theorems to achieve the learning outcomes. Usually select appropriate theoretical and technical knowledge to solve a variety of problems. Evidence of ability to partly solve non – routine problems. Usually manipulate mathematical expressions and calculate with high accuracy.						
	В	Usually select appropriate theoretical and technical knowledge to solve a variety	e theorems to achieve th of problems. Evidence of				
	B C	Usually select appropriate theoretical and technical knowledge to solve a variety	e theorems to achieve th of problems. Evidence of late with high accuracy. theorems to achieve the artly solve some routine	ability to	partly solve		
		Usually select appropriate theoretical and technical knowledge to solve a variety non – routine problems. Usually manipulate mathematical expressions and calcu Demonstrate some knowledge and understanding of the key concepts and the Often select appropriate theoretical and technical knowledge to solve or p	e theorems to achieve th of problems. Evidence of late with high accuracy. In theorems to achieve the artly solve some routine the theorems to achieve the artly solve some routine p	e learning probler e learning	g outcomes. ns. Usually g outcomes.		
	С	Usually select appropriate theoretical and technical knowledge to solve a variety non – routine problems. Usually manipulate mathematical expressions and calcu Demonstrate some knowledge and understanding of the key concepts and the Often select appropriate theoretical and technical knowledge to solve or p manipulate mathematical expressions and calculate with an adequate level of ac Demonstrate minimum knowledge and understanding of the key concepts and the Sometimes select appropriate theoretical and technical knowledge to solve or p	e theorems to achieve th of problems. Evidence of late with high accuracy. theorems to achieve the artly solve some routine curacy. the theorems to achieve the artly solve some routine p curacy.	e learning probler learning e learnin problems.	g outcomes. Sometimes g outcomes.		

MATH1001 Fundame	ental conce	pts of mathemati	cs (6 credits)		Academic Year	2012
Offering Department	Mathematic	s			Quota	
Course Co-ordinator	Dr Y M Cha	n, Mathematics			1	
Course Aim	proofs. Su	ch concepts and m s. This course can b	ackground on fundamenta ethods are important fo e followed by (or taken co	or subsequent stud	lies in all higher l	evel courses
Course Contents	<ul> <li>statement</li> <li>mathemat</li> <li>relations a</li> <li>finite and</li> <li>natural nu</li> <li>axiomatic</li> </ul>	ical proofs Ind functions nfinite sets mbers and mathemat systems in mathematers and the limit of a	tics			
Learning Outcomes	<ul> <li>understan</li> <li>construct</li> <li>apply diffestatement;</li> <li>demonstration</li> <li>understand</li> </ul>	d the definition of a s the truth table of a giv rent proof strategies ate the basic propertie	(e.g. proof by contradictions of equivalence relation limit of a sequence of rea	simple daily life pro on and mathematica s;		g a mathema
Pre-requisites	Not for stud	ents who have alread	or AS Math & Stat; and dy passed in MATH1101 I dy passed in MATH1201 I			
Offer in 2012 - 2013	1st sem 2	nd sem			Examination	Dec May
Offer in 2013 - 2014	Y					
Teaching Hours						
	36 hours of	lectures and student	centered learning			
Assessment Method			centered learning n (50% weighting) togethe	er with coursework a	assessment (50% we	eighting)
Assessment Method Course Grade			ŭ	er with coursework a	assessment (50% we	eighting)
	One 2.5-ho	ur written examination Demonstrate an exceller their applications throug	ŭ	ots and ideas by being a ns, clearly and elegantl	ble to identify the appro	priate theorems ical reasoning a
Course Grade	One 2.5-ho A+ to F	Demonstrate an exceller their applications throug argumentation and bein solving problems. Demonstrate a good und applications through corr	n (50% weighting) togethe	ots and ideas by being a rs, clearly and eleganti ns carefully and correct rd ideas by being able to ith some minor inadequa	ble to identify the appro y presenting correct log y, and with some innov b identify the appropriate cies in arguments, identi	priate theorems ical reasoning a ative approaches theorems and t
Course Grade	One 2.5-ho A+ to F	Demonstrate an exceller their applications throug argumentation and bein solving problems. Demonstrate a good unn applications through corr theorems or their applica Demonstrate an accepta but with some inadequa	t understanding of key concept correctly analysing problem g able to carry out computatio derstanding of key concepts ar actly analysing problems, but w	ots and ideas by being a rs, clearly and elegant ns carefully and correct id ideas by being able to ith some minor inadequa ome minor computationa pts and ideas by being a	ble to identify the appro y presenting correct log y, and with some innov o identify the appropriate icies in arguments, identi l errors.	priate theorems ical reasoning a ative approaches theorems and t tying the appropri
Course Grade	One 2.5-ho A+ to F A B	Demonstrate an exceller their applications throug argumentation and bein solving problems. Demonstrate a good un applications through corr theorems or their applica Demonstrate an accepta but with some inadeque presentation or a number Demonstrate some unde	t understanding of key concept th correctly analysing problem g able to carry out computatio derstanding of key concepts ar actly analysing problems, but w tions and presentation or with s oble understanding of key conce acies in applying the theorem of minor computational errors. rstanding of key concepts and i in applying the theorems throu	ts and ideas by being a s, clearly and eleganti ns carefully and correct id ideas by being able to ith some minor computationa pts and ideas by being a s through incorrectly and deas by being able to co	ble to identify the appro y presenting correct log y, and with some innov b identify the appropriate cies in arguments, identi l errors. ble to correctly identify a nalysing problems with rrectly identify appropriat	priate theorems ical reasoning a ative approaches theorems and t fying the appropri- popropriate theore poor argument a e theorems, but
Course Grade	One 2.5-ho A+ to F A B C	Demonstrate an exceller their applications throug argumentation and bein solving problems. Demonstrate a good und applications through corr theorems or their applica Demonstrate an accepta but with some inadequa presentation or a number Demonstrate some unde substantial inadequacies or with substantial comptone	In (50% weighting) togethe at understanding of key concept th correctly analysing problem g able to carry out computation derstanding of key concepts ar ectly analysing problems, but we tions and presentation or with so pole understanding of key conce acies in applying the theorem of minor computational errors. rstanding of key concepts and i in applying the theorems throut tational errors. nadequate understanding by n	ts and ideas by being a s, clearly and eleganti ns carefully and correct id ideas by being able to ith some minor inadequa ome minor computationa pts and ideas by being a s through incorrectly an deas by being able to co igh incorrectly analysing	ble to identify the appro y presenting correct log y, and with some innov b identify the appropriate icces in arguments, identi errors. ble to correctly identify a halysing problems with problems with poor arguin	priate theorems ical reasoning a ative approaches theorems and t fying the appropri- popropriate theore poor argument a e theorems, but nent or presenta
Course Grade	One 2.5-ho A+ to F A B C D Fail Gray Chart	Ur written examination Demonstrate an exceller their applications throug argumentation and bein solving problems. Demonstrate a good und applications through corr theorems or their applica Demonstrate an accepta but with some inadequa- presentation or a number Demonstrate some unde substantial inadequacies or with substantial compu Demonstrates poor and not being able to completion	t understanding of key concept the correctly analysing problem g able to carry out computation derstanding of key concepts ar ectly analysing problems, but we tions and presentation or with s oble understanding of key conce acies in applying the theorem of minor computational errors. rstanding of key concepts and i in applying the theorems throug tational errors. nadequate understanding by n e the solution.	ts and ideas by being a s, clearly and eleganti ns carefully and correct it ideas by being able to ith some minor inadequa ome minor computationa pts and ideas by being a s through incorrectly an deas by being able to cc igh incorrectly analysing ot being able to identify	ble to identify the appro y presenting correct log y, and with some innov b identify the appropriate icies in arguments, identi errors. ble to correctly identify a halysing problems with problems with poor argun appropriate theorems or	priate theorems ical reasoning a ative approaches theorems and t fying the appropri- popropriate theore poor argument a e theorems, but nent or presenta their applications
Course Grade Grade Descriptors	One 2.5-ho A+ to F A B C D Fail Gray Chart Boston (Pe	Demonstrate an exceller their applications throug argumentation and beins solving problems. Demonstrate a good und applications through corr theorems or their applica Demonstrate an accepta but with some inadequa presentation or a number Demonstrate some unde substantial inadequacies or with substantial compu Demonstrates poor and not being able to complete rand, Albert D Polime	th understanding of key concept th correctly analysing problem g able to carry out computation derstanding of key concepts are ectly analysing problems, but w tions and presentation or with s oble understanding of key conce acies in applying the theorem of minor computational errors. rstanding of key concepts and i in applying the theorems throu tational errors. nadequate understanding by n e the solution.	ts and ideas by being a s, clearly and eleganti ns carefully and correct it ideas by being able to ith some minor inadequa ome minor computationa pts and ideas by being a s through incorrectly an deas by being able to cc igh incorrectly analysing ot being able to identify	ble to identify the appro y presenting correct log y, and with some innov b identify the appropriate icies in arguments, identi errors. ble to correctly identify a halysing problems with problems with poor argun appropriate theorems or	priate theorems ical reasoning a ative approaches theorems and t fying the appropri- popropriate theore poor argument a e theorems, but nent or presenta their applications

MATH1111 Linear a	lgebra (6 credits)	Academic Year	2012
Offering Department	Mathematics	Quota	
Course Co-ordinator	Dr Y K Lau, Mathematics		
Course Aim	Linear algebra has wide applications to diverse areas in natural science science. This course provides students an introduction to the theory a foundation course for all mathematics students, to be followed by other such as MATH2301, MATH2303.	and techniques of linea	ar algebra. It is a
Course Contents	<ul> <li>Systems of linear equations</li> <li>Row equivalence of matrices</li> <li>Matrix algebra, determinant and rank of matrices</li> <li>Vector spaces, subspaces, basis and dimension</li> <li>Linear transformation, change of bases</li> <li>Diagonalization of matrices</li> </ul>		
Learning Outcomes	On successful completion of the course, students should be able to: - solve systems of linear equations, manipulate matrix algebra and or elementary matrices; - understand the concept and basic structure of vector spaces, give e		

## Department of Mathematics

	<ul> <li>concept of dimension, apply the dimension theorem (for the sum of two subspaces);</li> <li>elucidate the nullspace, row space and column space of a matrix, apply the rank-nullity theorem;</li> <li>give examples and non-examples of linear transformations, evaluate the matrix representations of a line transformation;</li> <li>evaluate eigenvalues and eigenvectors, evaluate algebraic multiplicity and geometric multiplicity, diagonalize matrix.</li> </ul>					
Pre-requisites	(E or above in (HKCEE Add. Math and AS Math & Stat); or E or above in AL Pure Math; or Pass in MATH1804 and Not for students who have already passed in MATH1101 before; and Not for students who have already passed in MATH1102 before.					
Offer in 2012 - 2013	1st sem 2	Ind sem	Examination	Dec May		
Offer in 2013 - 2014	Ν					
Teaching Hours	36 hours of	lectures and student-centered learning. Tutorials will also be arr	anged.			
Assessment Method	One 2.5-ho	ur written examination (50% weighting) together with coursework	assessment (50% v	veighting)		
Course Grade	A+ to F					
Grade Descriptors	A Demonstrate a thorough 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 substantial inadequacies in applying the theorems through incorrectly analysin 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.					
Textbooks	Steven J Le	eon: Linear Algebra with Applications (Pearson Prentice Hall)				
Course Website	http://hkum	ath.hku.hk/course/MATH1111/				
Remarks	Students w	ith a good grade in MATH0201 or MATH0211 can also apply.				

MATH1211 Multivari	able calcu	us (6 credits)		Academic Year	2012
Offering Department	Mathemati	S		Quota	
Course Co-ordinator	Dr G Han,	Mathematics			
Course Aim	apply the t Mathemati Students t	neory to solve practical proble cs/Physics, and is suitable for	ory of multivariable calculus in a rath ems. This is a required course for sturn r all students who will use multivar ay take this course as one of the m of more advanced level.	idents taking major i iable calculus in the	n Mathematics o eir area of study
Course Contents	and spheri - Differenti - Vector-vo operator - Maxima multipliers - Multiple i - Line integ	cal coordinates ation in several variables: limit lued functions: parametrized and minima: differentials and applications of extrema ttegration: double and triple in rals: scalar and vector line int	sions; dot product and cross product s and derivatives; the chain rule; dire curves; arc-length; vector fields; gu Taylor's Theorem of several varial tegrals; change of variables; applica egrals; Green's Theorem; conservati arametrized surfaces; surface integr	actional derivatives a adient, divergence, ples; extrema of fun tions ve vector fields	nd gradients curl, and the de ctions; Lagrange
Learning Outcomes	<ul> <li>understation</li> <li>evaluate</li> <li>apply the</li> </ul>	partial derivatives and multiple knowledge to solve some p	students should be able to: theory of calculus of functions in sev integrals; compute line integrals and ractical problems, such as constrai egration of multivariable functions.	d surface integrals;	blems and othe
Pre-requisites	and	e in (HKCEE Add. Math and a	AS Math & Stat); or E or above in A ed in MATH1202 before.	L Pure Math; or Pas	s in MATH1804
Offer in 2012 - 2013	1st sem	2nd sem		Examination	Dec May
Offer in 2013 - 2014	Y				
Teaching Hours	36 hours o	lectures and student-centere	d learning. Tutorials will also be arra	nged.	
Assessment Method	One 2.5-h	ur written examination (50% v	veighting) together with coursework	assessment (50% we	eighting)
Course Grade	A+ to F				
Grade Descriptors	A	their applications through correct	anding of key concepts and ideas by being y analysing problems, clearly and elegant carry out computations carefully and correc	ly presenting correct log	ical reasoning and
		Demonstrate a good understandin	g of key concepts and ideas by being able $365$	o identify the appropriate	theorems and their

		ations through correctly analysing problems, but with some minor inadequacies in arguments, identifying the appropriate ms or their applications and presentation or with some minor computational errors.
	C but w	nstrate an acceptable understanding of key concepts and ideas by being able to correctly identify appropriate theorems, ith some inadequacies in applying the theorems through incorrectly analysing problems with poor argument and tation or a number of minor computational errors.
	D substa	nstrate some understanding of key concepts and ideas by being able to correctly identify appropriate theorems, but with antial inadequacies in applying the theorems through incorrectly analysing problems with poor argument or presentation a substantial computational errors.
		nstrates poor and inadequate understanding by not being able to identify appropriate theorems or their applications, or ing able to complete the solution.
Textbooks	To be decided by	the course instructors.
References	Vector Calculus, 3	3rd Edition, by Susan Jane Colley, 2006, Pearson Prentice Hall
Course Website	http://hkumath.hk	u.hk/course/MATH1211/
Remarks		od grades in MATH0201 or MATH0211 can also apply. Students are assumed to have mastered ariable prior to taking this course.)

MATH1611 Mathema	atical labor	oratory a	and modeling (6 c	redits)		Academic Year	2012		
Offering Department	Mathemati	Athematics Quota 20							
Course Co-ordinator	Dr K H Cha	Dr K H Chan, Mathematics							
Course Aim	programmi	ming lang Ecology,	juage will be taught Statistics and Manag	d free computer software S via a number of mathema gement. Some basic and in	atical mode	els in Physics, Cl	nemistry,		
Course Contents	Data fitting	cilab. Elementary mathematical modeling, predator-prey models, epidemic models, host-parasite model etc. ata fitting models and simulation of simple random variable. Random walk models and inventory models. fferentiation and integration of one variable. Elementary linear algebra.							
Learning Outcomes	<ul> <li>recognize</li> <li>demonstr</li> <li>write and</li> <li>solve sim</li> </ul>	ze the imp strate basi nd interpre imple num	oortance of numerical ic algebraic and arithn et programs in Scilab p erical problems using	students should be able to: methods in mathematical mo netic computations in the Scil orogramming language; interactive Scilab commands al problems by writing Scilab	lab environ s;	ment;			
Pre-requisites	E or above	ve in HKC	EE Add. Math or AS I	Math & Stat					
Offer in 2012 - 2013	2nd sem					Examination	May		
Offer in 2013 - 2014	Y								
Feaching Hours	36 hours o	of lecture	s and student-centere	ed learning					
Assessment Method			en examination (50% sts and/or assignment	weighting) together with cous.	ursework a	ssessment (50%	weighting) base		
Course Grade	A+ to F								
Grade Descriptors	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	Scilab	environments, but with sor	rstanding of key concepts and Scil- me inadequacies in solving numeri environments or with a number of m	ical problems	with Scilab through i	ncorrectly analysing		
	D	environ	ments, but with substantia	of key concepts and Scilab skills al inadequacies in solving numeric environments or with substantial pro	cal problems	with Scilab through in			
	Fail		strates poor and inadequa tions, or not being able to c	te understanding by not being ab omplete the solution.	ble to identify	appropriate Scilab er	vironments or their		
Textbooks	To be deci	cided by t	he course instructor.						
References	F. R. Gioro Thomson L	,	'	A first course in mathematic	cal modelin	g, (Pacific Grove,	CA: Brooks/Co		
Course Website	http://hkum	umath.hku	.hk/course/MATH161	1					

MATH1804 Universi	ty mathematics A (6 credits)	Academic Year	2012					
Offering Department Mathematics Quota								
Course Co-ordinator	Dr Y M Chan, Mathematics							
Course Aim	To provide students with a more solid background of calculus of one varial several variables and matrices that can be applied in various disciplines, elementary calculus course. It can be followed by MATH1211 (Multivariable C	aiming at students						
Course Contents	- Sets and functions							

Course Website	http://hkum	nath.hku.hk/course/MATH1804		
Textbooks	University	hony and Norman Biggs: Mathematics for Economics and Financ Press, 1996) nner: The Calculus Lifesaver: All the Tools You Need to Excel at		0
	Fail	Demonstrates poor and inadequate understanding by not being able to identifinot being able to complete the solution.	y appropriate theorems or	their applications, or
	D	Demonstrate some understanding of key concepts and ideas by being able to substantial inadequacies in applying the theorems through incorrectly analysin or with substantial computational errors.		
	С	Demonstrate an acceptable understanding of key concepts and ideas by being but with some inadequacies in applying the theorems through incorrectly presentation or a number of minor computational errors.		
	В	Demonstrate a good understanding of key concepts and ideas by being able applications through correctly analysing problems, but with some minor inadeq theorems or their applications and presentation or with some minor computation	uacies in arguments, iden	
Grade Descriptors	A	Demonstrate an excellent understanding of key concepts and ideas by being their applications through correctly analysing problems, clearly and elegar argumentation and being able to carry out computations carefully and corre solving problems.	ntly presenting correct lo	gical reasoning and
Course Grade	A+ to F			
Assessment Method	One 2.5-h	our written examination (50% weighting) together with coursework	assessment (50% w	eighting)
Teaching Hours	36 hours o	f lectures and student-centered learning		
Offer in 2013 - 2014	Ν			
Offer in 2012 - 2013	1st sem	2nd sem	Examination	Dec May
Pre-requisites	Not for stu Not for stu	e in HKCEE Add. Math or AS Math & Stat; or Pass in MATH0201 dents with E or above in AL Pure Math; and dents who have passed in MATH1805 or MATH1211, or have alre dents who have already passed in MATH0802 or MATH1811 or M	eady enrolled in these	e courses; and
Learning Outcomes	<ul> <li>understai</li> <li>understai</li> <li>understa</li> <li>understa</li> <li>theorem, s</li> <li>understa</li> <li>and improp</li> <li>understa</li> <li>equations,</li> <li>understa</li> </ul>	sful completion of the course, students should be able to: nd the concept of sets and sketch the graphs of some basic function and the concept of limit and continuity; nd various topics in differentiation such as the concept of a deriv- simple curve sketching, Taylor polynomials and error estimation; nd various topics in integration such as the fundamental theorem per integrals; nd various topics in matrices such as the basic arithmetic of ma eigenvalues and eigenvectors of 2x2 matrices; nd various topics in functions of two variables including partial d and double integrals using iterated integrals.	vative, differentiability n of calculus, technic trices, determinants,	ues of integration systems of linear
	<ul> <li>Differenti</li> <li>Integration</li> <li>Functions</li> <li>Maxima a</li> <li>Double in</li> <li>Matrices,</li> </ul>	d continuity ation, application, Taylor approximation on and techniques, improper integrals s of several variables, partial differentiation and minima, Lagrange multipliers itegrals systems of linear equations, inverses, determinants ues and eigenvectors		

MATH1805 Universi	ty mathematics B (6 credits)	Academic Year	2012
Offering Department	Mathematics	Quota	
Course Co-ordinator	Dr C W Wong, Mathematics		
Course Aim	To provide students with a solid background of calculus of several varia to ordinary differential equations that can be applied in various discip more advanced courses in mathematics.		
Course Contents	<ul> <li>Operations on matrices, systems of linear equations, determinants; ei</li> <li>Functions of several variables; partial differentiation; directional deriva</li> <li>Affine linear and quadratic functions; Taylor approximations</li> <li>Maxima and minima; Lagrange multipliers</li> <li>Double and triple integrals</li> <li>Ordinary differential equations (ODE) of special types: separat homogeneous ODE, change of variables</li> </ul>	atives	
Learning Outcomes	<ul> <li>On successful completion of the course, students should be able to:</li> <li>determine the solutions of a system of linear equations by investi (reduced) row echelon form, and apply these techniques to solve pro- sciences;</li> <li>diagonalize symmetric matrices, and demonstrate its applications social sciences, define and determine the definiteness of symmetric ma- understand the geometric meaning of partial derivatives, the first or multivariate functions;</li> <li>optimize multivariate objective functions (with/without constraints);</li> <li>evaluate integrals over curvilinear regions in the space;</li> <li>solve simple first order ordinary differential equations.</li> </ul>	iblems from economics, p in problems from econon atrices;	hysical and soc nics, physical a

	Not for students who have passed in MATH Not for students who have already passed															
Offer in 2012 - 2013	2nd sem	2nd sem Examination May														
Offer in 2013 - 2014	N															
Teaching Hours	36 hours	rs of l	of lecture	es and stud	dent-cer	ntered	learnin	ng								
Assessment Method	One 2.5-	5-hou	our writt	ten examina	nation (5	50% we	eighting	g) toge	ther w	ith co	ursewo	rk ass	essmer	nt (50% v	weightin	g)
Course Grade	A+ to F															
Grade Descriptors	A	Demonstrate excellent knowledge and understanding of the key concepts and the theorems to achieve the learning outcomes. A Always select appropriate theoretical and technical knowledge to solve a wide variety of problems. Evidence of ability to solve non – routine problems. Always manipulate mathematical expressions and calculate with high accuracy.														
	в	Demonstrate a good knowledge and understanding of the key concepts and the theorems to achieve the learning outcomes. Usually select appropriate theoretical and technical knowledge to solve a variety of problems. Evidence of ability to partly solve non – routine problems. Usually manipulate mathematical expressions and calculate with high accuracy.														
	С	Demonstrate some knowledge and understanding of the key concepts and the theorems to achieve the learning outcomes. Often select appropriate theoretical and technical knowledge to solve or partly solve some routine problems. Usually manipulate mathematical expressions and calculate with an adequate level of accuracy.														
	D	Demonstrate minimum knowledge and understanding of the key concepts and the theorems to achieve the learning outcome Sometimes select appropriate theoretical and technical knowledge to solve or partly solve some routine problems. Sometime manipulate mathematical expressions and calculate with an adequate level of accuracy.														
	Fail Fail to demonstrate knowledge and understanding of the key concepts and the theorems to achieve the learning outcomes. Very little evidence of ability to select appropriate theoretical and technical knowledge to solve problems. Manipulate mathematical expressions and calculate with substantial errors.															
Course Website	http://hku	kuma	nath.hku	u.hk/course	e/MATH	11805										
Remarks	Students	nts wit	with a go	ood grade i	in MATH	H0201	or MA	TH021	1 can	also a	apply.					

Offering Department	Mathemat	atics Quota							
Course Co-ordinator		Dr C W Wong, Mathematics							
Course Aim	To provide	e students with	a background of d	calculus of several pplied in actuarial s		matrix algebra and	an introduction t		
Course Contents	<ul> <li>Eigenval</li> <li>Quadrati</li> <li>Function</li> <li>Taylor ap</li> <li>Maxima a</li> <li>Double a</li> </ul>	lues and eigenve ic functions and is of several vari pproximations	grangian multiplier Is	ation of matrices ns rentiation; direction	al derivatives				
Learning Outcomes	<ul> <li>understa</li> <li>linear equation</li> <li>theorem;</li> <li>understa</li> <li>local extrementa</li> <li>the change</li> </ul>	and various topi- ations, eigenval and various topi- ema, vector-valu e of variable for	cs in linear algebraics and eigenvections of functions of ed functions, Jaco	dents should be ab ra such as the bas tors, diagonalizable several variables i obians, the method ntial equations.	ic arithmetic o matrices, bas ncluding partia	is and dimension, a	and the rank-nullit		
Pre-requisites	Not for stu		already passed in	n MATH1202 or MA 1211 or MATH1805			e courses.		
Offer in 2012 - 2013	1st sem					Examination	Dec		
Offer in 2013 - 2014	N								
Teaching Hours	36 hours o	of lectures and s	tudent-centered le	earning					
Assessment Method	One 2.5-h	our written exan	nination (50% wei	ghting) together wit	h coursework a	assessment (50% v	veighting)		
Course Grade	A+ to F								
Grade Descriptors	A	their application	s through correctly a nd being able to carr	ng of key concepts and nalysing problems, cle y out computations car	arly and elegantl	y presenting correct lo	gical reasoning and		
	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	substantial inade		ey concepts and ideas t ne theorems through inc s.					
						appropriate theorems			
	Fail		oor and inadequate un complete the solution	iderstanding by not beir	ig able to identify	appropriate theorems of	r their applications, o		

Course Website http://hkumath.hku.hk/course/MATH1813/

		thematical ideas (6 credits)	Academic Year	2012					
Offering Department	Mathematic	Mathematics Quota							
Course Co-ordinator	Head of De	Head of Dept, Mathematics							
Course Aim	- To assist endeavour	int the students with the origin and growth of basic mathemating the students to gain a deeper insight and broader view of de the students with an opportunity to write on and talk nt study	mathematics as a dis	•					
Course Contents	students a	elected topics in the development of mathematics from ancient to modern times depending on interest of the tudents and the lecturer, with attention paid to the evolvement of mathematical ideas and the process of nathematical thinking and problem solving.							
Learning Outcomes	<ul> <li>understar</li> <li>recognize</li> <li>mathematie</li> <li>discuss, a</li> </ul>	sful completion of the course, students should be able to: d and describe the origin and development of basic mathema e and demonstrate the intellectual and the socio-cultural a cs as both an academic discipline and a human endeavour; irgue, and write about the development of various mathematic independent study on a topic about the history or developme	aspects of mathematic cal concepts and ideas;	· · · ·					
Pre-requisites	Pass in MA	TH1111 and MATH1211							
Offer in 2012 - 2013	Not offered		Examination	To be confirmed					
Offer in 2013 - 2014	Y								
Teaching Hours	36 hours of	lectures and student-centered learning							
Assessment Method	One 2.5-he weighting)	our written examination (50% weighting) plus assessment	of essays, talks and	discussions (50%					
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 original thought. Critical use of information from sources to draw appropriate and insightful conclusions. Actively engage in an contribute substantially and fruitfully to class discussions. Apply highly effective organizational and presentational skills.								
		original thought. Critical use of information from sources to draw appropriat	te and insightful conclusions.	Actively engage in and					
	В	original thought. Critical use of information from sources to draw appropriat	te and insightful conclusions. ctive organizational and prese critical abilities and logical t	Actively engage in and entational skills. hinking. Correct use of					
	B C	original thought. Critical use of information from sources to draw appropriat contribute substantially and fruitfully to class discussions. Apply highly effect Demonstrate substantial grasp of the subject. Evidence of analytical and information from sources to draw appropriate conclusions. Good partic	te and insightful conclusions. tive organizational and press critical abilities and logical t cipation in class discussion ne analytical and critical abilit draw appropriate conclusion	Actively engage in and entational skills. hinking. Correct use of s with generally good ies and logical thinking. s. Make some but not					
		original thought. Critical use of information from sources to draw appropriat contribute substantially and fruitfully to class discussions. Apply highly effec Demonstrate substantial grasp of the subject. Evidence of analytical and information from sources to draw appropriate conclusions. Good partic contributions. Apply effective organizational and presentational skills. Demonstrate general but incomplete grasp of the subject. Evidence of som Mostly correct but some erroneous use of information from sources to	te and insightful conclusions. ctive organizational and prese critical abilities and logical t cipation in class discussion the analytical and critical abilit draw appropriate conclusion ctive organizational and prese rmation, of the subject. Evid ed ability to use information	Actively engage in and antational skills. hinking. Correct use of s with generally good ies and logical thinking. s. Make some but not entational skills. ence of some coherent from sources to draw					
	С	original thought. Critical use of information from sources to draw appropriat contribute substantially and fruitfully to class discussions. Apply highly effec Demonstrate substantial grasp of the subject. Evidence of analytical and information from sources to draw appropriate conclusions. Good partic contributions. Apply effective organizational and presentational skills. Demonstrate general but incomplete grasp of the subject. Evidence of som Mostly correct but some erroneous use of information from sources to substantial fruitful contributions to class discussions. Apply moderately effe Demonstrate partial but limited grasp, with retention of some relevant info and logical thinking, but with limited analytical and critical abilities. Limit appropriate conclusions. Contribute only in a limited way to fruitful and m	te and insightful conclusions. tive organizational and press critical abilities and logical t cipation in class discussion me analytical and critical abilit draw appropriate conclusion ctive organizational and press rmation, of the subject. Evid ed ability to use information eaningful class discussions. tanding of the subject. Evid information from sources a	Actively engage in and entational skills. hinking. Correct use of s with generally good ies and logical thinking s. Make some but not entational skills. ence of some coherent from sources to draw Apply limited or barely ence of little or lack of and/or unable to draw					
Textbooks	C D Fail	original thought. Critical use of information from sources to draw appropriat contribute substantially and fruitfully to class discussions. Apply highly effect Demonstrate substantial grasp of the subject. Evidence of analytical and information from sources to draw appropriate conclusions. Good partic contributions. Apply effective organizational and presentational skills. Demonstrate general but incomplete grasp of the subject. Evidence of som Mostly correct but some erroneous use of information from sources to substantial fruitful contributions to class discussions. Apply moderately effe Demonstrate partial but limited grasp, with retention of some relevant info and logical thinking, but with limited analytical and critical abilities. Limit appropriate conclusions. Contribute only in a limited way to fruitful and m effective organizational and presentational skills. Demonstrate partial abilities, logical and coherent thinking. Misuse of appropriate conclusions. Make little or no meaningful contributions to class	te and insightful conclusions. tive organizational and press critical abilities and logical t cipation in class discussion me analytical and critical abilit draw appropriate conclusion ctive organizational and press rmation, of the subject. Evid ed ability to use information eaningful class discussions. tanding of the subject. Evid information from sources a	Actively engage in and entational skills. hinking. Correct use of s with generally good ies and logical thinking. s. Make some but not entational skills. ence of some coherent from sources to draw Apply limited or barely ence of little or lack of and/or unable to draw					
Textbooks References	C D Fail To be decid H. Eves ar Reinhart ar G. Polya: R. Laubenh R. Calinger C. Boyer: <i>A</i>	original thought. Critical use of information from sources to draw appropriat contribute substantially and fruitfully to class discussions. Apply highly effec Demonstrate substantial grasp of the subject. Evidence of analytical and information from sources to draw appropriate conclusions. Good partic contributions. Apply effective organizational and presentational skills. Demonstrate general but incomplete grasp of the subject. Evidence of som Mostly correct but some erroneous use of information from sources to substantial fruitful contributions to class discussions. Apply moderately effe Demonstrate partial but limited grasp, with retention of some relevant info and logical thinking, but with limited analytical and critical abilities. Limit appropriate conclusions. Contribute only in a limited way to fruitful and m effective organizational and presentational skills. Demonstrate evidence of little or no grasp of the knowledge and unders analytical and critical abilities, logical and coherent thinking. Misuse of appropriate conclusions. Make little or no meaningful contributions to class are minimally effective or ineffective.	te and insightful conclusions. ctive organizational and prese critical abilities and logical t izipation in class discussion: he analytical and critical abilit draw appropriate conclusion ctive organizational and pres rmation, of the subject. Evid e ability to use information eaningful class discussions. tanding of the subject. Evid information from sources a s discussions. Organization a hdamental Concepts of -Verlag, 1999) )	Actively engage in and antational skills. hinking. Correct use of s with generally good ies and logical thinking s. Make some but not entational skills. ence of some coherent from sources to draw Apply limited or barely ence of little or lack of and/or unable to draw and presentational skills					

MATH2002 Mathema	MATH2002 Mathematics seminar (6 credits) Academic Year							
Offering Department	Mathematics	Quota	12					
Course Co-ordinator	Dr T W Ng, Mathematics							
Course Aim	This is a seminar style course intended for those who have veri mathematics. Students will be given book chapters and elementary re make presentations in front of the whole class. Individual meetings we their presentations. Active participation in all the discussions is expected learn how to initiate self/independent study in mathematics.	esearch articles for privat ith the instructors will be	e study and then arranged prior to					
Course Contents	Topics chosen by the instructors, including chapters from books and ele	ementary research articles						
Learning Outcomes	On successful completion of the course, students should be able to - initiate private independent study on some interesting mathematical to	pics.						
Pre-requisites	Pass in (MATH1001, MATH1111 and MATH1211); or Pass in (MATH1001 and MATH1111) and already enrolled in MATH121 Pass in MATH1001; and MATH1211) and already enrolled in MATH111 (This course is for first year BSc students only.)							

Offer in 2012 - 2013	2nd sem	1	Examination	Мау				
Offer in 2013 - 2014	N							
Teaching Hours	Meeting	of the whole class for two hours each teaching week, plus individu	ual meetings with the ir	structors.				
Assessment Method		ne 2-hour written examination (30%); coursework assessment (70%), based on class presentations, participation discussions and a written report						
Course Grade	A+ to F							
Grade Descriptors	А		Demonstrate thorough grasp of the subject. Show strong analytical and critical abilities and logical thinking, with evidence original thought. Actively engage in and contribute substantially and fruitfully to class discussions. Apply highly effectiv organizational and presentational skills.					
	в	Demonstrate substantial grasp of the subject. Evidence of analytical and critical abilities and logical thinking. Good participal in class discussions with generally good contributions. Apply effective organizational and presentational skills.						
	С	C Demonstrate general but incomplete grasp of the subject. Evidence of some analytical and critical abilities and logical Make some but not substantial fruitful contributions to class discussions. Apply moderately effective organization presentational skills.						
	D	Demonstrate partial but limited grasp, with retention of some relevant inform and logical thinking, but with limited analytical and critical abilities. Contribu class discussions. Apply limited or barely effective organizational and presen	te only in a limited way to f					
	Fail	Demonstrate evidence of little or no grasp of the knowledge and understanding of the subject. Evidence of little or lack analytical and critical abilities, logical and coherent thinking. Make little or no meaningful contributions to class discussion Organization and presentational skills are minimally effective or ineffective.						
Course Website	http://hku	umath.hku.hk/course/MATH2002/						
Remarks	Enrollme	ent needs instructors' approval. This course is for first year BSc sto	udents only.					

MATH2201 Introduc	tion to ma	athem	natical ana	iysis (6 cre	edits)		Academic Year	2012		
Offering Department	Mathemat	Mathematics Quota								
Course Co-ordinator	Dr J T Cha	han, Ma	athematics							
Course Aim	To introdu	luce stu	udents to the	basic ideas	and techniques	of mathematical and	alysis.			
Course Contents	densenes - Sequence - Continu intermedia - Differen application	ss of the nces and es and uity of iate val entiation ons tion: co	ne rational nu nd series of Cauchy seq f real-valued lue theorem, n: properties onstruction of	umbers real numbe uences, subs functions: uniform con of differen	rs: limits of sec sequences, serie properties of o tinuity, limits of f tiable functions	uences, properties s, tests of converge continuous function unctions , the mean value	and infimum, the co of convergent sequence for series s, the extreme va theorem, Taylor's and Riemann sums	uences, monoto lue theorem, t theorem and		
Learning Outcomes	<ul> <li>comphree</li> <li>demonstand</li> <li>sequence</li> <li>elucidate</li> <li>value theorem</li> </ul>	ehend nstrate es/serie te impo eorem;	and use abs convergenc es; ortant proper	stract mathen ce or non-o	convergence of nuous functions	s such as the epsilo a sequence/serio	es using propertie ne value theorem ar	Ū		
Pre-requisites	Pass in M	MATH1	211 or MATH	H1805 or MA	TH1813					
Offer in 2012 - 2013	1st sem	2nd s	sem				Examination	Dec May		
Offer in 2013 - 2014	Y									
Teaching Hours	36 hours of	of lect	ures and stu	dent-centere	d learning					
Assessment Method	One 2.5-h	hour w	ritten examir	nation (50% v	weighting) togeth	ner with coursework	assessment (50% v	veighting)		
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.									
	B Demonstrate a substantial command of the mathematical notions and proof techniques taught in the course by being able to handle abstract mathematical arguments, to apply appropriate theorems correctly, and, with guidance, to make use of those proof techniques in novel situations. Ability to present solutions clearly and logically, and evidence of innovative ideas in solving problems are expected.									
	С	C Demonstrate a good understanding of the mathematical notions and proof techniques taught in the course by being able to handle abstract mathematical arguments and to apply appropriate theorems correctly. Ability to present solutions clearly and logically is expected.								
	D						ne course by being able e leading to complete sol			
	Fail			and inadequate the theorems co		not being able to identif	y appropriate theorems	or applications, or		
Textbooks	To be dec	cided b	by the course	e instructor.						
	Flomente									
References	Elemental	ary Ana	alysis: The Tl	heory of Calo	ulus, by Kennet	h A. Ross, 1980, Sp	pringer			

0″	I (6 credits)			Academic Year	2012		
Offering Department	Mathematic	\$		Quota			
Course Co-ordinator	Dr Y K Lau	Dr Y K Lau, Mathematics					
Course Aim	in mathem	aims to present those fundamentics and the applied sciences. pplied Discrete Mathematics.					
Course Contents	homomorpl Rings: exa domains. Fields: defi	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.					
Learning Outcomes	- write dow - give exam	On successful completion of the course, students should be able to: - write down the precise definitions of the basic concepts in the "Course Conents"; - give examples for each of the concepts in the "Course Conents"; - understand basic properties of groups, rings, and fields.					
Pre-requisites	(MATH110	ATH1101 and MATH1102) or and MATH1201) or (MATH11 or MATH1811 or MATH1812 or	02 and MATH1202) or MATH				
Offer in 2012 - 2013	1st sem			Examination	Dec		
Offer in 2013 - 2014	Y						
Teaching Hours	36 hours of	lectures and student-centered le	arning				
Assessment Method	One 2.5-hc	r written examination (50% weig	ting) together with courseworl	k assessment (50% w	eighting)		
Course Grade	A+ to F						
Grade Descriptors	A	A Demonstrate an excellent understanding of key concepts and ideas by being able to identify the appropriate theorems and their applications through correctly analysing problems, clearly and elegantly presenting correct logical reasoning and argumentation and being able to carry out computations carefully and correctly, and with some innovative approaches to solving problems.					
	В	Demonstrate a good understanding of key concepts and ideas by being able to identify the appropriate theorems and their applications through correctly analysing problems, but with some minor inadequacies in arguments, identifying the appropriate theorems or their applications and presentation or with some minor computational errors.					
			entation or with some minor computation	onal errors.			
	С		ling of key concepts and ideas by being ing the theorems through incorrectly	g able to correctly identify	appropriate theorems,		
	C D	theorems or their applications and prese Demonstrate an acceptable understand but with some inadequacies in apply	ting of key concepts and ideas by bein ing the theorems through incorrectly putational errors. any concepts and ideas by being able to e theorems through incorrectly analysis	g able to correctly identify analysing problems with correctly identify appropria	appropriate theorems, poor argument and ate theorems, but with		
		theorems or their applications and press Demonstrate an acceptable understand but with some inadequacies in apply presentation or a number of minor comp Demonstrate some understanding of ke substantial inadequacies in applying th	ting of key concepts and ideas by bein ing the theorems through incorrectly putational errors. ay concepts and ideas by being able to e theorems through incorrectly analysis derstanding by not being able to identi	g able to correctly identify analysing problems with correctly identify appropria ng problems with poor arg	appropriate theorems, poor argument and ate theorems, but with ument or presentation		
Textbooks	D Fail	théorems or their applications and prese Demonstrate an acceptable understand but with some inadequacies in apply presentation or a number of minor comp Demonstrate some understanding of ke substantial inadequacies in applying th or with substantial computational errors. Demonstrates poor and inadequate uni-	ting of key concepts and ideas by bein ing the theorems through incorrectly putational errors. ay concepts and ideas by being able to e theorems through incorrectly analysis derstanding by not being able to identi	g able to correctly identify analysing problems with correctly identify appropria ng problems with poor arg	appropriate theorems, poor argument and ate theorems, but with ument or presentation		
Textbooks References	D Fail To be decid S. Lang: Ur J.B. Fraleig I.N. Herstei	theorems or their applications and press Demonstrate an acceptable understand but with some inadequacies in apply presentation or a number of minor comp Demonstrate some understanding of ke substantial inadequacies in applying the or with substantial computational errors. Demonstrates poor and inadequate une not being able to complete the solution.	ting of key concepts and ideas by being ing the theorems through incorrectly putational errors. ay concepts and ideas by being able to e theorems through incorrectly analysin derstanding by not being able to identi 2004) ebra (Addison-Wesley, 1989, 4t II, 1996)	g able to correctly identify analysing problems with correctly identify appropria ng problems with poor arg ify appropriate theorems o th edition)	appropriate theorems, poor argument and ate theorems, but with ument or presentation r their applications, or		

MATH2303 Matrix th	eory and its applications (6 credits)	Academic Year	2012					
Offering Department	Mathematics	Quota						
Course Co-ordinator	Dr Fullwood, Mathematics	Dr Fullwood, Mathematics						
Course Aim	Matrix theory has a close connection with other mathematical subjects such and combinatorics. It also plays an important role in the development of ma and social sciences. In this course, students will be taught the fundamentals to various kinds of practical problems. Mathematical software may be used learn how to use the computer to solve matrix problems.	any subjects in scien of matrix analysis a	nce, engineering, nd its application					
Course Contents	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.							
Learning Outcomes	On successful completion of the course, students should be able to: - have a good understanding on matrices, determinants, linear transformations, eigenvalues and eigenvectors; - understand the concept of similar matrices and the eigenvalue decomposition; - understand the concept of orthogonality; - understand the concept of unitary, normal, and Hermitian matrices; - find the singular value decomposition of a matrix and apply the theory of singular values to study pol decomposition, pseudo inverse and spectral norm of matrices; - understand the concept of the Jordan blocks, Jordan matrices and the Jordan canonical form of a matrix.							
Pre-requisites	Pass in (MATH1101 and MATH1102) or MATH1111 or MATH1803 or MATH MATH1812 or MATH1813	1804 or MATH1805	or MATH1811 o					

Offer in 2012 - 2013	1st sem	1st sem Examination Dec					
Offer in 2013 - 2014	Y	Y					
Teaching Hours	36 hours	36 hours of lectures and student-centered learning					
Assessment Method		One 2.5-hour written examination (50% weighting) together with coursework assessment (50% weighting) based mainly on class tests and/or assignments.					
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	Demonstrates poor and inadequate understanding by not being able to not being able to complete the solution.	identify appropriate theorems o	r their applications, or			
Textbooks	To be de	cided by the course instructor.					
References	Steven J Chris Ro 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 - Hall, 1995)					
Course Website	http://hku	math.hku.hk/course/MATH2303/					

MATH2304 Introduc	tion to num	nber theory (6 credits)	Academic Year	2012			
Offering Department	Mathemati	CS	Quota				
Course Co-ordinator	Prof K M T	sang, Mathematics					
Course Aim	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 furthe 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	Euclidean reminder th the quadra number the numbers w	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 reminder 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.					
Learning Outcomes	- solve a sy - solve poly - determine - determine - understar	sful completion of the course, students should be able to: ystem of linear congruences; ynomial congruences; e the solubility of quadratic congruences by computation of Leg e the existence of primitive roots and use them in solving some nd the prime number theorem; nding some longstanding problems in number theory.		95;			
Pre-requisites		ATH1101 and MATH1102) or (MATH1111 and MATH1211); an ATH2301, or already enrolled in this course.	d				
Offer in 2012 - 2013	2nd sem		Examination	May			
Offer in 2013 - 2014	Y						
Teaching Hours	36 hours o	f lectures and student-centered learning					
Assessment Method	One 2.5-ho	our written examination (50% weighting) together with coursewo	ork assessment (50% w	eighting)			
Course Grade	A+ to F						
Grade Descriptors	A 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.						
	B 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.						
	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 weak and fragmentary argument and presentation, or with moderate computational errors.						
	C	argument and presentation, or with moderate computational errors.					
	D	argument and presentation, or with moderate computational errors. Demonstrate some superficial understanding of key concepts and ideas theorems, but with substantial inadequacies in applying the theorems the argument or presentation, or with substantial computational errors.					

	Fail theorems or their applications, or not being able to complete the solution.
Textbooks	To be decided by the course instructor.
References	David M. Burton, Elementary Number Theory, McGraw-Hill Higher Education, International Edition. T.M. Apostol, Introduction to Analytic Number Theory, Springer International Student Edition. A. Baker, A Concise Introduction to the Theory of Numbers, Cambridge University Press, Cambridge.
Course Website	http://hkumath.hku.hk/course/MATH2304/

MATH2401 Analysis	I (6 credit	its)							Academic Year	2012	
Offering Department	Mathemat	atics						(	Quota		
Course Co-ordinator	Prof W S	Prof W S Cheung, Mathematics									
Course Aim							basic results tudies in mat		in Calculus and al analysis.	introduces s	some
Course Contents	boundary	Basic properties of metric spaces; openness; closedness; interior point; adherent point; accumulation point; boundary point; compactness; completeness; continuity; connectedness; pathwise connectedness; uniform convergence; Banach's fixed point theorem.									
Learning Outcomes	<ul> <li>demonst</li> <li>(e.g., able</li> <li>apply kn</li> <li>way (e.g.,</li> <li>think cre</li> </ul>	On successful completion of the course, students should be able to: - demonstrate knowledge and understanding of the basic features of mathematical analysis and point set topology (e.g., able to identify objects that are topological equivalent); - apply knowledge and skills acquired in mathematical analysis to analyze and handle novel situations in a critical way (e.g., able to determine whether a specific function is uniformly continuous); - think creatively and laterally to generate innovative examples and solutions to non-standard problems (e.g., able to provide counterexamples to inaccurate mathematical statements).									
Pre-requisites	or MATH1	Pass in (MATH1201 and MATH1202) or MATH1211 or MATH1803 or or MATH1804 or MATH1805 or MATH181 or MATH1812 or MATH1813; and Pass in MATH2201, or already enrolled in this course.									
Offer in 2012 - 2013	1st sem							I	Examination	Dec	
Offer in 2013 - 2014	Y										
Teaching Hours	36 hours o	s of lea	ectures and s	student-cente	ered learn	ing. Tutori	ials will also b	be arrang	ed if necessary.		
Assessment Method	One 2.5-h	-hour	written exar	mination (50%	% weightir	ng) togeth	er with course	ework as	sessment (50% v	veighting)	
Course Grade	A+ to F										
Grade Descriptors	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.									
	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 Demonstrates poor and inadequate understanding by not being able to identify appropriate theorems or their applications, or not being able to complete the solution.										
Textbooks	To be dec	ecided	d by the cou	rse instructo	r.						
References			nematical An ples of Mathe	alysis ematical Ana	lysis						
Course Website	http://hkur	umath	h.hku.hk/cou	Irse/MATH24	401/						

MATH2402 Analysis	II (6 credits)	Academic Year	2012			
Offering Department	Mathematics	Quota				
Course Co-ordinator	Dr P P W Wong, Mathematics					
Course Aim	This course gives a comprehensive and rigorous treatment on calculus of several variables, and a modern treatment of integration theory in the language of differential forms which is essential for more advanced studies in analysis and geometry.					
Course Contents	Differentiation of functions of several variables: partial derivatives, differential, differentiability, inverse function 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					
Learning Outcomes	<ul> <li>On successful completion of the course, students should be able to:</li> <li>- demonstrate knowledge and understanding of the modern language of mathematical analysis and geometry (e.g able to manipulate differential forms);</li> <li>- apply knowledge and skills acquired in mathematical analysis to analyze and handle novel situations in a critica way (e.g., able to determine the differentiability and integrability of specific functions);</li> </ul>					

	- think creatively and laterally to generate innovative solutions to novel problems (e.g., able to do integration of specific functions on chains).						
Pre-requisites	Pass in ((MATH1201 and MATH1202) and (MATH1101 or MATH1102)) or (MATH1111 and MATH1211) or MATH1803 or MATH1804 or MATH1805 or MATH1811 or MATH1812 or MATH1813; and Pass in MATH2201, or already enrolled in this course; and Pass in MATH2401, or already enrolled in this course.						nd MATH1211) or
Offer in 2012 - 2013	2nd sem					Examination	May
Offer in 2013 - 2014	Y						
Teaching Hours	36 hours o	of lectures and	d student-centered	learning			
Assessment Method	One 2.5-ho	our written ex	amination (50% w	eighting) together	with coursework	assessment (50% v	veighting)
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.					
	Demonstrate some understanding of key concepts and ideas by being able to correctly identify appropriate theorems, but with substantial inadequacies in applying the theorems through incorrectly analysing problems with poor argument or presentation or with substantial computational errors.						
	Fail Demonstrates poor and inadequate understanding by not being able to identify appropriate theorems or their applications, or not being able to complete the solution.					or their applications, or	
Textbooks	To be deci	ided by the co	ourse instructor.				
References	Apostol: Mathematical Analysis Munkres: Analysis on Manifolds Rudin: Principles of Mathematical Analysis Spivak: Calculus on Manifolds						
Course Website	http://hkum	nath.hku.hk/c	ourse/MATH2402	/			

MATH2403 Function	ns of a com	plex variable (6 credits)	Academic Year	2012				
Offering Department	Mathemati	cs	Quota					
Course Co-ordinator	Prof N Mol	Prof N Mok, Mathematics						
Course Aim	This course is indispensable for studies in higher mathematical analysis and the more theoretical aspects of physics. In this course, the students are introduced to the fundamental concepts and properties of analytic functions and are shown how to look at analyticity from different points of view. At the same time, the techniques of solving problems without losing sight of the geometric picture are emphasized.							
Course Contents	Complex number system. Analytic functions and elementary functions. The Cauchy-Riemann equations. Cauchy' theorem and its applications. Taylor's series. Laurent's series. Zeros, singularities and poles. The Residue Theorem and its applications.							
Learning Outcomes	<ul> <li>recognize</li> <li>grasp the study analy</li> <li>compute</li> </ul>	On successful completion of the course, students should be able to: - recognize the theory of functions of a complex variable as a rigorous and foundational subject in mathematics; - grasp the techniques from Cauchy-Riemann equations, power series expansion and Cauchy integral formulas to study analytic functions from different perspectives; - compute contour integrals by calculating residues; - apply such techniques to determine improper integrals such as those for certain rational functions on the real line						
Pre-requisites	(MATH110 MATH180	MATH1101 and MATH1102) or (MATH1101 and MATH1201) 12 and MATH1201) or (MATH1102 and MATH1202) or MATH 5 or MATH1811 or MATH1812 or MATH1813; and ATH2201, or already enrolled in this course.						
Offer in 2012 - 2013	1st sem		Examination	Dec				
Offer in 2013 - 2014	Y							
Teaching Hours	36 hours o	f lectures and student-centered learning						
Assessment Method	One 2.5-ho	our written examination (50% weighting) together with coursework	assessment (50% w	eighting)				
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.							
	В			appropriate				
	в С		nal errors. able to correctly identify a	appropriate theorems				

		or with substantial computational errors.				
	Fail Demonstrates poor and inadequate understanding by not being able to identify appropriate theorems or their not being able to complete the solution.					
Textbooks	To be de	ecided by the course instructor.				
References	L.V. Ahl J. Bak &	chmarsh: The Theory of Functions (OUP) fors: Complex Analysis (McGraw-Hill, 3rd edition) a D.J. Newman: Complex Analysis, Undergraduate Texts in Mathematics (Springer-Verlag) ira: Introduction to Complex Analysis (Cambridge)				
Course Website	http://hkumath.hku.hk/course/MATH2403/					

	tial equation							
Offering Department	Mathematic	х Х	Quota					
Course Co-ordinator	Prof J H Lu	Prof J H Lu, Mathematics						
Course Aim	importance	ard topics in the wide field of ordinary differential equations (C to students of mathematics and sciences. Our emphasis is s and our approach is a compromise between diversity and depth.	s on principles rat					
Course Contents	Review of elementary differential equations. Existence and uniqueness theorems. Second order differential equations, Wronskian, variation of parameters. Power series method, Legendre polynomials, Bessel functions. The Laplace transform. Linear systems, autonomous systems. Qualitative properties of solutions.							
Learning Outcomes	<ul> <li>solve sim equations,</li> <li>solve sys number of u</li> <li>discuss of approximat</li> </ul>	On successful completion of the course, students should be able to: - solve simple first order and second order (linear or nonlinear) ODEs by various techniques, including auxiliary equations, variation of parameters, Laplace transform, and series method; - solve systems of first order linear ODEs with constant coefficients, of which the number of equations and the number of unknown functions are no more than three; - discuss qualitatively the solutions of nonlinear ODEs or systems of nonlinear ODEs by studying their linear approximations or their phase diagrams; - apply the theory of differential equations to study quantitatively/qualitatively problems from physical and life sciences.						
Pre-requisites	(MATH110	/ATH1101 and MATH1102) or (MATH1101 and MATH1201) 2 and MATH1201) or (MATH1102 and MATH1202) or MATH1 4 or MATH1805 or MATH1811 or MATH1812 or MATH1813						
Offer in 2012 - 2013	2nd sem		Examination	Мау				
Offer in 2013 - 2014	Y							
Teaching Hours	36 hours of	i lectures and student-centered learning						
Assessment Method	One 2.5-ho	our written examination (50% weighting) together with coursework a	assessment (50% v	eighting)				
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.						
	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.							
	С	but with some inadequacies in applying the theorems through incorrectly a						
	C D	but with some inadequacies in applying the theorems through incorrectly a	nalysing problems with orrectly identify appropri	poor argument and ate theorems, but with				
		but with some inadequacies in applying the theorems through incorrectly a presentation or a number of minor computational errors. Demonstrate some understanding of key concepts and ideas by being able to consubstantial inadequacies in applying the theorems through incorrectly analysing	nalysing problems with orrectly identify appropri problems with poor arg	poor argument and ate theorems, but with ument or presentation				
Textbooks	D Fail	but with some inadequacies in applying the theorems through incorrectly a presentation or a number of minor computational errors. Demonstrate some understanding of key concepts and ideas by being able to cc substantial inadequacies in applying the theorems through incorrectly analysing or with substantial computational errors. Demonstrates poor and inadequate understanding by not being able to identify	nalysing problems with orrectly identify appropri problems with poor arg	ate theorems, but with				
Textbooks References	D Fail To be decid W.E. Boyce edition) E.A. Coddin	but with some inadequacies in applying the theorems through incorrectly a presentation or a number of minor computational errors. Demonstrate some understanding of key concepts and ideas by being able to consubstantial inadequacies in applying the theorems through incorrectly analysing or with substantial computational errors. Demonstrates poor and inadequate understanding by not being able to identify not being able to complete the solution.	nalysing problems with orrectly identify appropri problems with poor arg appropriate theorems o dary Value Problem -Hall)	poor argument and ate theorems, but wit ument or presentatio r their applications, c				

MATH2408 Computa applications (6 credi	Academic Year	2012			
Offering Department	Mathematics	Quota			
Course Co-ordinator	Dr W K Ching, Mathematics				
Course Aim	This course covers topics in the fields of differential equations and numerical analysis which are of importance to sciences students. The emphasis is practical applications of basic principles.				
Course Contents	Numerical differentiation and integration. Solution of nonlinear systems of equations. Elementary differential equations. Power series method. Numerical solutions of ordinary and partial differential equations. Numerical				

	solutions	solutions of systems of first-order ordinary differential equations.								
Learning Outcomes	<ul> <li>construct nonlinear</li> <li>explain r</li> <li>construct differentiat</li> <li>construct stability and</li> </ul>	sful completion of the course, students should be abl t and implement numerical methods for numerical system of equations; nathematical ideas of numerical methods in solving of c one-step and linear multistep methods for the num equations and systems of such equations and analy t finite difference methods for the numerical solution d accuracy properties; nt numerical methods for solving initial and boundary	integration and rdinary and par herical solution ze their stability n of partial diffe	tial differential equ of initial-value pro and accuracy pro erential equations	ations; blems for ordinary perties; and analyze their					
Pre-requisites	Pass in M	ATH1111 or MATH1211 or MATH1611 or MATH1803	3 or MATH1804	or MATH1805 or	MATH1813					
Offer in 2012 - 2013	2nd sem			Examination	Мау					
Offer in 2013 - 2014	Y									
Teaching Hours	36 hours of	f lectures and student-centered learning								
Assessment Method	One 2.5-h	One 2.5-hour written examination (50% weighting) together with coursework assessment (50% weighting)								
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 computational methods and their applications through correctly analysing problems, clearly and elegantly presenting correct logical reasoning and argumentation and being able to carry out computations carefully and correctly, and with some innovative approaches to solving problems.								
	В	B Demonstrate a good understanding of key concepts and ideas by being able to identify the appropriate theorems and computational methods and their applications through correctly analysing problems, but with some minor inadequacies in arguments, identifying the appropriate theorems and computational methods or their applications and presentation or with some minor computational errors.								
	с	C Demonstrate an acceptable understanding of key concepts and ideas by being able to correctly identify appropriate theorems and computational methods, but with some inadequacies in applying them through incorrectly analysing problems with poor argument and presentation or a number of minor computational errors.								
	D	Demonstrate some understanding of key concepts and ideas by being able to correctly identify appropriate theorems and computational methods, but with substantial inadequacies in applying them through incorrectly analysing problems with poor argument or presentation or with substantial computational errors.								
	Fail	Fail Demonstrates poor and inadequate understanding by not being able to identify appropriate theorems and computational methods or their applications, or not being able to complete the solution.								
Textbooks	To be dec	ded by the course instructor.								
References	E.A. Codo	D.F. Parkhurst: Introduction to Applied Mathematics for Environmental Science (Springer) E.A. Coddington: An Introduction to Ordinary Differential Equations (Prentice-Hall) A. Ralston and P. Rabinowitz: A First Course in Numerical Analysis (McGraw-Hill)								
Course Website	http://hkur	nath.hku.hk/course/MATH2408/								

MATH2600 Discrete	mathemat	cs (6 credits)		Academic Year	2012					
Offering Department	Mathemat	Aathematics Quota								
Course Co-ordinator	Prof W Za	Prof W Zang, Mathematics								
Course Aim	To introdu	e students to the basic	ideas and techniques of discrete	e mathematics.						
Course Contents	generating - Graph th	Counting: combinations, permutations, pigeonhole principle, inclusion-exclusion, recurrence relations, and enerating functions Graph theory: paths, circuits, trees, connectivity, planarity, etc. Applications of counting techniques and graph theory								
Learning Outcomes	<ul> <li>demonst</li> <li>solve var</li> </ul>	n successful completion of the course, students should be able to: demonstrate knowledge and understanding of the basic ideas and techniques of discrete mathematics; solve various real-world problems by using counting techniques and graph theory; develop their ability to read, comprehend, and create mathematical arguments.								
Pre-requisites		Pass in any two of MATH1XXX level or MATH2XXX or MATH3XXX level courses; and Not for students who hav already passed MATH1800 before.								
Offer in 2012 - 2013	1st sem			Examination	Dec					
Offer in 2013 - 2014	Y									
Teaching Hours	36 hours o	lectures and student-c	centered learning							
Assessment Method	One 2.5-h	ur written examination	(50% weighting) together with co	oursework assessment (50%	weighting)					
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.								
	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	Demonstrates poor and inadequate understanding by not being able to identify appropriate theorems or their applications, or not being able to complete the solution.	
Textbooks	K H Rosen	Discrete Mathematics and its Applications (McGraw-Hill, 2007)	
Course Website	http://hkum	ath.hku.hk/course/MATH2600/	

MATH2601 Numeric	al analysi	is (6 cre	edits)		Acade	mic Year	2012		
Offering Department	Mathema	Mathematics Quota							
Course Co-ordinator	Dr K H C	Dr K H Chan, Mathematics							
Course Aim			rs both the theoretical merical methods of solu			s. Emphasis	s will be on basic		
Course Contents			Polynomial interpolati ems. Numerical differe				rative methods fo		
Learning Outcomes	<ul> <li>construct</li> <li>point iterative</li> <li>construct</li> <li>construct</li> <li>construct</li> <li>apply th</li> <li>solve initial</li> </ul>	In successful completion of the course, students should be able to: construct and implement algorithms to find the zeros of functions, apply the bisection, Newton, secant and fixed oint iteration methods; construct and implement Newton's method to find the roots of a system of nonlinear equations; construct interpolation polynomials in Lagrange, Newton, Hermit and spline forms; apply the basic numerical integration and differentiation methods; solve initial value problems using Taylor series and Runge-Kutta methods of varying orders; use software package such as Scilab to solve numerical problems.							
Pre-requisites	Pass in M Pass in (I	MATH120 (MATH18	01 and (MATH1101 or I 02 and (MATH1101 or I 11 or MATH1803) or (N 11 or MATH1211 or MA	MATH1102 or MATH12 MATH1812 or MATH18	201); or 03); or				
Offer in 2012 - 2013	1st sem				Exami	nation	Dec		
Offer in 2013 - 2014	Y								
Teaching Hours	36 hours	s of lectur	es and student-centere	d learning					
Assessment Method	One 2.5-ł	-hour writ	ten examination (50% v	weighting) together with	n coursework assessm	ent (50% w	eighting)		
Course Grade	A+ to F								
Grade Descriptors	A Demonstrate an excellent understanding of key concepts and methods by being able to identify the 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 numerical procedures carefully and correctly, and with some innovative approaches to solving problems.								
	B Demonstrate a good understanding of key concepts and methods by being able to identify the appropriate theorems/algorithms and their applications through correctly analysing problems, but with some minor inadequacies in arguments, identifying the appropriate algorithms or their applications or with some minor computational errors.								
	C Demonstrate an acceptable understanding of key concepts and methods by being able to correctly identify appropriate theorems/algorithms, but with some inadequacies in applying the theorems/methods through incorrectly analysing problems with poor argument and presentation or with a number of minor computational errors.								
	Demonstrate some understanding of key concepts and methods by being able to correctly identify appropriate theorems/algorithms, but with substantial inadequacies in applying the theorems/methods through incorrectly analysing problems with poor argument and presentation or with substantial computational errors.								
	Fail		nstrates poor and inadequa ations, or not being able to co		ing able to identify appro	priate theorem	s/algorithms or their		
Textbooks	To be dee	ecided by	the course instructor.						
		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)							
References					, , ,				
References Course Website	K. E. Atki	kinson: Ar		ical Analysis (Wiley, 19	, , ,				

MATH2603 Probabil	ity theory (6 credits)	Academic Year	2012					
Offering Department	Mathematics Quota							
Course Co-ordinator	Dr J Tsai, Mathematics							
Course Aim	The emphasis of this course will be on probability models and their applications. The primary aim is to elucidate the fundamental principles of probability theory through examples and to develop the ability of the students to apply what they have learned from this course to widely divergent concrete problems.							
Course Contents	<ul> <li>Basic probability theory and decision theory: discrete probability distribution conditional probability, expectation, variance, moment generating function decision analysis, decision tree method</li> <li>Poisson process and reliability theory: exponential distribution, Markov pr reliability, components in series, components in parallel, maintenance models</li> <li>Markov chain theory: concepts of states and transition probability, applications in marketing and genetic problems, branching process, other Ma</li> <li>Inventory theory: concepts of EOQ, lead time effect, newsboy models, stoch</li> </ul>	n, limit theorems, operty, Poisson pro s irreducibility, statio rkov models	Bayes' Theorem, cess, concepts of nary distribution,					
Learning Outcomes	On successful completion of the course, students should be able to:							

	<ul> <li>- understand the fundamental principles of probability theory;</li> <li>- explain the typical proofs and computational techniques in probability theory and apply them problems;</li> <li>- demonstrate knowledge and understanding of various types of probability models.</li> </ul>										
Pre-requisites		Pass in (MATH0801 and MATH0802) or (MATH1201 and MATH1202) or (MATH1811 and MATH1812) or MATH1111 or MATH1211 or MATH1803 or MATH1804 or MATH1805 or MATH1813									
Offer in 2012 - 2013	1st sem					Examination	Dec				
Offer in 2013 - 2014	Y										
Teaching Hours	36 hours	s of lectures a	and student-centered	learning							
Assessment Method	One 2.5-	One 2.5-hour written examination (50% weighting) together with coursework assessment (50% weighting)									
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. Demonstrate a good understanding of key concepts and ideas by being able to identify the appropriate theorems and their										
	B 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 Demonstrates poor and inadequate understanding by not being able to identify appropriate theorems or their applications, or not being able to complete the solution.										
Textbooks	To be de	ecided by the	course instructor.								
References	S. M. Ro	oss: Introducti	ion to Probability Mo	dels (Academic Pres	s, 2007, 9th ed	.)					
Course Website	http://hku	umath.hku.hk	/course/MATH2603/								

MATH2901 Operatio	ns researc		intoj		Aud	emic Year	2012		
Offering Department	Mathemati	Mathematics Quota							
Course Co-ordinator	Prof S C K	K Chu, Mathe	ematics						
Course Aim	and its rel algorithms	The objective is to provide a fundamental account of the basic results and techniques of linear programming (LF 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 concep and background for more advanced studies in operations research.							
Course Contents	Linear Pro	ogramming. N	Matrix game. Goal pr	ogramming.					
Learning Outcomes	<ul> <li>understa</li> <li>operations</li> <li>demons</li> <li>extensions</li> </ul>	n successful completion of the course, students should be able to: understand the fundamental concept and approach of linear programming appropriate to the further study verations research; demonstrate knowledge and understanding of the underlying techniques of the Simplex Method and it tensions such as the revised Simplex and dual Simplex algorithms; understand and apply the theory of LP duality such as in the theory and computations of matrix games.							
Pre-requisites	Pass in M	Pass in MATH1101 and (MATH1102 or MATH1201 or MATH1202); or Pass in MATH1102 and (MATH1101 or MATH1201 or MATH1202); or Pass in MATH1111 or MATH1211 or MATH1804 or MATH1805 or MATH1813.							
Offer in 2012 - 2013	1st sem				Exam	nination	Dec		
Offer in 2013 - 2014	Y								
Teaching Hours	36 hours o	of lectures ar	nd student-centered	learning					
Assessment Method	final exam	n can be sch	eduled in the origina	ement method of 50% of al assessment period. O ad of the teaching period	therwise, the final				
Course Grade	A+ to F								
Grade Descriptors	A Demonstrate an excellent understanding of key concepts and ideas by being able to identify basic principles, appropriate theorems, algorithms and their applications through correctly analysing problems, clearly and elegantly presenting correct logical reasoning and argumentation and being able to carry out computations carefully and correctly, and to solve problems with some innovative approaches.								
	B Demonstrate a good understanding of key concepts and ideas by being able to identify basic principles, appropriate theorems, algorithms and their applications through correctly analysing problems, but with some minor inadequacies in arguments, identifying the appropriate theorems or their applications and presentation or with some minor computational errors.								
	C Demonstrate an acceptable understanding of key concepts and ideas by being able to identify basic principles, appropriate theorems, algorithms and their applications but with some inadequacies in applying the theorems through incorrectly analysing problems with poor argument and presentation or a number of minor computational errors.								
	D Demonstrate some understanding of key concepts and ideas by being able to identify basic principles, appropriate theorems, algorithms and their applications but with substantial inadequacies in applying the theorems through incorrectly analysing problems with poor argument or presentation or with substantial computational errors.								
	Fail Demonstrates 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.								

Textbooks	To be decided by the course instructor.
References	J.P. Ignizio and T.M. Cavalier: Linear Programming (Prentice-Hall International, 1994) J.P. Ignizio: Goal Programming and Extensions (Lexington Books, 1976) H.A. Taha: Operations Research (Prentice-Hall International, 7/e 2003) P.R. Thie: An Introduction to Linear Programming and Game Theory (Wiley 2/e 1988) W.L. Winston: Introduction to Mathematical Programming (Duxbury 4/e 2003)
Course Website	http://hkumath.hku.hk/course/MATH2901/

MATH2904 Introduc	tion to op	ptimiz	zation (6 cro	edits)				Academic Year	2012
Offering Department	Mathema	<i>l</i> athematics						Quota	
Course Co-ordinator	Prof W Za	Prof W Zang, Mathematics							
Course Aim			troduces stud rations resear					, aiming at prepari areas.	ng them for furthe
Course Contents			l and constra lity. Algorithm				tions and	sufficient condition	ns for optimality
Learning Outcomes	<ul> <li>demons</li> <li>solve va</li> <li>understa</li> </ul>	n successful completion of the course, students should be able to: 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 algorithms for solving it.							
Pre-requisites	or MATH	H1805 (	H1101 or MA or MATH1813 2201, or alrea	3; and í	,		202)) or MA <sup>-</sup>	TH1111 or MATH1	211 or MATH180
Offer in 2012 - 2013	2nd sem	n						Examination	Мау
Offer in 2013 - 2014	Y								
Teaching Hours	36 hours	s of lec	ctures and stu	dent-centere	d learning				
Assessment Method	One 2.5-ł	5-hour w	written examir	nation (50%)	weighting) to	gether with c	oursework a	assessment (50% v	veighting)
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	sub		acies in applyir	ng the theorems			rrectly identify appropri problems with poor arg	
	Fail		emonstrates poor at being able to co			g by not being a	ble to identify	appropriate theorems o	r their applications, c
References	Instructor	or's lect	ture notes						
Course Website	http://bku	rumath	.hku.hk/course						

MATH2905 Queuein	g theory and simulation (6 credits)	Academic Year	2012						
Offering Department	Mathematics Quota								
Course Co-ordinator	Head of Dept, Mathematics								
Course Aim	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		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.							
Learning Outcomes	On successful completion of the course, students should be able to: - understand the terminology and nomenclature appropriate to queueing the - demonstrate knowledge and understanding of various queueing models; - formulate concrete problems using queueing theoretical approaches; - become familiar with fundamental principles of simulation and compare dif		chniques.						
Pre-requisites	Pass in (STAT1301 and (MATH1101 or MATH1102) and (MATH120 MATH1211 or MATH1804 or MATH1805 or MATH1813; and Pass in MATH2603, or already enrolled in this course.	1 or MATH1202))	or MATH1111 or						
Offer in 2012 - 2013	Not offered	Examination	To be confirmed						
Offer in 2013 - 2014	Y								
Teaching Hours	36 hours of lectures and student-centered learning								
Assessment Method	One 2.5-hour written examination (50% weighting) together with coursework	assessment (50%	weighting)						

Course Grade	A+ to F							
Grade Descriptors	A	Demonstrate an excellent understanding of key concepts and ideas by being able to identify appropriate theorems and their applications through correctly analysing problems, clearly and elegantly presenting correct logical reasoning and argumentation and being able to carry out computations carefully and correctly, and to solve problems with some innovative approaches.						
	В	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	Demonstrate some understanding of key concepts and ideas by being able to correctly identify appropriate theorems, but with substantial inadequacies in applying the theorems through incorrectly analysing problems with poor argument or presentation or with substantial computational errors.						
	Fail	Demonstrates poor and inadequate understanding by not being able to identify appropriate theorems or their applications, or not being able to complete the solution.						
Textbooks	To be de	ecided by the course instructor.						
References	S.M. Ro	R.B. Cooper: Introduction to Queueing Theory (Edward Arnold, 1981, 2nd ed.) S.M. Ross: Introduction to Probability Models (Academic Press, 1993, 5th ed.) S.M. Ross: A Course in Simulation (Macmillan, 1991)						
Course Website	http://hk	umath.hku.hk/course/MATH2905/						

MATH2906 Financia	i calculus	6 cred	ts)			Academic Year	2012			
Offering Department	Mathemati	Mathematics Quota								
Course Co-ordinator	Dr S P Yur	Dr S P Yung, Mathematics								
Course Aim				nt for the modeling of fi view. Stochastic calculu						
Course Contents	Asset prici Black-Scho	cing: risk holes moo	neutral relationship, no lel and its pricing parti	stocks, bonds, foreign o arbitrage principle. Bi al differential equation. cal binomial tree method	ownian mot Variations o	ion, stochastic calc	ulus, Ito's Lemma			
Learning Outcomes	<ul> <li>understa</li> <li>arbitrage-p</li> <li>demonstr</li> <li>describe</li> <li>implemer</li> </ul>	n successful completion of the course, students should be able to: understand the terminology and nature of bonds, interest rates, forwards, futures, stocks, options, and the nu bitrage-principle; demonstrate knowledge on using binomial tree models to find option prices via the risk-neutral concept; describe basic properties of a Brownian motion and the Black-Scholes stock price model; mplement stochastic calculus (such as Ito's Lemma) to derive Black-Scholes pricing partial differential equation o various type of options; and find a solution to this partial differential equation.								
Pre-requisites	MATH121	11 or MAT	01 and (MATH1101 H1804 or MATH1805 5, or already enrolled ir		MATH1201	or MATH1202)) (	or MATH1111 or			
Offer in 2012 - 2013	1st sem					Examination	No Exam			
Offer in 2013 - 2014	Y					1				
Teaching Hours	36 hours o	of lecture	s and student-centered	learning						
Assessment Method	100% from	m coursev	vork assessments							
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 monstrate 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		trates poor and inadequate gable to complete the solution	understanding by not being on.	able to identify	appropriate theorems of	r their applications, or			
Textbooks	To be deci	cided by tl	ne course instructor.							
References	M. Baxter 1996) P. Wilmott 1995)	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,								
Course Website	http://hkum	imath.hku.	hk/course/MATH2906/	1						

MATH2911 Game th	-				2012			
Offering Department	Mathemat	S		Quota				
Course Co-ordinator	Dr T W Ng	Mathematics						
Course Aim			uations of conflict and cooperation nematical game theory in an inte		oduce the studer			
Course Contents	mixed Na value; ap	Combinatorial games and Zermelo's Theorem; Prisonner's Dilemma; pure and mixed strategies, minimax theorem; mixed Nash equilibria; application to biology: evolutionary stable strategies; games in coalition form; Shapley value; application to politics: Shapley-Shubik power index; core and von Neumann-Morgenstern solution; bargaining set.						
Learning Outcomes	- understa - compute	On successful completion of the course, students should be able to: - understand the basic terminology and solution concepts in game theory; - compute explicitly different solution concepts for some simple cooperative and non-cooperative games; - apply game theoretical ideas and methods to solve some problems in economics and biology.						
Pre-requisites		Pass in (MATH1101 and MATH1102) or (MATH1201 and MATH1202) or MATH1211 or MATH1001 or MATH1111 or MATH1804 or MATH1805 or MATH1813						
Offer in 2012 - 2013	1st sem			Examination	No Exam			
Offer in 2013 - 2014	Y							
Teaching Hours	36 hours o	lectures and student-centered	d learning					
Assessment Method	Coursewo	k assessment (100% weighting	g)					
Course Grade	A+ to F							
Grade Descriptors	A	A Demonstrate an excellent understanding of key concepts and ideas of Game Theory by being able to identify the appropriate theorems and their applications through correctly analysing problems, clearly and elegantly presenting correct logical reasoning 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 of Game Theory 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 of Game Theory 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 monostrate some understanding of key concepts and ideas of Game Theory by being able to correctly identify appropriate theorems, but with substantial inadequacies in applying the theorems through incorrectly analysing problems with poor argument or presentation or with substantial computational errors.						
	Fail Demonstrates poor and inadequate understanding by not being able to identify appropriate theorems or their applications, or not being able to complete the solution.							
Textbooks	To be dec	led by the course instructor.						
References	Robert J.	umann, Lectures on Game Th	eory, Westview Press, 1989.					
Course Website	http://hkur	ath.hku.hk/course/MATH2911	/					

MATH2999 Directed	studies in	mathematics (6 credits)	Academic Year	2012				
Offering Department	Mathematic	S	Quota					
Course Co-ordinator	Dr T W Ng,	Mathematics						
Course Aim		e is designed for a student who would like to take an early experi with the opportunity to do independently a small mathematics p						
Course Contents	must achie	The subject matter of the project will be determined by consultation between the student and his supervisor. He must achieve good standing and get the approval from both the prospective supervisor and the course coordinator to take this course.						
Learning Outcomes	- study inde	On successful completion of the course, students should be able to: - study independently a topic that is not available in the regular curriculum; - understand how mathematical theories are applied and/or extended in problem-solving; - gain experience in project writing and oral presentation.						
Pre-requisites	Pass in MA Pass in MA	Pass in (MATH1101 and MATH1102 and MATH1201 and MATH1202) or (MATH1111 and MATH1211); and Pass in MATH2201, or already enrolled in this course; and Pass in MATH2301, or already enrolled in this course; and Pass in MATH2401, or already enrolled in this course.						
Offer in 2012 - 2013	1st sem 2	2nd sem	Examination	No Exam				
Offer in 2013 - 2014	Y							
Teaching Hours		lectures. The student is expected to do approximately 100 ho nd seminars.	urs of independent v	vork and to attend				
Assessment Method	By disserta	tion (70% weighting) and continuous assessment which may inc	ude oral presentation	n (30% weighting)				
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.							
	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							

В	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	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.

MATH3302 Algebra	II (6 credits	5)	Academic Year	2012				
Offering Department	Mathemati	ics	Quota					
Course Co-ordinator	Prof J T Y	Prof J T Yu, Mathematics						
Course Aim	the two co	e is an extension of Algebra I and goes deeper into the vapurses are complete in themselves, and may be followed lathematics.						
Course Contents	- Polynomi - Fundame	<ul> <li>Presentation of groups: generators and relations, free groups</li> <li>Polynomial rings in several variables</li> <li>Fundamental theorem on symmetric polynomials</li> <li>Fields extensions, elements of Galois theory (characteristic zero)</li> </ul>						
Learning Outcomes	- understar - understar	On successful completion of the course, students should be able to: - understand and compute splitting fields of irreducible polynomials; - understand and compute typical extensions of fields; - compute the automorphisms and Galois groups of field extensions.						
Pre-requisites	Pass in M	ATH2301						
Offer in 2012 - 2013	2nd sem		Examination	Мау				
Offer in 2013 - 2014	Y	Y						
Teaching Hours	36 hours o	f lectures and student-centered learning						
Assessment Method	One 2.5-h	our written examination (50% weighting) together with course	sework assessment (50% v	veighting)				
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.						
	Demonstrate some understanding of key concepts and ideas by being able to correctly identify appropriate theorems, but with substantial inadequacies in applying the theorems through incorrectly analysing problems with poor argument or presentation or with substantial computational errors.							
	Fail Demonstrates poor and inadequate understanding by not being able to identify appropriate theorems or their applications, or not being able to complete the solution.							
Textbooks	To be deci	ided by the course instructor.						
References	I.N. Herste N. Jacobso S. Lang: U	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://hkum	nath.hku.hk/course/MATH3302/						

MATH3404 Function	MATH3404 Functional analysis (6 credits)							
Offering Department	Mathematics	Quota						
Course Co-ordinator	Dr C W Wong, Mathematics							
Course Aim	This course introduces students to the basic knowledge of linear functional analysis, an important branch of modern analysis.							
Course Contents	<ul> <li>Metric spaces: Open and closed sets. Convergent sequences. Completeness</li> <li>Normed spaces, Banach spaces: Finite dimensional normed spaces and subspaces. Compactness and finite dimension. Bounded linear operators. Normed spaces of operators, dual space</li> <li>Inner product spaces, Hilbert spaces: Orthogonal complements, direct sums. Orthonormal sets and sequences, series related to orthonormal sets and sequences. Total orthonormal sets and sequences. Special polynomials. Riesz's representation theorem. Adjoint operator, self-adjoint, normal and unitary operators</li> </ul>							

	theorem,	<ul> <li>Fundamental theorems for normed and Banach spaces: Hahn-Banach theorem. Reflexive spaces. Category theorem, uniform boundedness principle. Open mapping theorem. Closed graph theorem</li> <li>Spectral theory of linear operators</li> </ul>						
Learning Outcomes	<ul> <li>compare and (iii) n how vector</li> <li>understa spaces;</li> <li>discuss</li> </ul>	ssful completion of the course, students should be able to: and contrast (i) finite and infinite dimensional linear spaces, ( ormed and inner product spaces; in particular, recognize the i rs are represented in these spaces; and the notions of Banach spaces and Hilbert Spaces. State a he dual spaces of some standard Banach spaces; he boundedness of linear operators and the spectra of special l actional analysis in the study of differential equations and optimi	mportance of complet nd apply fundamental inear operators;	eness and discuss				
Pre-requisites		MATH1101 and MATH1102 and MATH1201 and MATH120 1 and MATH2201 and MATH2401)	2 and MATH2401) o	r (MATH1111 and				
Offer in 2012 - 2013	2nd sem		Examination	Мау				
Offer in 2013 - 2014	Y							
Teaching Hours	36 hours of	of lectures and student-centered learning						
Assessment Method	One 2.5-h	our written examination (50% weighting) together with coursew	ork assessment (50%	weighting)				
Course Grade	A+ to F							
Grade Descriptors	A	A Demonstrate an excellent understanding of key concepts and ideas by being able to identify the appropriate theorems and their applications through correctly analysing problems, clearly and elegantly presenting correct logical reasoning and argumentation and being able to carry out computations carefully and correctly, and with some innovative approaches to solving problems.						
	В	Demonstrate a good understanding of key concepts and ideas by being able to identify the appropriate theorems and their applications through correctly analysing problems, but with some minor inadequacies in arguments, identifying the appropriate theorems or their applications and presentation or with some minor computational errors.						
	С	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 Demonstrates poor and inadequate understanding by not being able to identify appropriate theorems or their applications, or not being able to complete the solution.							
Textbooks	To be dec	ided by the course instructor.						
References	Erwin Kre	yszig: Introductory Functional Analysis with Applications (John-	Niley and Sons, 1978)					
Course Website	http://hkur	nath.hku.hk/course/MATH3404/						

MATH3406 Introduc	tion to pa	artial di	ifferential equ	uations (6 d	credits)		Academic Year	2012
Offering Department	Mathema	natics					Quota	
Course Co-ordinator	Dr S P Yu	Yung, Ma	athematics					
Course Aim	This cour underlyin			s to the basic	c techniques fo	or solving partial	differential equation	ons as well as the
Course Contents	eigenvalu character existence	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.						
Learning Outcomes	- apply th - understa	On successful completion of the course, students should be able to: - apply the tools of calculus, linear algebra, mathematical analysis in a coherent way to PDE problems; - understand the basic theory of partial differential equations and the methods to solve them; - apply the knowledge of partial differential equations to physical sciences and engineering.						
Pre-requisites	Pass in MATH1111 and MATH1211 and MATH2201 and MATH2401; and Pass in MATH2405, or already enrolled in this course.							
Offer in 2012 - 2013	1st sem	ı					Examination	No Exam
Offer in 2013 - 2014	Y							
Teaching Hours	36 hours	rs of lectu	res and student	-centered lea	rning			
Assessment Method	100% fro	rom cours	sework assessm	ents				
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.						
	B Demonstrate a good understanding of key concepts and ideas by being able to identify the appropriate theorems and their applications through correctly analysing problems, but with some minor inadequacies in arguments, identifying the appropriate theorems or their applications and presentation or with some minor computational errors.							
	C Demonstrate an acceptable understanding of key concepts and ideas by being able to correctly identify appropriate theorems, but with some inadequacies in applying the theorems through incorrectly analysing problems with poor argument and presentation or a number of minor computational errors.							

	D	Demonstrate some understanding of key concepts and ideas by being able to correctly identify appropriate theorems, but with substantial inadequacies in applying the theorems through incorrectly analysing problems with poor argument or presentation or with substantial computational errors.				
	Fail	Demonstrates poor and inadequate understanding by not being able to identify appropriate theorems or their applications, or not being able to complete the solution.				
Textbooks	To be decid	led by the course instructor.				
References	- D. Bleeck	- W.A. Strauss: Partial Differential Equations: An Introduction, 2nd ed. (Wiley) - D. Bleecker & G. Scordas: Basic Partial Differential Equations (International Press) - L.C. Evans: Partial Differential Equations (American Mathematical Society)				
Course Website	http://hkumath.hku.hk/course/MATH3406/					

MATH3501 Geometry	y (6 credits	s)	Academic Year	2012					
Offering Department	Mathemati	cs	Quota						
Course Co-ordinator	Dr P P W \	Wong, Mathematics							
Course Aim	which we l thinking. In surfaces 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 excellent training in intuitive thinking. In this course we study the differential geometry of curves and surfaces in 3-space. In the study of regular surfaces in 3-space we exhibit geometric notions that are definable in terms of metrical properties of these surfaces alone, leading to the intrinsic geometry of surfaces.							
Course Contents		space curves, regular surfaces in three-dimensional Euclic atures, Gauss's Theorema Egregium, Gauss-Bonnet Theorem		ap, Gaussian and					
Learning Outcomes	<ul> <li>understar</li> <li>be able to</li> </ul>	On successful completion of the course, students should be able to: understand the fundamental theorems on curves; be able to compute the Gaussian and mean curvatures; understand the basics of intrinsic geometry of surfaces.							
Pre-requisites		MATH1101 and MATH1102 and MATH1201 and MATH1 1 and MATH2201 and MATH2401)	202 and MATH2401) or	(MATH1111 and					
Offer in 2012 - 2013	1st sem		Examination	Dec					
Offer in 2013 - 2014	Y								
Teaching Hours	36 hours o	f lectures and student-centered learning							
Assessment Method	One 2.5-ho	our written examination (50% weighting) together with course	ework assessment (50% w	eighting)					
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	D Demonstrate some understanding of key concepts and ideas by being able to correctly identify appropriate theorems, but with substantial inadequacies in applying the theorems through incorrectly analysing problems with poor argument or presentation or with substantial computational errors.							
	Fail Demonstrates poor and inadequate understanding by not being able to identify appropriate theorems or their applications, or not being able to complete the solution.								
Textbooks	To be deci	ded by the course instructor.							
References	M P Do Ca	armo: Differential Geometry of Curves and Surfaces (Prentic	e-Hall, 1976)						

MATH3511 Introduc	MATH3511 Introduction to differentiable manifolds (6 credits)							
Offering Department	Mathematics	Quota						
Course Co-ordinator	Dr P P W Wong, Mathematics							
Course Aim	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. Especially, it introduces Lie groups through the use of matrix groups.							
Course Contents	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. Matrix groups as Lie groups. Covariant differentiation: affine connections.							
Learning Outcomes	On successful completion of the course, students should be able to: - understand the basic language and concepts of modern differential geometry with examples; - apply the knowledge of algebra and analysis learned previously to solve geometric problems;							

	- understand the role of differential geometry in other branches of mathematics and theoretical physics.							
Pre-requisites	Pass in (MATH2301 or MATH2303) and MATH2401 and MATH3501; and Pass in MATH2402, or already enrolled in this course.							
Offer in 2012 - 2013	2nd sem	2nd sem Examination May						
Offer in 2013 - 2014	Y							
Teaching Hours	36 hours o	lectures and student-centered learning						
Assessment Method	One 2.5-h	our written examination (50% weighting) together	r with coursework as	sessment (50% v	veighting)			
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.						
	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 wi substantial inadequacies in applying the theorems through incorrectly analysing problems with poor argument or presentation or with substantial computational errors.							
	Fail Demonstrates poor and inadequate understanding by not being able to identify appropriate theorems or their applications, or not being able to complete the solution.							
Textbooks	To be dec	ded by the course instructor.						
References	Dennis Barden and Charles B. Thomas: An Introduction to Differential Manifolds, (Imperial College Press, 2003) W. Boothby: An introduction to differential manifolds and Riemannian Geometry, 2nd Ed., (Academic Press, 2002) John M. Lee: Introduction to smooth manifolds, (Springer, 2002)							
Course Website	http://hkun	ath.hku.hk/course/MATH3511/						

MATH3602 Scientific	02 Scientific computing (6 credits)						Academic Year	2012	
Offering Department	Mathemat	Mathematics					Quota		
Course Co-ordinator	Head of D	Head of Dept, Mathematics							
Course Aim						ational technique c or industrial ap		ous kinds of matri	
Course Contents	series, ite and some	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.							
Learning Outcomes	<ul> <li>apply dir</li> <li>analyze</li> <li>give a pr</li> <li>apply ite</li> </ul>	On successful completion of the course, students should be able to: - apply direct method in solving a linear system; - analyze the complexity of a numerical algorithm; - give a proof for Schur's Theorem and Gershgorin's Theorem; - apply iterative methods in solving a linear system; - compute the singular values of a matrix.							
Pre-requisites				FH1102 and M ly enrolled in th		ATH1202) or (M	ATH1111 and MA <sup>-</sup>	ΓH1211); and	
Offer in 2012 - 2013	Not offere	red					Examination	To be confirme	
Offer in 2013 - 2014	Y								
Teaching Hours	36 hours of	s of lect	tures and stud	ent-centered le	arning				
Assessment Method	One 2.5-h	-hour w	vritten examina	ation (50% weig	hting) together	with coursework	assessment (50%	weighting)	
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 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.								
	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.								
	C Demonstrate an acceptable understanding of key concepts and ideas by being able to correctly identify appropriate theorems and numerical algorithms, 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 numerical algorithms, but with substantial inadequacies in applying them through incorrectly analysing problems with poor argument or presentation or with substantial computational errors.								
	Fail				lerstanding by not b complete the solut		appropriate theorems a	nd numerical algorithm	
Textbooks	To be dec	ecided b	by the course	instructor.					
References	MichaelT	Tileet	To be decided by the course instructor. 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://hkumath.hku.hk/course/MATH3602/

MATH3902 Operatio	ns resear	rch II	II (6 credite	S)				Academic Year	2012	
Offering Department	Mathemat	Mathematics Quota								
Course Co-ordinator	Head of D	Head of Dept, Mathematics								
Course Aim	dynamic p aspects o	progr of algo model	ramming (D porithms as v	P) and Mark vell as applic	ov decision pr ations. The co	ocesses (MDP urse serves, to	) in operation	ons research. The courses on linea	r programming (IP ere is emphasis o ir programming an tudies in operation	
Course Contents			amming and verage costs		ynamic progra	mming (detern	ninistic/stoc	hastic) and Marko	ov decision proces	
Learning Outcomes	<ul> <li>understa</li> <li>Markov de</li> <li>explain</li> <li>process;</li> </ul>	stand t decision the t	the terminol ion process; typical tech	ogy and nor niques empl	nenclature appointed over the overlapped in integer	·	eger progra g, dynamic	programming an	; programming an d Markov decisio	
Pre-requisites	(MATH11	102 ai	and MATH12	201) or (MAT		TH1202) or (N		r (MATH1101 ar and MATH1211);	nd MATH1202) o and	
Offer in 2012 - 2013	Not offere	red					1	Examination	To be confirmed	
Offer in 2013 - 2014	Y									
Teaching Hours	36 hours of	s of lea	ctures and s	tudent-cente	ered learning					
Assessment Method	One 2.5-h	-hour v	written exan	nination (50%	% weighting) to	gether with co	ursework as	ssessment (50%)	weighting)	
Course Grade	A+ to F									
Grade Descriptors	A	the	neorems, algori	thms and their and argument	applications thro ation and being a	ugh correctly anal	lysing problem	ns, clearly and elega	principles, appropriate ntly presenting correct and to solve problems	
	B Demonstrate a good understanding of key concepts and ideas by being able to identify basic principles, appropriate theorems, algorithms and their applications through correctly analysing problems, but with some minor inadequacies in arguments, identifying the appropriate theorems or their applications and presentation or with some minor computational errors.									
	С	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.								
	D	alg	Igorithms and t	their applicatior	ns but with substa		s in applying	the theorems through	appropriate theorems h incorrectly analysing	
	Fail					ng by not being complete or com			appropriate theorems,	
Textbooks	To be dec	ecided	d by the cou	rse instructor	-					
References	P. Thie: N	Marko	ov Decision	Processes (	COMAP, Inc. 1	983)	0	nic Press, 1977) ley, 1988)		
		G.L. Nemhauser and L.A. Wolsey: Integer and Combinatorial Optimization (Wiley, 1988) http://hkumath.hku.hk/course/MATH3902/								

MATH3903 Network	models in operations research (6 credits)	Academic Year	2012			
Offering Department	Mathematics	Quota				
Course Co-ordinator	Prof S C K Chu, Mathematics					
Course Aim	The objective is to provide a fundamental account of the basic results operations research. There is an equal emphasis on all three aspec applications. The course serves, together with a course on linear program background for more advanced studies in operations research.	s of understanding	, algorithms and			
Course Contents	Graphs and algorithms. Trees, matchings and paths. Network models of tra Ford-Fulkerson network flow theory and computation for maximum flow Applications to combinatorial optimization problems such as allocation, loca if time permits.	and minimum cost	flow algorithms.			
Learning Outcomes	On successful completion of the course, students should be able to: - understand the fundamental concept and approach of graphs and networks study of operations research; - demonstrate knowledge and understanding of the underlying technique algorithms and their extensions; - understand the theory of network flows and the duality aspects in such me	es of the various gr	aph and network			
Pre-requisites	Pass in (MATH1101 and MATH1102) or (MATH1101 and MATH1201) (MATH1102 and MATH1201) or (MATH1102 and MATH1202) or (MATH1112					

	Pass in N	ATH2901, or already er	nrolled in this course.					
Offer in 2012 - 2013	2nd sem			Examination	May			
Offer in 2013 - 2014	Y							
Teaching Hours	36 hours	of lectures and student-	centered learning					
Assessment Method	One 2.5-	our written examination	(50% weighting) together with course	work assessment (50% v	veighting)			
Course Grade	A+ to F							
Grade Descriptors	A Demonstrate an excellent understanding of key concepts and ideas by being able to identify basic principles theorems, algorithms and their applications through correctly analysing problems, clearly and elegantly prese logical reasoning and argumentation and being able to carry out computations carefully and correctly, and to so with some innovative approaches.							
	в	B Demonstrate a good understanding of key concepts and ideas by being able to identify basic principles, appropriate theorems, algorithms and their applications through correctly analysing problems, but with some minor inadequacies in arguments, identifying the appropriate theorems or their applications and presentation or with some minor computational errors.						
	С	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.						
	D	Demonstrate some understanding of key concepts and ideas by being able to identify basic principles, appropriate theore algorithms and their applications but with substantial inadequacies in applying the theorems through incorrectly analys problems with poor argument or presentation or with substantial computational errors.						
	Fail	Fail Demonstrates 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.						
Textbooks	To be de	ided by the course instr	uctor.					
References	R.K. Ahu	A.S. Bazaraa, J.J. Jarvis and H.D.Sherali: Linear Programming and Network Flows. (2/e 1990) R.K. Ahuja, T.L. Magnanti and J.L. Orlin: Network Flows: Theory Algorithms, and Applications. (1993) I.A. Taha: Operations Research: an Introduction. (7/e 2003)						
Course Website	http://hku	nath.hku.hk/course/MA	TH3903/					

MATH3907 Numeric		Jus 10			caicu	ius (	00	eul	13)							nic Year		2012	
Offering Department	Mathema	Mathematics Quota																	
Course Co-ordinator	Head of [	Head of Dept, Mathematics This course aims at providing effective numerical methods as well as their theoretical aspects for solving problems																	
Course Aim	This cour arisen fro	urse a rom fi	aims at financia	t providin I derivati	ng effe ives ar	ctive nd as	num set p	nerica pricin	al m าg.	etho	ds as	s well	as thei	r the	oretica	l aspects	for	solvir	ng problem
Course Contents	differentia	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.																	
Learning Outcomes	derivative	nstrate ves; nent a in the differe	ate know and and e conne rential e	Idedge ar alyse var ction bet quation;	nd unc rious r tween	dersta numei i the b	andir rical binor	ng of meth mial t	f the hods tree	mart s on t met	tingal the Bl hod a	le the lack-S and th	ory in c Scholes e finite	s pric diffe	ing dif	erential method	equ	ation;	ted financia ack-Schole
Pre-requisites	Pass in ( or MATH Pass in N Pass in N	H180	05 or M/ TH2603	ATH1813 , or alrea	3; and ady en	l nrolled	, d in t	this c	cours	se; ar		TH120	)2)) or	MAT	H1111	or MAT	H12	11 or!	MATH180
Offer in 2012 - 2013	Not offere	ered												E	xamir	nation		To be	confirmed
Offer in 2013 - 2014	Y																		
Teaching Hours	36 hours	rs of le	lectures	and stu	ident-c	center	red l	earni	ing										
Assessment Method	One 2.5-	5-hour	ur writtei	n examir	nation	(50%	5 wei	ightir	ng) t	ogeth	ner w	ith co	ursewo	ork as	sessn	nent (50%	6 w	eightir	g)
Course Grade	A+ to F																		
Grade Descriptors	A	ti	their app	blications t tation and	through	o corre	ectly a	analys	sing	proble	ms, c	learly	and ele	gantly	presen	ting correct	tlo	gical re	theorems and easoning and pproaches to
	В	a	applicatio		h correc	ctly ana	alysin	ng prol	blem	s, but	with so	ome m	nor inad	equad	ies in á				ems and thei ne appropriate
	С	C Demonstrate an acceptable understanding of key concepts and ideas by being able to correctly identify appropriate theorem: but with some inadequacies in applying the theorems through incorrectly analysing problems with poor argument and presentation or a number of minor computational errors.																	
	D	s	substanti	trate some ial inadequ ubstantial c	uacies ir	n apply	ying tl	he the	oncep eoren	ots and ns thro	d ideas ough in	s by be ncorrec	ng able Ily analy	to cor sing p	rectly id roblems	entify approved with poor	opria argu	te theor ment o	rems, but with r presentation
	Fail			trates poor g able to co					tandi	ng by	not be	eing ab	e to ide	ntify a	ppropria	te theorem	is or	their a	pplications, o
Textbooks	To be de	lecide	led by th	e course	e instru	uctor.													
References	J. Strikwe Baxter ar														39)				

	Wilmott, Howison and Dewynne: The mathematics of Financial Derivatives (Cambridge University Press, 1995) Fleming and Rishel: Deterministic and Stochastic Optimal Control (Springer, 1975)
Course Website	http://hkumath.hku.hk/course/MATH3907/

MATH3988 Mathema	atics intern	ship (6 credits)		Academic Year	2012					
Offering Department	Mathemati	Mathematics Quota								
Course Co-ordinator	Dr T W Ng	Dr T W Ng, Mathematics								
Course Aim	study. The gained in t	e aims to offer students the opportunitie workplace learning experience would ne study to the real work environments n the University or outside the Universi	d be of great benefits to the Students have to take on	e students to appl at least 160 hours	y their knowledge					
Course Contents	various tas	university: each student will be supe ks as instructed by the supervisor. e university: each student will carry opervisor.			0 1 2					
Learning Outcomes	- have gair	sful completion of the course, students ed work experience in an industry relat nderstanding of how mathematics is us	ted to mathematical science							
Pre-requisites	Students a	re expected to have satisfactorily comp	leted their Year 2 study.							
Offer in 2012 - 2013	1st sem	2nd sem Summer		Examination	No Exam					
Offer in 2013 - 2014	Y									
Teaching Hours	No formal 20 working	eaching, but it is expected that studen days.	ts are to work at least 160 h	nours (lunch hour e	cluded) in at leas					
Assessment Method	presentation during the	oletion of the internship, each stude n on their internship experience. Sup nternship period (in the case of interns sed on the feedback by the external su	pervisors will assess the s ships outside the university,	tudents based on	their performance					
Course Grade	Pass/Fail									
Grade Descriptors	Pass	Demonstrate ability of applying knowledge to required in the job or assigned by supervisi colleagues, and clients in the job. Successfu hours, written and oral report, and evaluation b	or(s). Establish effective collabor Ily fulfill the requirements set out	ation and communication	on with supervisor(s),					
	Fail	Demonstrate very limited or no ability of apply work required in the job or assigned by supern (s), other colleagues, or clients in the job. Fail hours, written and oral report, or evaluation by	visor(s). Fail to establish effective to satisfy the requirements set out	collaboration or commur	nication with supervisor					
Remarks	who have Satisfactor internship Students w Visit http:// Enrolment	re expected to have satisfactorily comp completed Year 1. / completion of this course can be co will be recorded on the student's tra ho are interested to enrol in this course vww.hku.hk/science/current/bsc/interns of this course is not conducted via the partment/School office after approval b	unted towards the Experier inscript. This course will t e should contact the Depart ship/ for more information. online course selection sys	ntial Learning requi be assessed on Pa ment to obtain the a stem and should be	rement. Details o ass or Fail basis. approval. made through the					

MATH3999 Mathema	atics project (12 credits)	Academic Year	2012
Offering Department	Mathematics	Quota	
Course Co-ordinator	Dr T W Ng, Mathematics		
Course Aim	The aim of the course is to provide students with opportunity to formulate practical interest and/or have a foretaste of mathematical research. The we considered a highly desirable part of the training of a mathematician.		
Course Contents	The subject matter of the project will be determined by consultation betwee The projects will be selected from areas of pure and applied mathematics and get the approval from both the prospective supervisor and the course of	. Students must achi	eve good standing
Learning Outcomes	On successful completion of the course, students should be able to: - study independently and in depth an advanced topic that is not available i - analyze and synthesize information gathered from different sources; - articulate their findings and conclusions; - give an exposition of their work in a written report.	n the regular curriculu	ım;
Pre-requisites	Pass in (MATH1101 and MATH1102 and MATH1201 and MATH1202 (MATH1111 and MATH1211 and MATH2201 and MATH2301 and MATH24		d MATH2401) or
Offer in 2012 - 2013	Year long	Examination	No Exam
Offer in 2013 - 2014	Y		
Teaching Hours	No regular lectures. The student is expected to do approximately 200 ho meetings and seminars.	urs of independent v	vork and to attend
Assessment Method	By dissertation (70% weighting) and continuous assessment which may inc	lude oral presentation	n (30% weighting)
	288		

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	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.

MATH6501 Topics in	n algebra	a (6 cr	redits)				Academic Year	2012
Offering Department	Mathema	Mathematics Quota						
Course Co-ordinator	Prof J T \	Yu, M	<b>Nathematics</b>					
Course Aim			udents special bra in greater		matics with the	opportunity to study	some	
Course Contents	Galois the represent	heory, ntation	, quadratic for n, introduction	ms, multilinear	algebra, algebre e algebra, Grol	heory, rings and mo raic number theory, oner basis theory, ry from year to year.	group	
Learning Outcomes	- acquire	e know	wledge in the a	covered topics	tudents should to considerable studies in area	e depth;		
Pre-requisites	MATH12	211 an	TH1101 and nd MATH2301 H3302, or alrea	); and		and MATH1202 a	nd MATH2301) or	(MATH1111 and
Offer in 2012 - 2013	2nd sem	n					Examination	Мау
Offer in 2013 - 2014	Y							
Teaching Hours	36 hours	s of lec	ectures and stu	ident-centered	learning			
Assessment Method	One 2.5-ł	5-hour v	written exami	nation (50% w	eighting) togeth	er with coursework	assessment (50% v	veighting)
Course Grade	A+ to F							
Grade Descriptors	A	the	neir applications	through correctly	analysing probler	pts and ideas by being ns, clearly and elegant ons carefully and correc	ly presenting correct lo	ogical reasoning and
	в	ар	pplications throug	h correctly analys	ing problems, but v	nd ideas by being able vith some minor inadequ some minor computation	acies in arguments, ider	
	С	bu	ut with some ina	adequacies in ap		epts and ideas by being ns through incorrectly a		
	D	Demonstrate some understanding of key concepts and ideas by being able to correctly identify appropriate theorems, but with substantial inadequacies in applying the theorems through incorrectly analysing problems with poor argument or presentation or with substantial computational errors.						
	Fail		Demonstrates poo ot being able to c			not being able to identify	appropriate theorems of	r their applications, or
Textbooks	To be de	ecided	d by the cours	e instructor.				
Course Website	http://hku	umath	h.hku.hk/cours	e/MATH6501/				

MATH6502 Topics in	MATH6502 Topics in applied discrete mathematics (6 credits)						
Offering Department	Mathematics Quota						
Course Co-ordinator	Prof S C K Chu, Mathematics						
Course Aim	To provide students with the opportunity to study some further topics in applied discrete mathematics.						
Course Contents	A selection of advanced topics in discrete mathematics, which may include a discrete optimization, extremal combinatorics, and algebraic and probabilis The selection may vary from year to year.						
Learning Outcomes	On successful completion of the course, students should be able to: - demonstrate knowledge and understanding of some research areas of appli	ed discrete mathem	atics;				

	- solve v	- solve various discrete mathematics problems using some advanced techniques.								
Pre-requisites		Pass in MATH2600; and Pass in MATH2301, or already enrolled in this course.								
Offer in 2012 - 2013	2nd sem	2nd sem Examination May								
Offer in 2013 - 2014	Y									
Teaching Hours	36 hours	rs of lect	tures and stude	ent-centered lea	arning					
Assessment Method	One 2.5	5-hour w	vritten examina	ation (50% weigh	hting) together	with coursework	assessment (50%	weighting)		
Course Grade	A+ to F									
Grade Descriptors	А	Demonstrate an excellent understanding of key concepts and ideas by being able to identify the appropriate theorems and their applications through correctly analysing problems, clearly and elegantly presenting correct logical reasoning and argumentation and being able to carry out computations carefully and correctly, and with some innovative approaches to solving problems.								
	в	B Demonstrate a good understanding of key concepts and ideas by being able to identify the appropriate theorems and their applications through correctly analysing problems, but with some minor inadequacies in arguments, identifying the appropriate theorems or their applications and presentation or with some minor computational errors.								
	С	C Demonstrate an acceptable understanding of key concepts and ideas by being able to correctly identify appropriate theorems, but with some inadequacies in applying the theorems through incorrectly analysing problems with poor argument and presentation or a number of minor computational errors.								
	D	Demonstrate some understanding of key concepts and ideas by being able to correctly identify appropriate theorems, but with substantial inadequacies in applying the theorems through incorrectly analysing problems with poor argument or presentation or with substantial computational errors.								
	Fail	Fail Demonstrates poor and inadequate understanding by not being able to identify appropriate theorems or their applications, or not being able to complete the solution.								
Textbooks	To be de	decided I	by the course i	instructor.						
References	Instructo	tor's lect	ture notes.							
Course Website	http://hk	kumath.l	hku.hk/course/	/MATH6502/						

credits)	n matnema	tical programming and optimization (6	Academic Year	2012			
Offering Department	Mathemati	cs	Quota				
Course Co-ordinator	Head of D	ept, Mathematics					
Course Aim		greater depth of some special topics in mathematical program is in Operations Research or related subject areas.	ming or optimization. I	t is mainly intended			
Course Contents		n of advanced topics, which may include convex, quadratic, g orogramming and goal programming; or discrete and combinate to year.					
Learning Outcomes	<ul> <li>understa</li> <li>approache</li> <li>demonst</li> </ul>	On successful completion of the course, students should be able to: understand the advanced concept and approach of the mathematical programming topic(s) and/or optimization pproaches as appropriate in Operations Research; demonstrate knowledge and understanding of the underlying theory and techniques of the various formulations nd algorithms plus their extensions.					
Pre-requisites	(Pass in M	TH2901 and MATH2904); and ATH3902, or already enrolled in this course); and ATH3903, or already enrolled in this course).					
Offer in 2012 - 2013	Not offered	t	Examination	To be confirmed			
Offer in 2013 - 2014	Y						
Teaching Hours	36 hours o	f lectures and student-centered learning					
Assessment Method	One 2.5-h	our written examination (50% weighting) together with coursew	ork assessment (50%	weighting)			
Course Grade	A+ to F						
Grade Descriptors	A Demonstrate an excellent understanding of key concepts and ideas by being able to identify appropriate theorems and their applications through correctly analysing problems, clearly and elegantly presenting correct logical reasoning and argumentation and being able to carry out computations carefully and correctly, and to solve problems with some innovative approaches.						
	B Demonstrate a good understanding of key concepts and ideas by being able to identify appropriate theorems and their applications through correctly analysing problems, but with some minor inadequacies in arguments, identifying the appropriate theorems or their applications and presentation or with some minor computational errors.						
	C Demonstrate an acceptable understanding of key concepts and ideas by being able to correctly identify appro but with some inadequacies in applying the theorems through incorrectly analysing problems with poor 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 Demonstrates poor and inadequate understanding by not being able to identify appropriate theorems or their applications, or not being able to complete the solution.					
Textbooks	To be deci	ded by the course instructor.					
References	S.P. Bradl N. Christof	raa and C.M. Shetty, Nonlinear Programming, 2nd edition (Joh ey, A.C. Hax and T. Magnanti, Applied Mathematical Programn ides et al (ed.): Combinatorial Optimization (John Wiley & Sons Optimization Theory and Applications (Wiley Eastern Ltd., 1978	ning (Áddison-Wesley, s, 1979)				
	1	390					

	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/MATH6503/

MATH6504 Geometr	ic topolo	ogy (6	credits)			Academic Year	2012	
Offering Department	Mathema	natics			Quota			
Course Co-ordinator	Head of	of Dept,	Mathematics					
Course Aim			gives a geometric introd be on the geometric mot				gy. The emphasis	
Course Contents			mpactness. Connectedne plications of simplicial ho					
Learning Outcomes	<ul> <li>underst many ap</li> </ul>	n successful completion of the course, students should be able to: understand basic ideas and constructions which are important both in pursuing the deeper theories as well as in any applications in algebraic topology; understand the ideas of attaching space, complexes, lifting and extension properties, and surgery on manifolds.						
Pre-requisites			H1101 and MATH1102 Nd MATH1211 and MATH				nd MATH2401) or	
Offer in 2012 - 2013	Not offer	ered				Examination	To be confirmed	
Offer in 2013 - 2014	Y							
Teaching Hours	36 hours	rs of lec	tures and student-center	ed learning				
Assessment Method	One 2.5-	5-hour v	written examination (50%	weighting) together with	coursework	assessment (50%	weighting)	
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 theorem: 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		emonstrates poor and inadequa t being able to complete the sol		g able to identify	y appropriate theorems	or their applications, or	
Textbooks	To be de	decided	by the course instructor.					
References			g, Basic Topology (Spring Introduction to Algebraic		lag GTM)			
Course Website	http://hku	kumath.	.hku.hk/course/MATH650	4/				

MATH6505 Real ana	lysis (6 credits)	Academic Year	2012				
Offering Department	Mathematics	Quota					
Course Co-ordinator	Prof W S Cheung, Mathematics						
Course Aim	The aim of the course is to introduce the basic ideas and technique	es of measure theory and the	Lebesgue integra				
Course Contents	<ul> <li>Lebesgue Measure on R: Measurable sets and Lebesgue measu</li> <li>The Lebesgue Integral: The Lebesgue integral, modes of converg</li> <li>Differentiation and Integration: Functions of bounded variation, Di</li> <li>General Measure and Integration Theory: Measurable spaces, theorems, the Radon-Nikodym theorem</li> <li>The L^p Spaces: The L^p spaces, convergence and completence</li> </ul>	gence fferentiation of an integral, ab measurable functions, integra	ation, convergenc				
Learning Outcomes	On successful completion of the course, students should be able to: - describe basic properties of Lebesgue measure and measurable functions; - construct the Lebesgue integral, elucidate its basic properties and appreciate the existence of other useful integration theories besides Riemann's; - understand the basic features of L^p spaces.						
Pre-requisites	Pass in MATH2401						
Offer in 2012 - 2013	2nd sem	Examination	Мау				
Offer in 2013 - 2014	Y						
Teaching Hours	36 hours of lectures and student-centred learning						
Assessment Method	One 2.5-hour written examination together with coursework asses course, the final examination and coursework assessment would e						
Course Grade	A+ to F						

Grade Descriptors	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	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	Demonstrate an acceptable understanding of key concepts and ideas by being able to correctly identify appropriate theorems, but with some inadequacies in applying the theorems through incorrectly analysing problems with acceptable argument and presentation.	
	D	Demonstrate some understanding of key concepts and ideas by being able to correctly identify appropriate theorems, but with substantial inadequacies in applying the theorems through incorrectly analysing problems with poor argument or presentation.	
	Fail	Demonstrates poor and inadequate understanding by not being able to identify appropriate theorems or their applications, or not being able to complete the solution.	
Textbooks	To be de	ecided by the course instructor.	
References	H.L. Royden: Real Analysis, Collier MacMillan W. Rudin: Real and Complex Analysis, McGraw Hill		
Course Website	http://hk	umath.hku.hk/course/MATH6505/	

PHYS0003 Nature of	the Unive	verse (	6 credits)	the Universe (6 credits)				
Offering Department	Physics						Quota	
Course Co-ordinator	Dr K M Le	Dr K M Lee, Physics						
Course Aim					ed for students ics is required, b		nd all years. No p	rior knowledge i
Course Contents	our solar provides s	Topics covered include the observational aspect of astronomy (including constellations and planets), the physics o our solar system, and our own Sun, stars and their evolution, galaxies, blackholes, and cosmology. It also provides students with a basic understanding of the relationship of astronomy to life and how our nature works or the macroscopic level. Students are expected to participate actively in the night sky observations.						
Learning Outcomes	<ul> <li>identify a explain the</li> <li>use the c</li> <li>review th</li> <li>the expansion</li> <li>apply que</li> <li>gravitation</li> <li>explain the</li> </ul>	On successful completion of the course, students should be able to: identify and describe the major objects in our Solar System and our universe (including stars and galaxies), and explain their main properties use the celestial sphere model to describe the apparent trajectories of celestial objects review the evolution of the world-view from the geocentric model to the heliocentric model and the discovery of he expansion of the universe on our world-view apply quantitative physical laws, including Kepler's three laws of planetary motion, Newton's law of universal gravitation, Doppler shift formula and Hubble's law to calculate and solve simple astronomical problems explain the evolution of stars and the evolution of the universe review communicate astronomical problems and solutions using appropriate astronomical terminology and good English						
Pre-requisites	Nil (Not for	for stude	ents who have	e already pas	sed in PHYS00	01 or PHYS0002 be	efore.)	
Offer in 2012 - 2013	1st sem	2nd se	em				Examination	Dec May
Offer in 2013 - 2014	Y							
Teaching Hours	48 hours o	of lectu	ures and tutori	als; 12 hours	s of laboratory w	ork		
Assessment Method			ritten examina gnments (50%		weighting), and	continuous asse	ssment including p	presentation and
Course Grade	A+ to F							
Grade Descriptors	A Demonstrate thorough mastery at an advanced level of exten learning outcomes. Show strong analytical and critical abilities a to apply knowledge to a wide range of complex, familiar and presentational skills. Apply highly effective observation skills appropriate and insightful conclusions.					lities and logical thinkin r and unfamiliar situation skills and techniques	g, with evidence of origin ons. Apply highly effective s. Critical use of data	al thought, and abilit ve organizational and and results to draw
	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills. Apply effective observation skills and techniques. Correct use of data of results to draw appropriate conclusions.							
	С	C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learn outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to m familiar situations. Apply moderately effective organizational and presentational skills. Apply moderately effective observa skills and techniques. Mostly correct but some erroneous use of data and results to draw appropriate conclusions.					ly knowledge to mos effective observation	
	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills. App effective observation skills and techniques. Limited ability to use data and results to draw appropriate conclusions.					Show limited ability to skills. Apply partially		
	Fail	Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcome						
Textbooks	E. Chaisso	son and	d S. McMillan:	Astronomy -	Today (Pearson	2010)		
		E. Chaisson and S. McMillan: Astronomy Today (Pearson, 2010) www.physics.hku.hk/~nature						

PHYS0612 Revealing the Magic in Everyday Life (6 credits) Academic Year 2012							
Physics Quota							
Dr M K Yip, Physics							
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.							
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.							
On successful completion of the course, students should be able to: - describe and discuss the physical principles that are behind the household appliances and the scientific issues in daily life - demonstrate their knowledge to related topics qualitatively - criticize and express views in logical and effective ways - recognize the significance of science and technology							
NIL (Not for students who have already passed in PHYS0607 before.)							
2nd sem Examination May							
Y							
	Physics         Dr M K Yip, Physics         This course is designed for students in all disciplines and all years course covers the working principles and mechanisms of the thing and appreciation of science are emphasized with mathematics kept scientific intuition and to understand that many "magical" things in errors include: the science in the household and the science of dri are explored with simple and lucid explanations. Developments in cand the magnetic levitated trains in public transportation are introc Contents of the course are constantly updated to reflect the advance.         On successful completion of the course, students should be able to - describe and discuss the physical principles that are behind the he daily life         - demonstrate their knowledge to related topics qualitatively         - criticize and express views in logical and effective ways         - recognize the significance of science and technology         NIL (Not for students who have already passed in PHYS0607 befor         2nd sem	Physics       Quota         Dr M K Yip, Physics       This course is designed for students in all disciplines and all years who are curious about science course covers the working principles and mechanisms of the things and phenomena around us and appreciation of science are emphasized with mathematics kept at a minimum. Students are scientific intuition and to understand that many "magical" things in everyday life can be predictabl         Topics include: the science in the household and the science of driving, sports and amusement. are explored with simple and lucid explanations. Developments in optical recording, medical ima and the magnetic levitated trains in public transportation are introduced as examples of the mc Contents of the course are constantly updated to reflect the advances in modern science and tec         On successful completion of the course, students should be able to:         - describe and discuss the physical principles that are behind the household appliances and the daily life         - demonstrate their knowledge to related topics qualitatively         - criticize and express views in logical and effective ways         - recognize the significance of science and technology         NIL (Not for students who have already passed in PHYS0607 before.)         2nd sem					

Teaching Hours	48 hours of lectures and tutorials				
Assessment Method	One 1-hour written examination (50% weighting), and continuous assessment including assignments and presentation (50% weighting)				
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 abilit 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 solv problems. Organization and presentational skills are minimally effective or ineffective.				
Textbooks	Lecture notes provided by Course Coordinator L. A. Bloomfield: How Things Work: The Physics of Everyday Life (John Wiley & Sons, Inc, 2008, 3rd edition)				

PHYS0625 Physics	by inquiry (	(6 credits)	Academic Year	2012				
Offering Department	Physics		Quota					
Course Co-ordinator	Dr F K Cho	ow, Physics						
Course Aim		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	integral ca through qu	The course has a general coverage in most physics topics and is conducted with no descriptions in differential and integral calculus. Emphasis will be stressed on the understanding of various physical phenomena in daily life through qualitative and quantitative analysis. The course contents cover: Mechanics, Heat, Optics, Waves, Electricity and Magnetism.						
Learning Outcomes	<ul> <li>describe</li> <li>recognize</li> <li>explain pl</li> <li>apply the</li> </ul>	In successful completion of the course, students should be able to: describe and distinguish the concepts and principles in introductory study of physics recognize the underlying physical principles behind various daily life phenomena explain physical phenomena using proper physical laws and theories apply the fundamental techniques for quantitative analysis in solving physics problems collect and analyse the data of physics experiments						
Pre-requisites	Not for stu	e in HKCEE Phys; and dents with E or above in AL Phys; and udents who have passed in PHYS1414 or PHYS1415 or PI	HYS1417, or already	enrolled in these				
Offer in 2012 - 2013	1st sem		Examination	Dec				
Offer in 2013 - 2014	Y							
Teaching Hours	36 hours o	f lectures and tutorials						
Assessment Method		ur written examination (50% weighting), and continuous a hts, and laboratory work (50% weighting)	ssessment including	tests, homework				
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 re outcomes. Show evidence of some analytical and critical abilities and logica familiar situations. Apply moderately effective organizational and presentation	al thinking, and ability to app					
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcome						
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcome Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solv problems. Organization and presentational skills are minimally effective or ineffective.							
		problems. Organization and presentational skills are minimally effective or ine	enective.					
Textbooks		problems. Organization and presentational skills are minimally effective or incurrent of the second state						
Textbooks References	John D. Cu Paul G. He		ey & Sons, Inc., 2006) Education, Inc., 2002, 9					
	John D. Cu Paul G. He Raymond J	utnell and Kenneth W. Johnson: Essentials of Physics (John Wil ewitt: Conceptual Physics (Saunders Addison Wesley, Pearson	ey & Sons, Inc., 2006) Education, Inc., 2002, 9					

Offering Department	Physics		Physics					
Course Co-ordinator	Dr K M Lee	Dr K M Lee, Physics						
Course Aim	students th	Weather and climate play an important role in human activities and history. In this course, we shall introduce to students the fundamentals of weather, climate and climate changes, to arouse their interests in the scientific and technological advancements.						
Course Contents	humidity, o climate. T interpretati Experts fro forecasts, and climat	The course will encompass topics on: basic physical principles on weather phenomena like: wind, temperature, humidity, cold/warm fronts, thunderstorms and tropical cyclones; introductory weather analysis, forecast and climate. Through real life examples, students will get familiarized with the weather/climate science and interpretation of meteorological information, climatology and climate change. Experts from the Hong Kong Observatory (HKO) will participate in the course to cover aspects on daily weather forecasts, public weather services, local severe weather phenomena, tropical cyclones, climatology of Hong Kong, and climate change. They will also supervise course projects that involve a visit to the HKO to study the meteorological facilities and understand the operational activities on weather and climate.						
Learning Outcomes	<ul> <li>recall the</li> <li>apply the</li> <li>media</li> <li>identify an</li> <li>explain th</li> </ul>	On successful completion of the course, students should be able to: - recall the basic principles of weather and climate - apply the principles to interpret weather / climate information, for example from the HKO web site, internet o media - identify and explain the differences of weather and climate in Hong Kong as compared to other parts of the world - explain the basic causes of climate change and its potential impacts - describe and discuss the daily operational activities in the HKO						
Pre-requisites	E or above	in HKCEE Phys						
Offer in 2012 - 2013	1st sem				Examination	Dec		
Offer in 2013 - 2014	Y							
Teaching Hours	36 hours o	f lectures and tutor	ials					
Assessment Method		ur written examin ts and project (50%	ation (50% weighting), and cor % weighting)	ntinuous asses	ssment including	tests, homewor		
Course Grade	A+ to F							
Grade Descriptors	A	learning outcomes. S	gh mastery at an advanced level of exten show strong analytical and critical abilities a to a wide range of complex, familiar and	and logical thinking	, with evidence of origin	al thought, and abili		
	в	learning outcomes.	ntial command of a broad range of knowle Show evidence of analytical and critical a familiar situations. Apply effective organiza	bilities and logica	I thinking, and ability to			
	С	outcomes. Show evi	I but incomplete command of knowledge dence of some analytical and critical abilit oply moderately effective organizational an	es and logical thir	nking, and ability to app			
	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learni Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show lim apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.					how limited ability t		
	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 solv problems. Organization and presentational skills are minimally effective or ineffective.							
Textbooks	Frederick L	utgens and Edwa	d Tarbuck: The Atmosphere (Pea	rson Prentice H	lall, 2010)			

PHYS1315 Methods	in physics I (6 credits)	Academic Year	2012				
Offering Department	Physics	Quota					
Course Co-ordinator	Dr F K Chow, Physics						
Course Aim	This course provides students with experience in using mathematical tools and techniques to solve problems in physics. It is complete in itself, or may also be followed by Methods in Physics II.						
Course Contents	3D coordinate geometry; Differential and integral calculus of single variable functions with applications in physical systems; Cartesian, cylindrical and spherical coordinates; Vector functions; Partial derivatives, extremes of multivariable functions and the Taylor series in two-variable functions; Lagrange undetermined multipliers; Double and triple integrals in Cartesian, cylindrical and spherical coordinates; Calculations of centers of mass, moments of inertia and electric potentials; Solutions of ordinary differential equations in first, second and higher orders and their applications in particle dynamics, circuit theories and nuclear physics.						
Learning Outcomes	On successful completion of the course, students should be able to: - describe the connections between mathematical equations and physical problems - state and set up mathematical equations to describe the dynamics and evolution of physical systems - solve various physical problems by using suitable mathematical skills - demonstrate knowledge of choosing correct solution of mathematical equations to describe the behavior of physical systems						
Pre-requisites	(E or above in AL Pure Math or AS Math & Stat or HKCEE Add Math; Not for students who have already passed in MATH1811 before; and Not for students who have already passed in MATH1812 before.	or Pass in MATH1804); and	Ł				
Offer in 2012 - 2013	1st sem Examination Dec						
Offer in 2013 - 2014	Y						
Teaching Hours	36 hours of lectures and 12 hours of tutorials						

Assessment Method	One 2-hour written examination (50% weighting), and continuous assessment including tests and homework assignments (50% weighting)				
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.				
Textbooks	Lecture notes provided by Course Coordinator				
References	Riley K. F., Hobson M. P. and Bence S. J.: Mathematical Methods for Physics and Engineering (Cambridge, 1998) Wylie C. R. and Barrett L. C.: Advanced Engineering Mathematics (McGraw Hill, 1995) Edwards C. H. and Penney D. E.: Calculus (Prentice Hall, 2002)				
Course Website	http://www.physics.hku.hk/~phys1315/				

	in physics	II (6 credits)	Academic Year	2012				
Offering Department	Physics							
Course Co-ordinator	Dr W Yao,	Physics						
Course Aim		e provides students with experience in using mathematical too s complete in itself, or may also be taken after Methods in Phys		solve problems i				
Course Contents	and volume theorem; C Vector space	ometry in three dimensions, gradient, divergence, curl and La e integrals; Conservative fields and potentials; Green's theore curvilinear coordinates; Applications of vector calculus in clas ces and matrix algebra; Properties of some special matrices: H atic forms, eigenvalue problems and diagonalisation of matrices	m, divergence theoren ssical mechanics and Hermitian mattices and	n and the Stokes electrodynamics l unitary matrices				
Learning Outcomes	<ul> <li>describe t</li> <li>set up ar</li> <li>meanings</li> <li>calculate</li> </ul>	sful completion of the course, students should be able to: he connection between field analysis and physical problems nd calculate various differential and integral operations in fiel various matrix algebra that frequently appears in physical studie envalue problems of matrices that frequently appears in physica	es	ibe their physica				
Pre-requisites	Not for stud	e in AL Pure Math or AS Math & Stat or HKCEE Add Math; or Patents who have already passed in MATH1811 before; and dents who have already passed in MATH1812 before.	ass in PHYS1315 or M	ATH1804); and				
Offer in 2012 - 2013	2nd sem		Examination	May				
Offer in 2013 - 2014	Y							
Teaching Hours	36 hours of	lectures and tutorials						
Assessment Method		r written examination (60% weighting), and continuous asse ts (40% weighting)	essment including test	s and homewor				
Course Grade	A+ to F							
Grade Descriptors	A	Demonstrate thorough mastery at an advanced level of extensive knowledg learning outcomes. Show strong analytical and critical abilities and logical thir to apply knowledge to a wide range of complex, familiar and unfamiliar situ presentational skills.	hking, with evidence of origin	al thought, and ability				
	в	Demonstrate substantial command of a broad range of knowledge and skills		st most of the course				
		learning outcomes. Show evidence of analytical and critical abilities and lo familiar and some unfamiliar situations. Apply effective organizational and pre-						
	С		sentational skills. quired for attaining most of I thinking, and ability to app	apply knowledge to the course learning				
	C D	familiar and some unfamiliar situations. Apply effective organizational and pre Demonstrate general but incomplete command of knowledge and skills re outcomes. Show evidence of some analytical and critical abilities and logica	sentational skills. quired for attaining most of I thinking, and ability to app ial skills. r attaining some of the cours ytical and critical abilities. S	apply knowledge to the course learning ly knowledge to mos the learning outcomes show limited ability to				
		familiar and some unfamiliar situations. Apply effective organizational and pre- Demonstrate general but incomplete command of knowledge and skills re- outcomes. Show evidence of some analytical and critical abilities and logica familiar situations. Apply moderately effective organizational and presentation Demonstrate partial but limited command of knowledge and skills required fo Show evidence of some coherent and logical thinking, but with limited anal	sentational skills. quired for attaining most of I thinking, and ability to app val skills. r attaining some of the cours ytical and critical abilities. S tional and presentational skil uired for attaining the cours ery little or no ability to appl	apply knowledge to the course learning y knowledge to mos the learning outcomes how limited ability to ls.				
Textbooks	D Fail	familiar and some unfamiliar situations. Apply effective organizational and pre- Demonstrate general but incomplete command of knowledge and skills re- outcomes. Show evidence of some analytical and critical abilities and logica familiar situations. Apply moderately effective organizational and presentation Demonstrate partial but limited command of knowledge and skills required fo Show evidence of some coherent and logical thinking, but with limited anal apply knowledge to solve problems. Apply limited or barely effective organiza Demonstrate little or no evidence of command of knowledge and skills required Lack of analytical and critical abilities, logical and coherent thinking. Show v	sentational skills. quired for attaining most of I thinking, and ability to app val skills. r attaining some of the cours ytical and critical abilities. S tional and presentational skil uired for attaining the cours ery little or no ability to appl	apply knowledge to the course learning y knowledge to most the learning outcomes how limited ability to ls.				
Textbooks References	D Fail Lecture not Riley K. F., Wylie C. R.	familiar and some unfamiliar situations. Apply effective organizational and pre- Demonstrate general but incomplete command of knowledge and skills re- outcomes. Show evidence of some analytical and critical abilities and logica familiar situations. Apply moderately effective organizational and presentation Demonstrate partial but limited command of knowledge and skills required fo Show evidence of some coherent and logical thinking, but with limited anal apply knowledge to solve problems. Apply limited or barely effective organiza Demonstrate little or no evidence of command of knowledge and skills required Lack of analytical and critical abilities, logical and coherent thinking. Show v problems. Organization and presentational skills are minimally effective or ine	sentational skills. quired for attaining most of I thinking, and ability to app al skills. r attaining some of the cours ytical and critical abilities. S tional and presentational skil uired for attaining the cours ery little or no ability to appl iffective.	apply knowledge t the course learnin ly knowledge to mos se learning outcomes how limited ability t ls. e learning outcomes y knowledge to solv				

PHYS1414 General	physics I (6	credits)	Academic Year	2012
Offering Department	Physics		Quota	
Course Co-ordinator	Dr M K Yip	, Physics		
Course Aim	major build	a is the first of a two-course series designed to offer a comprehen- ing blocks of the physical laws governing nature, including mech ics, and electricity and magnetism. A calculus-based approach is a series of the series of the series of the series o	anics, thermal physic	
Course Contents	momentum	e will introduce and discuss the following topics: Dimensional ana , angular momentum and their conservation laws, system of m al field, heat and temperature, basic concepts of the laws of therm	any particles, motio	n of rigid bodies,
Learning Outcomes	<ul> <li>describe a</li> <li>apply thes</li> <li>analyse a</li> </ul>	sful completion of the course, students should be able to: and explain the physical principles of mechanics and thermodynar se principles, together with logical and mathematical reasoning, to nd solve related physical problems using the calculus-based appr nd interpret experimental data to examine the physical laws	situations of the phy	sical world
Pre-requisites	E or above	e in HKCEE Add Math or AS Math & Stat or AL Pure Math); and e in AL Phys or AS Phys or AL Eng Sc; or Pass in PHYS0114 or F lents who have already passed in PHYS1111 or PHYS1112 or Ph		314 before.
Offer in 2012 - 2013	1st sem 2	2nd sem	Examination	Dec May
Offer in 2013 - 2014	Ν			
Teaching Hours	36 hours of	lectures and tutorials; 9 hours of laboratory work		
Assessment Method		rr written examination (50% weighting), and continuous ass ts, and laboratory work (50% weighting)	essment including	tests homework
Course Grade	A+ to F			
Grade Descriptors	A	Demonstrate thorough mastery at an advanced level of extensive knowledge learning outcomes. Show strong analytical and critical abilities and logical thinkin		aining all the course
		to apply knowledge to a wide range of complex, familiar and unfamiliar situati presentational skills. Apply highly effective lab skills and techniques. Critical us insightful conclusions.	ions. Apply highly effectiv	al thought, and ability e organizational and
	В	to apply knowledge to a wide range of complex, familiar and unfamiliar situati presentational skills. Apply highly effective lab skills and techniques. Critical us	ions. Apply highly effectives e of data and results to de quired for attaining at lease at thinking, and ability to	al thought, and ability e organizational and draw appropriate and st most of the course apply knowledge to
		to apply knowledge to a wide range of complex, familiar and unfamiliar situati presentational skills. Apply highly effective lab skills and techniques. Critical us insightful conclusions. Demonstrate substantial command of a broad range of knowledge and skills re learning outcomes. Show evidence of analytical and critical abilities and logic familiar and some unfamiliar situations. Apply effective organizational and pres	ons. Apply highly effective se of data and results to of quired for attaining at lea al thinking, and ability to sentational skills. Apply efficient inking, and ability to appl skills. Apply moderately efficient	al thought, and ability e organizational and fraw appropriate and st most of the course apply knowledge to fective lab skills and the course learning y knowledge to most
	В	to apply knowledge to a wide range of complex, familiar and unfamiliar situati presentational skills. Apply highly effective lab skills and techniques. Critical us insightful conclusions. Demonstrate substantial command of a broad range of knowledge and skills re learning outcomes. Show evidence of analytical and critical abilities and logic familiar and some unfamiliar situations. Apply effective organizational and pres techniques. Correct use of data of results to draw appropriate conclusions. Demonstrate general but incomplete command of knowledge and skills requi outcomes. Show evidence of some analytical and critical abilities and logical th familiar situations. Apply moderately effective organizational and presentational	Tons. Apply highly effective e of data and results to of quired for attaining at least al thinking, and ability to sentational skills. Apply ef- ired for attaining most of inking, and ability to appl skills. Apply moderately e appropriate conclusions. ttaining some of the cours cal and critical abilities. S tional and presentational	al thought, and ability e organizational and fraw appropriate and st most of the course apply knowledge to fective lab skills and the course learning y knowledge to most iffective lab skills and e learning outcomes. how limited ability to
	B	to apply knowledge to a wide range of complex, familiar and unfamiliar situati presentational skills. Apply highly effective lab skills and techniques. Critical us insightful conclusions. Demonstrate substantial command of a broad range of knowledge and skills re learning outcomes. Show evidence of analytical and critical abilities and logic familiar and some unfamiliar situations. Apply effective organizational and pres techniques. Correct use of data of results to draw appropriate conclusions. Demonstrate general but incomplete command of knowledge and skills requi outcomes. Show evidence of some analytical and critical abilities and logical the familiar situations. Apply moderately effective organizational and presentational techniques. Mostly correct but some erroneous use of data and results to draw a Demonstrate partial but limited command of knowledge and skills required for a Show evidence of some coherent and logical thinking, but with limited analytic apply knowledge to solve problems. Apply limited or barely effective organiza-	The second secon	al thought, and ability e organizational and fraw appropriate and st most of the course apply knowledge to frective lab skills and the course learning y knowledge to most ffective lab skills and e learning outcomes. how limited ability to skills. Apply partially e learning outcomes. y knowledge to solve
Textbooks	B C D Fail	to apply knowledge to a wide range of complex, familiar and unfamiliar situati presentational skills. Apply highly effective lab skills and techniques. Critical us insightful conclusions. Demonstrate substantial command of a broad range of knowledge and skills re learning outcomes. Show evidence of analytical and critical abilities and logic familiar and some unfamiliar situations. Apply effective organizational and pres techniques. Correct use of data of results to draw appropriate conclusions. Demonstrate general but incomplete command of knowledge and skills requi outcomes. Show evidence of some analytical and critical abilities and logical thamiliar situations. Apply moderately effective organizational and presentational techniques. Mostly correct but some erroneous use of data and results to draw appropriate Show evidence of some coherent and logical thinking, but with limited analytic apply knowledge to solve problems. Apply limited or barely effective organiza effective lab skills and techniques. Limited ability to use data and results to draw Demonstrate little or no evidence of command of knowledge and skills required factive lab skills and techniques. Limited ability to use data and results to draw Demonstrate little or no evidence of command of knowledge and skills required Lack of analytical and critical abilities, logical and coherent thinking. Show very problems. Organization and presentational skills are minimally effective or inner lack.	The second secon	al thought, and ability e organizational and fraw appropriate and st most of the course apply knowledge to frective lab skills and the course learning y knowledge to most ffective lab skills and e learning outcomes. how limited ability to skills. Apply partially e learning outcomes. y knowledge to solve
Textbooks References	B C D Fail P. A. Tipler R. D. Knigh R. Resnick	to apply knowledge to a wide range of complex, familiar and unfamiliar situation presentational skills. Apply highly effective lab skills and techniques. Critical us insightful conclusions. Demonstrate substantial command of a broad range of knowledge and skills relearning outcomes. Show evidence of analytical and critical abilities and logic familiar and some unfamiliar situations. Apply effective organizational and prestechniques. Correct use of data of results to draw appropriate conclusions. Demonstrate general but incomplete command of knowledge and skills requiroutcomes. Show evidence of some analytical and critical abilities and logic familiar situations. Apply moderately effective organizational and presentational techniques. Mostly correct but some erroneous use of data and results to draw a Demonstrate partial but limited command of knowledge and skills required for a Show evidence of some coherent and logical thinking, but with limited analytic apply knowledge to solve problems. Apply limited or barely effective organizational and presentational techniques limited or barely effective and skills required for a Show evidence of some coherent and logical thinking, but with limited analytic apply knowledge to solve problems. Apply limited or barely effective organization and presentational apply knowledge and skills require Lack of analytical and critical abilities, logical and coherent thinking. Show very problems. Organization and presentational skills are minimally effective or inef lab skills and techniques. Misuse of data and results and/or unable to draw appropriate lab skills and techniques. Isolate and results and/or unable to draw approprint and presentational axills are minimally effective or inef lab skills and techniques. Misuse of data and results and/or unable to draw approprinte approprint and presentational skills are minimally effective or inef lab skills and techniques. Isolate and results and/or unable to draw approprinte approblems.	ions. Apply highly effective e of data and results to of quired for attaining at lear at thinking, and ability to sentational skills. Apply ef- ired for attaining most of inking, and ability to appl skills. Apply moderately e appropriate conclusions. ttaining some of the cours cal and critical abilities. S appropriate conclusions. ttaining the cours appropriate conclusions. d for attaining the cours little or no ability to appl fective. Apply minimally e opriate conclusions. 1008, 6th edition) n) ns, 2002, 5th edition	al thought, and ability e organizational and fraw appropriate and st most of the course apply knowledge to fective lab skills and the course learning y knowledge to most iffective lab skills and e learning outcomes. how limited ability to skills. Apply partially e learning outcomes. y knowledge to solve ffective or ineffective

PHYS1415 General	ohysics II (6 credits)	Academic Year	2012
Offering Department	Physics	Quota	
Course Co-ordinator	Dr J C S Pun, Physics		
Course Aim	This course is the second of a two-course series designed to off the major building blocks of the physical laws governing nature and waves, optics, and electricity and magnetism. A calculus-ba	e, including mechanics, thermal p	
Course Contents	This course will introduce and discuss the following topics: Cou capacitance, electric current and circuit, magnetic field and Arr law, Maxwell's equations, oscillations and waves, wave nature of	npere's law, Faraday's law, induc	ctance and Lenz's
Learning Outcomes	On successful completion of the course, students should be able - describe and explain the physical principles of electricity and m - apply these principles, together with logical and mathematical - analyse and solve related physical problems using the calculus - acquire and interpret experimental data to examine the physical	nagnetism, oscillations, waves, ar reasoning, to situations of the phy s-based approach	
Pre-requisites	(E or above in HKCEE Add Math or AS Math & Stat or AL Pure (E or above in AL Phys or AS Phys or AL Eng Sc; or Pass in PH Not for students who have already passed in PHYS1111 or PHY	IYS0115 or PHYS0625); and	314 before.
Offer in 2012 - 2013	2nd sem	Examination	May

Offer in 2013 - 2014	Ν
Teaching Hours	36 hours of lectures and tutorials; 9 hours of laboratory work
Assessment Method	One 2-hour written examination (50% weighting), and continuous assessment including tests, homework assignments, and laboratory work (50% weighting)
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.
	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 eroneous 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.
Textbooks	P. A. Tipler and G. Mosca: Physics for Scientists and Engineers (Freeman, 2008, 6th edition)
References	<ul> <li>R. D. Knight: Physics for Scientists and Engineers (Pearson, 2008, 2th edition)</li> <li>R. Resnick, D. Halliday, and K. Krane: Physics Volume 2 (John Wiley and Sons, 2002, 5th edition)</li> <li>R. Serway and J. W. Jewett: Physics for Scientists and Engineers (Thomson, 2004, 5th edition)</li> </ul>
Course Website	http://www.physics.hku.hk/~phys1415/

PHYS1417 Basic ph	ysics (6 cr	credits)	5)							4	Academic Year	20	12	
Offering Department	Physics										Quota			
Course Co-ordinator	Dr S J Xu	lu, Physio	ics											
Course Aim	rather tha	an rigoro		atical treat	ments.	It serv	/es as				phases placed o dents who are in			
Course Contents		Mechanics (linear and circular motion, simple harmonic motion, Newton's law, momentum, and energy), Wave ar Optics, Thermal Physics, Electromagnetism and an introduction to Modern Physics.												
Learning Outcomes	<ul> <li>describe</li> <li>apply the</li> <li>explain r</li> </ul>	be the fur hese prir real-wo	ompletion of t indamental pr inciples to solv orld physical p terpret experir	inciples of ve basic pl bhenomena	physic hysics a	s proble	ms			laws				
Pre-requisites	Not for si PHYS111	students	YS1112, PHY	already p S1113, PH	assed HYS14	in any 13; and	y of tl d	he follo	wing co	ourses	s before: PHYS	,		S011
Offer in 2012 - 2013	1st sem	2nd se	em							1	Examination	De	ec N	lay
Offer in 2013 - 2014	N													
Teaching Hours	36 hours of	s of lectu	ure, 2 hours o	f tutorials,	and 6	hours	of labo	oratory	work					
Assessment Method			ten examinati vork (15% wei		weightir	ng), co	ourse v	work in	luding	home	work and quizze	s (25%	% wei	ghting
Course Grade	A+ to F													
Grade Descriptors	A	learni to ap prese	ning outcomes. S pply knowledge t	how strong a to a wide rar Apply highly	analytical	l and crit omplex,	tical abi familiar	lities and and unf	logical thi amiliar sit	nking, v uations	skills required for a with evidence of orig . Apply highly effect f data and results to	nal tho	ught, ai anizatio	nd abili onal an
	В	learni famili	ning outcomes. S	Show eviden nfamiliar situa	ce of an ations. A	alytical	and crit ective o	tical abilit rganizati	ies and lo onal and p	ogical t	ed for attaining at le hinking, and ability ational skills. Apply	o apply	y know	ledge t
	с	outco famili	omes. Show evic liar situations. Ap	dence of som	ne analyt ely effect	tical and tive orga	l critical anizatior	abilities nal and p	and logica resentatio	al thinki nal skil	for attaining most of ng, and ability to ap ls. Apply moderately opriate conclusions.	oly kno	wledge	to mos
	D	Show apply	w evidence of so y knowledge to s	ome coheren solve probler	it and log ms. Appl	gical thir ly limited	nking, b d or bar	ut with li rely effec	nited ana tive orgar	lytical a	ing some of the cou and critical abilities. al and presentationa propriate conclusions	Show I I skills.	imited a	ability t
											or attaining the cour e or no ability to ap			

	Fail	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.
Textbooks	Lecture not	es provided by course coordinator
References	Alan Giamb	attista, Betty Richardson and Robert C. Richardson: Physics (McGraw-Hill, 2004)
Course Website	http://www.	physics.hku.hk/~phys1417/
Remarks	The HKU-S	PACE course College Physics I or II, PHYS1413 and PHYS1417 are mutually exclusive.

	sical univer	erse (6	6 credits)					Academic Year	2012
Offering Department	Physics							Quota	
Course Co-ordinator	Dr K M Lee	ee, Phy	/sics						
Course Aim			ne underlyin me basic sc			f astronomy	. This course	is designed for se	cond or third y
Course Contents		g cross	s section ar					elescopes, basic ce participate actively	
Learning Outcomes	<ul> <li>calculate</li> <li>describe</li> <li>derive the</li> </ul>	e the tra the for ne orbit	ansformation rmation of s ts in two boo	n between pectral line dy problem	e, students sl different cele es and basic s from first prir s section and	estial coordir structures of nciple	ate systems telescopes		
Pre-requisites	Pass in PH	HYS00	001 or PHYS	50003					
Offer in 2012 - 2013	1st sem							Examination	Dec
Offer in 2013 - 2014	Y								
Teaching Hours	36 hours o	of lectu	ures and tuto	orials; 4 ho	urs of night s	ky observati	on		
Assessment Method			tten examin )% weighting		% weighting),	, and contin	uous assessi	ment including tes	ts and homewo
				y)					
Course Grade	A+ to F		0	9)					
Course Grade Grade Descriptors	A+ to F	learn to ap prese	ning outcomes. oply knowledge	ugh mastery Show strong e to a wide ra ls. Apply higl	analytical and c ange of complex hly effective ob	ritical abilities a k, familiar and	nd logical thinkin unfamiliar situatio	and skills required for a g, with evidence of origi ons. Apply highly effect s. Critical use of data	nal thought, and ab ve organizational a
		learn to ap prese appro Dem learn famil	ning outcomes. oply knowledge entational skill opriate and ins nonstrate substa- ning outcomes. liar and some	ugh mastery Show strong e to a wide ra ls. Apply higl ightful conclu antial commu . Show evide unfamiliar sit	analytical and c ange of complex hly effective ob sions. Ind of a broad ra nce of analytica quations. Apply 6	ritical abilities a k, familiar and servation skills ange of knowle al and critical a effective organi	nd logical thinkin unfamiliar situatio and techniques dge and skills rec bilities and logica	g, with evidence of origi ons. Apply highly effect s. Critical use of data quired for attaining at le al thinking, and ability t sentational skills. Apply	nal thought, and ab ve organizational a and results to dra ast most of the cou o apply knowledge
	A	learn to ap prese appro Dem famil skills Dem outco famil	hing outcomes, pply knowledge entational skill opriate and ins ionstrate substr hing outcomes. liar and some and technique ionstrate gener liar situations, a	ugh mastery Show strong to a wide ra ls. Apply higl ightful conclu antial comma Show evide unfamiliar sit as. Correct us ral but incom vidence of so Apply modera	analytical and c ange of complex hly effective ob sions. Ind of a broad re nce of analytica uations. Apply e e of data of resu- plete command me analytical ar ately effective or	ritical abilities a x, familiar and servation skills ange of knowle and critical a effective organ lds to draw app of knowledge nd critical abiliti ganizational ar	nd logical thinkin unfamiliar situatic and techniques dge and skills rec bilities and logica zational and pre- ropriate conclusic and skills requir es and logical thi d presentational	g, with evidence of origi ons. Apply highly effect s. Critical use of data quired for attaining at le al thinking, and ability t sentational skills. Apply	nal thought, and ab ve organizational a and results to dra- ast most of the cou o apply knowledge effective observat of the course learn oly knowledge to m effective observat
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	A B C D Fail	learn to as approver learn famil skills Dem outcc famil skills Dem Shov apply effect Dem Lack probl	ning outcomes. poply knowledge entational skill opriate and ins insonstrate substraining outcomes. iar and some s and technique onstrate generic omes. Show evi- iliar situations a and technique insortate partia a onstrate partia onstrate partia onstrate partia i onstrate terta v evidence of i y knowledge tc tive observatio onstrate little c of of analytical a lems. Organizz	ugh mastery Show strong e to a wide ra ls. Apply higl ightful conclu antial comma . Show evide unfamiliar sit as. Correct us ral but incom vidence of so Apply modera as. Mostly corr l but limited c some cohere to solve proble on skills and te or no evidenc and critical ab ation and pres nd techniques	analytical and c ange of complex hly effective ob sions. Ind of a broad ra- nce of analytica uations. Apply c e of data of resu- plete command me analytical ar ately effective or rect but some er command of kno- nt and logical tt exchniques. Limit ze of command illities, logical an sentational skills s. Misuse of data	ritical abilities a k, familiar and servation skills ange of knowle al and critical a effective organ effective organ of knowledge nd critical abiliti ganizational ar roneous use of wledge and ski ed or barely ef ed ability to use of knowledge d coherent thir s are minimally	nd logical thinkin unfamiliar situatio and techniques dge and skills rec bilities and logica zational and pre: ropriate conclusic and skills require es and logical thi d presentational data and results ls required for atth n limited analytic fective organizati data and results and skills require king. Show very effective or ineffe	g, with evidence of origi ons. Apply highly effect s. Critical use of data quired for attaining at lea al thinking, and ability t sentational skills. Apply ons. ed for attaining most of nking, and ability to app skills. Apply moderately to draw appropriate cor- aining some of the cour al and critical abilities. onal and presentationa to draw appropriate cor- d for attaining the cour. little or no ability to app ective. Apply minimally	nal thought, and ab ve organizational a and results to dra- ast most of the cou o apply knowledge effective observat of the course learn oly knowledge to m effective observat clusions. se learning outcom Show limited ability I skills. Apply parti- clusions. se learning outcom ly knowledge to sc effective or ineffect
Grade Descriptors	A B C D Fail Lecture no	learm to ap press appro Dem learm famil skills Dem Shov apply effec Dem Lack probl obse	ning outcomes. pply knowledge entational skill opriate and ins nonstrate substr ining outcomes. iar and some iar and technique nonstrate gener omstrate gener onstrate partia a and technique to other and the some iar and technique iar and technique to other and the some a dems. Organizz ervation skills ar rovided by co	ugh mastery Show strong e to a wide ra ls. Apply higl ightful conclu antial comma . Show evide unfamiliar sit as. Correct us ral but incom vidence of so Apply modera s. Mostly corr I but limited c some cohere o solve proble on skills and te or no evidenc and critical ab cor no evidence and critical ab correct coorr	analytical and c ange of complex hly effective ob sions. Ind of a broad ra nce of analytica uations. Apply d e of data of resu uplete command me analytical ar ately effective or rect but some er command of know nt and logical th ems. Apply limit achniques. Limit coniques. Limit conital skills s. Misuse of data	ritical abilities a k, familiar and ange of knowle I and critical a effective organ effective organ of knowledge nd critical abiliti ganizational ar roneous use of wledge and ski ed or barely ef ed ability to use of knowledge ed ability to use of knowledge and a and results ar	nd logical thinkin unfamiliar situatio and techniques dge and skills rec bilities and logica zational and pre: ropriate conclusic and skills require es and logical thi d presentational data and results ls required for atth n limited analytic fective organizati data and results and skills require king. Show very effective or ineff d/or unable to dra	g, with evidence of origi ons. Apply highly effect s. Critical use of data quired for attaining at lea al thinking, and ability t sentational skills. Apply ons. ed for attaining most of nking, and ability to app skills. Apply moderately to draw appropriate cor- aining some of the cour al and critical abilities. onal and presentationa to draw appropriate cor- d for attaining the cour. little or no ability to app ective. Apply minimally	nal thought, and ab ve organizational a and results to dri- ast most of the cou o apply knowledge effective observat of the course learn oly knowledge to m effective observat clusions. se learning outcom Show limited ability I skills. Apply partia clusions. se learning outcom ly knowledge to sc effective or ineffect ons.

PHYS2022 Observation	ional astronomy (6 credits)	Academic Year	2012
Offering Department	Physics	Quota	30
Course Co-ordinator	Dr J J L Lim, Physics		
Course Aim	This course aims to introduce to the students the tools of contemporary obs the physics of light detection at radio, infrared, visible, X-ray, and gamma-r and techniques used for observations of celestial objects over the full ran- emphasis is on a hands-on approach for students to gain experience in doin reduction.	ay wavelengths, and	d the instruments ic radiation. The
Course Contents	This course will introduce and discuss the following topics: properties and properties of light, atmospheric effects on observations; non-optical tele detectors (PMT, CCD); astronomical imaging and magnitude system; astron stars and galaxies including blackbody radiation, color-magnitude system, er astronomical redshifts; cosmological observations.	scopes; properties omical spectroscopy	of astronomical ; observations of
Learning Outcomes	On successful completion of the course, students should be able to: - describe and explain the workings of astronomical telescopes (operating in	optical and non-opt	ical wavelengths)

	<ul> <li>describe</li> <li>understa</li> <li>stars, gala</li> <li>prepare a</li> <li>materials in</li> </ul>	the effects of the Ea nd how the methods xies, and the univers a presentation on th n research literature	tors (PMT and CCD) th's atmosphere on astronomical of astronomical photometry ar e e observational aspects of cele ope to conduct simple night sky o	nd spectroscop stial objects us	, ,,			
Pre-requisites	Pass in PH	IYS0001 or PHYS00	02 or PHYS0003					
Offer in 2012 - 2013	1st sem				Examination	Dec		
Offer in 2013 - 2014	Υ							
Teaching Hours	36 hours o	f lectures and tutoria	ls; 6 hours of laboratory work					
Assessment Method			on (50% weighting), and contir on, and laboratory works (50% v		nent including mic	I-term, homework		
Course Grade	A+ to F							
Grade Descriptors	A	A Demonstrate thorough mastery of 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	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills. Apply effective observation skills and techniques. Correct use of data of results to draw appropriate conclusions.						
	С	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	Show evidence of som apply knowledge to so	limited command of knowledge and ski e coherent and logical thinking, but wit ve problems. Apply limited or barely e ills and techniques. Limited ability to use	h limited analytica ffective organization	I and critical abilities.	Show limited ability to skills. Apply partially		
	Fail	Lack of analytical and problems. Organization	b evidence of command of knowledge pritical abilities, logical and coherent thin and presentational skills are minimally achniques. Misuse of data and results and and results and resu	hking. Show very I effective or ineffe	ittle or no ability to app ctive. Apply minimally	ly knowledge to solve effective or ineffective		
Textbooks	Andrew J.	Norton: Observing th	e Universe (Cambridge Univers	ity Press, 2004	•)			
References			s: A Physical Approach to Astror Astrophysics (Cambridge Unive			University, 2004)		
Course Website	http://www	.physics.hku.hk/~phy	vs2022/					

PHYS2039 Principle	s of astron	omy (6 credits)		Academic Year	2012			
Offering Department	Physics							
Course Co-ordinator	Dr J J L Lir	, Physics						
Course Aim	To introduc used in ast		of contemporary astrophysics	s a number of basic physic	al principles wide			
Course Contents			spectral lines, thermal Maxw ers, celestial mechanics, idea					
Learning Outcomes	- differentia - sensibly s	e between thermal and non uggest which telescopes to l	<ul> <li>students should be able to:</li> <li>-thermal radiative processes</li> <li>best use to measure different vsical settings on the topics in</li> </ul>	astrophysical quantities				
Pre-requisites	Pass in PH	/S1413 or PHYS1414 or PH	HYS1415 or PHYS1417					
Offer in 2012 - 2013	2nd sem			Examination	May			
Offer in 2013 - 2014	Y							
Teaching Hours	36 hours o	lectures and tutorials						
Assessment Method		written examination (60% s (40% weighting)	weighting), and continuous	assessment including te	sts and homewor			
Course Grade	A+ to F							
Grade Descriptors	A	strong analytical and critical ability	of the knowledge and skills require ties, clear logical thinking, evidence and unfamiliar situations using highly	of original thought, and ability to	apply knowledge to			
	В	Show evidence of analytical and o	nd of the knowledge and skills requ critical abilities, reasoned logical thin ve organizational and presentation sk	king, and ability to apply knowled				
	с	outcomes. Show evidence of so	blete command of knowledge and s me analytical and critical abilities, ely effective organizational and prese	logical thinking, and ability to ap				
	D	Show evidence of some coheren	ommand of knowledge and skills req nt and logical thinking, but with limit ns using limited or barely effective or	ed analytical and critical abilities.	Show limited ability t			
	Fail		e of command of knowledge and sk lities, logical and coherent thinking.					

	problems. Organization and presentational skills are minimally effective or ineffective.
Textbooks	Bradley W Carroll and Dale A. Ostlie: An Introduction to Modern Astrophysics (Addison-Wesley, 2007, 2nd edition), and Lecture notes provided by course coordinator
References	TBC
Course Website	http://www.physics.hku.hk/~phys2039

	,	state	physics (6 o	credits)			Academic Year	2012
Offering Department	Physics						Quota	
Course Co-ordinator	Prof J Gao	ao, Phys	sics					
Course Aim	is designe	ed as a		ed course wh			operties of the solid a basis for more a	
Course Contents	electron t	Crystal structures and symmetry. The reciprocal lattice and X-ray diffraction in crystals. Lattice vibrations. Fre electron theory of metals. Energy bands; metals, semiconductors, and insulators. Dielectric and magneti properties.						
Learning Outcomes	<ul> <li>demonst</li> <li>describe</li> <li>apply physical</li> <li>apply estimation</li> </ul>	strate kn e the be hysical p ssential	nowledge for or havior of solid principles and skills of making	crystal structu d matter and mathematica ng measurem	al equations to c ents with appro	erization erlying physical cor liscuss the physica priate instruments	ncepts I properties of mate in physics experime g physical principle	
Pre-requisites			13 or PHYS1 27, or already		61414 and PHY his course.	S1415); and		
Offer in 2012 - 2013	1st sem						Examination	Dec
Offer in 2013 - 2014	Y							
Teaching Hours	36 hours o	of lectu	ires, tutorials,	and laborato	ry work			
Assessment Method			en examination aboratory wor			work including tes	ts and homework a	ssignments (30 <sup>o</sup>
Course Grade	A+ to F							
Grade Descriptors	A	learn to ap prese	ing outcomes. Shoply knowledge to	now strong analy a wide range Apply highly effe	tical and critical abi of complex, familia	lities and logical thinking and unfamiliar situation	nd skills required for att g, with evidence of origin ons. Apply highly effectiv e of data and results to o	al thought, and abilitive organizational and
Grade Descriptors	A B	learn to ap prese insigl Demo learn famili	ing outcomes. Sh pply knowledge to entational skills. / htful conclusions. onstrate substant ing outcomes. S iar and some uni	now strong analy o a wide range of Apply highly effe tial command of how evidence o familiar situation	tical and critical abi of complex, familiar ctive lab skills and a broad range of k f analytical and crit	lities and logical thinking and unfamiliar situation techniques. Critical use nowledge and skills req ical abilities and logica rganizational and press	g, with evidence of origin ons. Apply highly effectiv	al thought, and abilit e organizational and draw appropriate an st most of the cours apply knowledge to
Grade Descriptors		learn to ap prese insigl Deme learn famili techr	ing outcomes. Sh ply knowledge tr antational skills. / htful conclusions. onstrate substant ing outcomes. S iar and some uni niques. Correct us onstrate general omes. Show evid iar situations. App	how strong analy o a wide range ( Apply highly effe- tial command of how evidence o familiar situation se of data of resu- but incomplete ence of some ar ply moderately e	tical and critical abi of complex, familiar ctive lab skills and a broad range of k f analytical and crit s. Apply effective o ults to draw appropr command of know lalytical and critical fective organization	lities and logical thinkinn and unfamiliar situatic techniques. Critical uso nowledge and skills req ical abilities and logica rganizational and press iate conclusions. ledge and skills requir abilities and logical thi	g, with evidence of origin ns. Apply highly effective e of data and results to of uired for attaining at lease at thinking, and ability to entational skills. Apply effect ed for attaining most of nking, and ability to appli kills. Apply moderately effect.	al thought, and abilit e organizational an- draw appropriate an st most of the cours apply knowledge to ffective lab skills an the course learning y knowledge to mos
Grade Descriptors	В	learn to ap prese insigl Derm famili techr Derm outcc famili techr Derm Show apply	ing outcomes. Sh pipy knowledge tr entational skills. / httful conclusions. onstrate substant ing outcomes. S iar and some unl iques. Correct us onstrate general mes. Show evid iar situations. App iques. Mostly co onstrate partial b v evidence of soi / knowledge to s	how strong analy o a wide range é Apply highly effe tial command of how evidence o familiar situation se of data of resu but incomplete ence of some ar ply moderately e rrect but some e ut limited comma me coherent and olve problems.	tical and critical abi of complex, familiar ctive lab skills and a broad range of k f analytical and critical facture and critical s. Apply effective of ults to draw appropr command of know alytical and critical ffective organization roneous use of dat and of knowledge ai d logical thinking, b Apply limited or bai	lities and logical thinkinn and unfamiliar situatic techniques. Critical use nowledge and skills requirad abilities and logica granizational and prese iate conclusions. ledge and skills requir abilities and logical thi al and presentational s a and results to draw ap nd skills required for att ut with limited analytica ely effective organizati	g, with evidence of origin ns. Apply highly effective e of data and results to of uired for attaining at lease at thinking, and ability to entational skills. Apply effect ed for attaining most of nking, and ability to appli kills. Apply moderately effect.	al thought, and abilit e organizational and draw appropriate an st most of the cours apply knowledge to ffective lab skills an the course learning y knowledge to mos ffective lab skills an e learning outcomes how limited ability t
Grade Descriptors	B C	learn to ap press insigl Derm famili techr Derm Show apply effec Derm Lack probl	ing outcomes. Sr ipply knowledge intational skills. / httful conclusions. onstrate substant ing outcomes. S iar and some unl ingues. Correct us onstrate general omes. Show evid iar situations. App inques. Mostly co onstrate partial bi v evidence of so / knowledge to s tive lab skills and onstrate little or i of analytical and ems. Organizatic	how strong analy o a wide range d Apply highly effe- tial command of how evidence o familiar situation se of data of resu- but incomplete ence of some ar ply moderately e trect but some e ut limited comma me coherent and olve problems. I techniques. Lim no evidence of 0 to critical abilities, on and presental	tical and critical abi of complex, familia ctive lab skills and a broad range of k f analytical and cri is. Apply effective o list to draw appropr command of know halytical and critical ffective organizatio rroneous use of dat and of knowledge and l logical thinking, b Apply limited or ban tied ability to use d command of knowle logical and cohere ional skills are min	lities and logical thinking and unfamiliar situatic techniques. Critical use nowledge and skills requir ganizational and prese tate conclusions. ledge and skills requir abilities and logical thi al and presentational s a and results to draw ap and skills required for att ut with limited analytica rely effective organizati ata and results to draw as adge and skills required	g, with evidence of origin ns. Apply highly effective e of data and results to of uired for attaining at lease al thinking, and ability to entational skills. Apply effective ed for attaining most of nking, and ability to appl kills. Apply moderately e opropriate conclusions. aining some of the coursa al and critical abilities. Sonal and presentational appropriate conclusions. d for attaining the courss. d for attaining the courss. ititle or no ability to appl active. Apply minimally effortant and the course.	al thought, and abilit e organizational and draw appropriate an st most of the cours apply knowledge to ffective lab skills an the course learning y knowledge to mos offective lab skills an e learning outcomes how limited ability t skills. Apply partiall e learning outcomes y knowledge to solv
Grade Descriptors	B C D Fail	learn to ap press insigl Demu learn famili techr Demu Show apply effec Demu Lack probl	ing outcomes. SN ply knowledge tr intational skills. / httful conclusions. onstrate substant ing outcomes. S ar and some uni niques. Correct us onstrate general mes. Show evid ar situations. App iques. Mostly co onstrate partial b v evidence of soo v knowledge to s tive lab skills and onstrate little or of analytical and ems. Organizatic kills and techniqu	now strong analy o a wide range of Apply highly effe- tial command of how evidence o familiar situation se of data of resu- but incomplete ence of some ar ply moderately e rrect but some e ut limited comma me coherent and olve problems. J techniques. Lim no evidence of of critical abilities, on and presental ies. Misuse of da	tical and critical abi of complex, familia ctive lab skills and a broad range of k f analytical and cri is. Apply effective o list to draw appropr command of know halytical and critical ffective organizatio rroneous use of dat and of knowledge and l logical thinking, b Apply limited or ban tied ability to use d command of knowle logical and cohere ional skills are min	ities and logical thinking and unfamiliar situatic techniques. Critical use nowledge and skills requir cical abilities and logica ganizational and prese iate conclusions. Iedge and skills require abilities and logical thi al and presentational se and results to draw ar nd skills required for att ut with limited analytic rely effective organizati at and results to draw ar adge and skills requirent thinking. Show very mally effective or ineffe or unable to draw appro-	g, with evidence of origin ns. Apply highly effective e of data and results to of uired for attaining at lease al thinking, and ability to entational skills. Apply effective ed for attaining most of nking, and ability to appl kills. Apply moderately e opropriate conclusions. aining some of the coursa al and critical abilities. Sonal and presentational appropriate conclusions. d for attaining the courss. d for attaining the courss. ititle or no ability to appl active. Apply minimally effortant and the course.	al thought, and abilit e organizational and draw appropriate an st most of the cours apply knowledge to ffective lab skills an the course learning y knowledge to mos offective lab skills an e learning outcomes how limited ability t skills. Apply partiall e learning outcomes y knowledge to solv

PHYS2222 Waves a	HYS2222 Waves and optics (6 credits)					
Offering Department	Physics Quota					
Course Co-ordinator	Dr J K C Leung, Physics					
Course Aim	To give a coherent introduction to the development of modern physical or properties of light and optic application	optics, with particular att	ention to the wave			
Course Contents	mathematical theory of wave motion and the electromagnetic theory of of reflection and refraction; superposition and Fourier analysis of wave applications of polarization, interference and diffraction, thick lenses					
Learning Outcomes	On successful completion of the course, students should be able to: - explain and calculate the properties of waves including propaga interference and diffraction by using the theory of waves. - apply the theory of optics to calculate the geometrical parameters of thi - apply essential theories to design anti-reflection and reflection-enhanced	ck lenses and design op				
Pre-requisites	Pass in PHYS1413 or PHYS1417 or (PHYS1414 and PHYS1415)					

Offer in 2012 - 2013	1st sem	1st sem Examination Dec					
Offer in 2013 - 2014	Y	Y					
Teaching Hours	36 hours	s of lectures and tutorials					
Assessment Method	One 2-h	our written examination (75% weighting), and continuous assessm	ent (25% weighting)				
Course Grade	A+ to F						
Grade Descriptors	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original th to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective or presentational skills.						
	в	Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.					
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.					
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.					
	Fail	Demonstrate little or no evidence of command of knowledge and skills requ Lack of analytical and critical abilities, logical and coherent thinking. Show v problems. Organization and presentational skills are minimally effective or ine	ery little or no ability to ap				
Textbooks	Eugene	Eugene Hecht: Optics, (Addison-Wesley, 2001, 4th ed.)					
References	R. Guen	ther: Modern Optics (John Wiley, 1990)					

	d spectros	scopy	spectroscopy (6 credits)				Academic Yea	r	2012			
Offering Department	Physics				Quota							
Course Co-ordinator	Dr S J Xu, Physics											
Course Aim	The course	se aim	ns at prov	viding a br	road intr	roductior	n to majoi	types of la	isers and	d modern laser s	pec	troscopy.
Course Contents		es. Las	asers as a	spectrosc	copic lig	ht sourc	es. Com	ponents of	spectro	scopic instrume		nd spectroscopi Spectroscopy c
Learning Outcomes		the pro e funda strate s main c laser p	operties of damental of solid know compone photolum	of fundam operation wledge of nts of mod inescence	nental op principl f moderr odern op æ setup	ptical pro le of moc n laser sp ptical spe to meas	ocesses dern laser pectrosco ectroscopi sure low-te	s pic techniq c instrumer emperature	nts photolu	minescence spe g physical princi		of solid sample
Pre-requisites	Pass in PH Pass in PH						urse.					
Offer in 2012 - 2013	Not offered	ed								Examination		To be confirmed
Offer in 2013 - 2014	Y											
Teaching Hours	32 hours o	of lect	ctures and	I tutorials;	32 hours of lectures and tutorials; 4 hours of laboratory work							
	One 2-hour written examination (50% weighting), and continuous assessment including tests, homework assignments and laboratory work (50% weighting)						natory wo					
Assessment Method					n (50%	weighti	ting), and		us asse	ssment includir	ng t	ests, homework
Assessment Method Course Grade					n (50%	weighti	ting), and		us asse	ssment includir	ng t	ests, homeworł
	assignmen	Den lear to a pres	emonstrate t arning outco apply know	tory work thorough ma mes. Show ledge to a v skills. Apply	n (50% k (50% w astery at strong an wide rang	an advance an of comp	ting), and g) ced level of id critical ab plex, familia	extensive kn litites and logi r and unfamil	owledge a cal thinking	nd skills required fo g, with evidence of c ns. Apply highly eff	or att rigin	ests, homework aining all the course al thought, and abilit e organizational and fraw appropriate and
Course Grade	assignmen A+ to F	Den lear to a pres insig	and labora	tory work thorough ma mes. Show ledge to a skills. Apply dusions. substantial c mes. Show ome unfamil	n (50% (50% w strong an wide rang ly highly e command v evidence iliar situati	an advance an advance alytical and ge of comp effective lal I of a broace e of analytitions. Apply	ting), and ced level of d critical ab plex, familia b skills and d range of <i>H</i> tical and cr y effective of	extensive kn lities and logi r and unfamil techniques. ( nowledge and tical abilities	owledge a cal thinkin liar situatio Critical use d skills rec and logica and prese	and skills required for g, with evidence of of ons. Apply highly eff e of data and results juired for attaining a al thinking, and abil	or att rigin ectiv s to c t leas ty to	aining all the course al thought, and abilit e organizational and
Course Grade	A+ to F	Den lear to a pres insig Den lear fam tect Den outt	nd labora emonstrate t arning outco apply know esentational sightful conce emonstrate g arning outco miliar and so chniques. Co emonstrate g tcomes. Sho miliar situati	tory work thorough ma mes. Show s ledge to a v skills. Apply lusions. substantial c mes. Show ome unfamil prrect use of general but ow evidence ons. Apply n	n (50% (50% w astery at strong an wide rang ly highly e command v evidence illar situati of data of ri t incomple e of some moderate!	an advance an advance alytical anne ge of comp effective lal d of a broace e of analyt tions. Apply results to d ete comma e analytical ly effective	ting), and ced level of d critical ab loex, familia b skills and d range of I y effective raw approp and of know I and critica	extensive kn litties and logi r and unfamil techniques. ( nowledge and riate conclusic vledge and sł l abilities and prese	owledge a cal thinkin liar situatic Critical use d skills reca and logica and preso ons. kills requir logical thi nutational s	and skills required for g, with evidence of cons. Apply highly eff e of data and result quired for attaining a al thinking, and abili entational skills. App ed for attaining mo nking, and ability to	or att rigina ectiv s to c t leas ty to c bly ef appl ely e	aining all the course al thought, and abilit e organizational and fraw appropriate and st most of the course apply knowledge to
Course Grade	A+ to F A B	Dents an lear to a prese insig Den lear fam tect Den Sho app	nd labora emonstrate t arning outco apply know esentational sightful conc emonstrate g anning outco miliar and so chniques. Co emonstrate g noil a situatio chniques. Ma emonstrate p now evidenc	tory work thorough ma mes. Show s ledge to a v skills. Apply dusions. substantial c mes. Show ome unfamil prrect use of general but ow evidence ons. Apply n ostly correct partial but line se of some c	n (50% (50% w astery at strong an wide rang ly highly e command v evidence illar situati of data of r t incomple e of some moderatel t but some mited com coherent e problem:	an advance nalytical and ge of comp effective laid of a broace e of analyti tions. Apply results to di ete comma e analytical ly effective e erroneou mmand of k and logica s. Apply in	ting), and ced level of id critical ab plex, familia b skills and d range of I tical and cri y effective e traw approp and of know and of know organizatic us use of da snowledge a al thinking, I mited or ba	extensive kn lities and logir r and unfamil techniques. ( nowledge and tical abilities organizational riate conclusio vledge and ski abilities and nal and prese ta and results md skills requ but with limite rely effective	owledge a cal thinkin lar situatic Critical use d skills rec and logica and prese ons. kills requir logical thi logical thi logical thi logical thi d ranulyticc d analyticc	and skills required for g, with evidence of c nos. Apply highly eff e of data and results uured for attaining a al thinking, and abili entational skills. App ed for attaining mo nking, and ability to skills. Apply moderal opropriate conclusio aining some of the c al and critical ability	or atti rigina ectiv s to c t leas ty to c t leas ty to c appl ely e appl ely e ns. cours ses. S conal	aining all the course al thought, and abilit e organizational and traw appropriate and st most of the course apply knowledge to fective lab skills and the course learning y knowledge to mos
Course Grade	A+ to F A B C	Dents an leants an response insignation fam tech Den outt fam tech Den outt fam tech Den outt fam tech Den outt fam tech Den lear fam tech fam tech Den lear fam tech tech tech tech tech tech tech tech	nd labora emonstrate t arring outco apply know esentational sightful conc emonstrate s arning outco miliar and sc chniques. Co emonstrate g chniques. Me miliar situatio chniques. Me emonstrate g ply knowled ective lab sh emonstrate l tock of analyt	thorough ma mes. Show si ledge to a v skills. Apply dusions. substantial comes. Show ome unfamil orrect use of general but mostly correct ons. Apply n ostly correct on a vidence ons. Apply n ostly correct is of some of get o solve kills and tech little or no e ical and criti janization ar	n (50% (50% w astery at strong an wide rang ly highly e command v evidence illiar situati of data of r t incomple e of some moderatel t but some mited com coherent shniques. I evidence of tical abiliti and preser	an advance nalytical and ge of comp effective lal of a broace of a analytical of a broace of a nalytical of a broace of a nalytical by effective e erroneou mmand of k and logical Limited abi of commar- ies, logical ntational sk	ced level of d critical ab plex, familia b skills and d range of H tical and cr y effective organizatic as use of da schowledge a and of know l and critica organizatic us use of da schowledge a l thinking, mited or ba lifty to use d nd of knowl a and coherr kills are mit	extensive kn lities and logir r and unfamil techniques. ( nowledge and tical abilities organizational riate conclusic vledge and sk l abilities and nal and prese ta and results ind skills requirant with limite rely effective ata and result edge and sk ils requirant edge and sk ils requirant edge and sk ils refective ata and result edge and sk imiter rely effective ata and reffective imiter rely effective ata and reffective ata	owledge a cal thinkin iar situatic Critical use d skills recu and logica and preso ons. kills require logical thi entational s to draw ap ired for att d analytica organizati is to draw a lis to draw a is d raw i lis require show very e or ineff	and skills required for g, with evidence of c ons. Apply highly eff e of data and results uired for attaining and al thinking, and ability entational skills. Apply ed for attaining monking, and ability to skills. Apply moderai opropriate conclusion aining some of the c al and critical abilities onal and presentati appropriate conclusion d for attaining the c little or no ability to	or attrigin: ectiv s to c t lease ty to oly ef st of appl ely e ns. sours es. S cours es. S cours apply	aining all the course al thought, and abilit e organizational and traw appropriate and st most of the course apply knowledge to fective lab skills and the course learning y knowledge to mos ffective lab skills and e learning outcomes how limited ability to
Course Grade Grade Descriptors	A+ to F A B C D Fail	Dents an lear to a pres insig Den lear fam tech Den outt fam tech Den outt fam tech Den outt fam tech Sho app effe fer Lac prot sho app effe sho app est sho app app sho app sho app app app a app app app app app app	nd labora emonstrate t arning outco apply know esentational sightful conc emonstrate s arning outco miliar and sc chniques. Co emonstrate g toomes. Shi miliar situatio chniques. Mo emonstrate p now evidence ply knowled ective lab sh emonstrate l ck of analyt oblems. Org o skills and t , L. E. Ba	tory work thorough ma mes. Show i ledge to a v skills. Apply lusions. substantial c omes. Show ome unfamil orrect use of general but ow evidence ons. Apply n ostly correct partial but lin e of some of get to solve cal and criti janization ar echniques. I	n (50% (50% w astery at strong an wide rang ly highly e command v evidence illar situati of data of r t incomplete e of some moderatel t but some mited com coherent e problem: thniques. L evidence of tical abiliti and preser Misuse of D. Jaqu	an advance alytical ana ge of comp effective lal l of a broace e of analytical ge of comp effective lal l of a broace e of analytical ly effective e erroneou mmand of k and logica s. Apply lin Limited abi of commar iese, logical ntational sk f data and i ue: An In	ting), and ceed level of do critical ab olex, familia b skills and d range of k tical and cr y effective fraw approp and of know l and critica organizatic s use of da su seo fd ac nowledge a al thinking, I mited or ba lility to use d and of knowl and of knowl and of knowl and of knowl and of knowl and of knowl and coher kills are mir results and	extensive kn litties and logi r and unfamil techniques. ( nowledge and riate conclusic vledge and ski l abilities and nal and prese l abilities and nal and prese ta and results nd skills requ but with limite rely effective ata and results and results ind skills requ but with limite rely effective ata and results out with limite rely effective ata and results and results on thinking. S imally effectivo or unable to d	owledge a cal thinkin iiar situatic Critical use and logica and press ons. kills requir logical thi entational s intational s intational s is to draw a is to draw a is to draw a lls required how very e or ineff fraw appro- botical Sp	and skills required for ons. Apply highly eff e of data and results uired for attaining a al thinking, and abili entational skills. App ed for attaining mo nking, and ability to skills. Apply moderat opropriate conclusio aining some of the o al and critical abilitition onal and presentatia appropriate conclusion d for attaining the c little or no ability to sective. Apply minima priate conclusions.	or attri rigina: ectiv s to c t leas ty to oly ef ely e appl ely e appl ely e s. sours s. sonal oons. ourse apply elly e	aining all the course al thought, and abilit e organizational and traw appropriate and st most of the course apply knowledge to fective lab skills and the course learning y knowledge to mos ffective lab skills and e learning outcomes how limited ability to skills. Apply partially e learning outcomes y knowledge to solv
Course Grade	A+ to F A B C D Fail J. Garcia S	Dents an Derrico a presinsion Dent fam tech Dent outo fam tech Dent Shot appo effe Dent Lac prot lab	nd labora amonstrate t arning outco apply know esentational sightful conce amonstrate g arning outco miliar and so chniques. Co amonstrate g toomes. Sho emonstrate p now evidence ply knowled ective lab sk amonstrate I ick of analyt oblems. Org o skills and t , L. E. Ba 2005) and	tory work thorough ma mes. Show ledge to a v skills. Apply lusions. substantial c mes. Show ome unfamil prrect use of general but ow evidence ons. Apply n ostly correct bartial but lin e of some of kills and tech kills and tech little or no e ical and criti ganization ar echniques. I	astery at strong an wide rang ly highly e command v evidence illar situati of data of r t incomple e of some moderatel t but some mited com coherent e problems thinques. L evidence of tical abiliti ind preser Misuse of D. Jaque Notes p	an advance alytical ana ge of competifications. Apply results to dri e of analytical ge of competifications. Apply results to dri ete command e analytical ly effective ete command e analytical ly effective e erroneou mmand of k and logica s. Apply lin Limited abi of commar ies, logical ntational sk f data and i ue: An In prepared	ced level of d critical ab plex, familia b skills and dr tical and cry effective raw approp and of know l and critica organizatic us use of da xnowledge a al thinking, l mility to use d and of know l and coherr kills are mir results and nd of know and of know and coherr kills are mir results and troductio d by cours	extensive kn litties and logi r and unfamil techniques. ( nowledge and riate conclusic vledge and ski l abilities and results nd skills requi put with limite rely effective ata and results edge and skills requiped fective or unable to d n to the Op e coordinal	owledge a cal thinkin iiar situatic Critical use and logica and press ons. kills requir logical thi entational s intational s intational s is to draw a is to draw a is to draw a lls required how very e or ineff fraw appro- botical Sp	and skills required for ons. Apply highly eff e of data and results uired for attaining a al thinking, and abili entational skills. App ed for attaining mo nking, and ability to skills. Apply moderat opropriate conclusio aining some of the o al and critical abilitition onal and presentatia appropriate conclusion d for attaining the c little or no ability to sective. Apply minima priate conclusions.	or attri rigina: ectiv s to c t leas ty to oly ef ely e appl ely e appl ely e s. sours s. sonal oons. ourse apply elly e	aining all the course al thought, and abilit e organizational and fraw appropriate and st most of the course apply knowledge to fective lab skills and the course learning y knowledge to mos ffective lab skills and e learning outcomes how limited ability to skills. Apply partially a learning outcomes y knowledge to solve ffective or ineffective

PHYS2235 Physics	of nanomat	erials (6 credits)		Academic Year	2012		
Offering Department	Physics			Quota			
Course Co-ordinator	Dr S J Xu,	Dr S J Xu, Physics					
Course Aim	concepts a	This course is designed to let senior undergraduate students and fresh postgraduate students know fundamental concepts and physical properties of nanomaterials including two-dimensional quantum wells, one-dimensional quantum wires and zero-dimensional quantum dots.					
Course Contents	nanomater Physical pr nanocrysta	als. Optical and transport pro operties of carbon nanotube s. Fundamental principles of	antum size effect. Dimensiona operties of quantum wells, superl s and semiconductor nanowires. scanning tunneling microscopy talorganic chemical vapor depos	attices and two-dimen Physical properties of and advanced thin-film	sional electron gas quantum dots and		
Learning Outcomes	<ul> <li>recall bas</li> <li>identify a electron ga</li> <li>recognise</li> <li>such as mo</li> <li>describe to</li> </ul>	nd compare optical and tra the fundamental principles o ecular beam epitaxy and me basic physics of carbon na	students should be able to: f dimensionality, density of states insport properties of quantum v f scanning tunneling microscopy talorganic chemical vapor depos anotubes and semiconductor nan ensional quantum dots and nano	wells, superlattices an and advanced thin-film ition nowires			
Pre-requisites		/S2323; and /S2221, or already enrolled	n this course.				
Offer in 2012 - 2013	Not offered			Examination	To be confirmed		
Offer in 2013 - 2014	N						
Teaching Hours	36 hours of	lectures and tutorials					
Assessment Method		written examination (60% s (40% weighting)	weighting), and continuous ass	sessment including te	sts and homework		
Course Grade	A+ to F						
Grade Descriptors	A	learning outcomes. Show strong a	an advanced level of extensive knowle nalytical and critical abilities and logical th ge of complex, familiar and unfamiliar s	ninking, with evidence of orig	inal thought, and ability		
	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.						
	С	outcomes. Show evidence of som	ete command of knowledge and skills e analytical and critical abilities and logic ly effective organizational and presentation	cal thinking, and ability to ap	of the course learning oply knowledge to most		
	D	for attaining some of the cou alytical and critical abilities. zational and presentational s	Show limited ability to				
	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.						
Textbooks	Lecture No	es prepared by the course co	oordinator				
References	Pub, 1998)		Nanomaterials: synthesis, proper	ties and applications	Institute of Physics		
	G. Cao: Na	nostructures and Nanomater	ials (Imperial College Press, 2004	4).			

PHYS2321 Introduct	ory electromagnetism (6 credits)	Academic Year	2012
Offering Department	Physics	Quota	
Course Co-ordinator	Dr X D Cui, Physics		
Course Aim	To provide those students who major in Physics with a prelimit physical concepts required for an understanding of electricity and		ic and magnetisr
Course Contents	The course introduces electric fields and potential, methods magnetostatics and electromagnetic induction. Magnetic propertie		
Learning Outcomes	On successful completion of the course, students should be able - identify the fundamental physics in electrostatics and magnetism - apply mathematical tools to describe electrostatics and magnetis - use the Maxwell's equations to explain various electrostatic and - differentiate between electrostatics in vacuum and in dielectric ma - differentiate between magnetism in vacuum and in magnetic ma - apply essential skills of making measurements with appropriate - interpret the experimental data and compare with the prediction	n sm. magnetic phenomena naterials tterials instruments in physics experim	
Pre-requisites	Pass in PHYS1414 and PHYS1415 and PHYS2627		
Offer in 2012 - 2013	2nd sem	Examination	May
Offer in 2013 - 2014	Y		

Teaching Hours	36 hours of lectures and tutorials; 9 hours of laboratory work				
Assessment Method	One 3-hour written examination (60% weighting), and continuous assessment including tests, homework assignments and laboratory work (40% weighting)				
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.				
	C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills. Apply moderately effective lab skills and techniques. Mostly correct but some erroneous use of data and results to draw appropriate conclusions.				
	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills. Apply partially effective lab skills and techniques. Limited ability to use data and results to draw appropriate conclusions.				
	Fail 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.				
Textbooks	D. J. Griffiths: Introduction to Electromagnetism (Prentice-Hall, 3rd ed.)				
References	I. S. Grant & W.R. Philips: Electromagnetism (John Wiley, 1975) J. R. Reitz, F. J. Milford, & R. W. Christy: Foundations of Electromagnetic Theory (Addison-Wesley, 1992) P. Lorrain & D. R. Corson: Electromagnetic Fields and Waves (John Wiley, 1991)				
Course Website	http://www.physics.hku.hk/~phys2321/				

PHYS2322 Statistica	HYS2322 Statistical mechanics and thermodynamics (6 credits)				2012		
Offering Department	Physics	Physics					
Course Co-ordinator	Prof S Fur	Prof S Fung, Physics					
Course Aim		tion to Statistical Mechanics and elementary Therm- his course is taught as a basic and essential subject			ed phenomena in		
Course Contents	entropy; co	Fermi and Bose-Einstein statistics. First, second a ncept of temperature; the free energy. Density of st ion. Heat capacities. Thermal properties of magneti	ates. Classica				
Learning Outcomes	<ul> <li>demonstri</li> <li>state the</li> <li>explain a</li> <li>describe</li> <li>describe</li> <li>apply ess</li> </ul>	On successful completion of the course, students should be able to: - demonstrate knowledge and discuss the basic concept of thermodynamics and statistical mechanics - state the three laws of Thermodynamics - explain and describe the relationship between heat and work - describe the features and examples of Maxwell-Boltzmann, Bose-Einstein and Fermi-Dirac statistics - describe the relationship between entropy and disorder - apply essential skills of making measurements in Physics experiments with appropriate instruments - interpret the experimental data and compare with predictions from underlying physical principles					
Pre-requisites	Pass in PH	YS1414 and PHYS1415 and PHYS2627					
Offer in 2012 - 2013	2nd sem			Examination	Мау		
Offer in 2013 - 2014	Y						
Teaching Hours	36 hours o	lectures and tutorials; 8 hours of laboratory work					
Assessment Method		r written examination (60% weighting), course work and laboratory work (10% weighting)	including test	ts and homework a	ssignments (30%		
Course Grade	A+ to F						
Grade Descriptors	A	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining a learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original though to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organi presentational skills. Apply highly effective lab skills and techniques. Critical use of data and results to draw app insightful conclusions.					
	в	Demonstrate substantial command of a broad range of knowled learning outcomes. Show evidence of analytical and critical al familiar and some unfamiliar situations. Apply effective organiz techniques. Correct use of data of results to draw appropriate co	bilities and logical ational and prese	I thinking, and ability to	apply knowledge to		
	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 a Lack of analytical and critical abilities, logical and coherent thin problems. Organization and presentational skills are minimally lab skills and techniques. Misuse of data and results and/or unal	king. Show very effective or ineffe	little or no ability to apply active. Apply minimally e	/ knowledge to solve		

Textbooks	F. Mandl: Statistical Physics (John Wiley, 1988, 2nd ed.).
References	C. Kittel: Elementary Statistical Physics (Robert E. Krieger, 1988).
Course Website	http://www.physics.hku.hk/~phys2322/

PHYS2323 Introduct		(/					
Offering Department	Physics			Quota			
Course Co-ordinator	Dr W Yao,	Dr W Yao, Physics					
Course Aim		aims at a rigorous introduction to the condisite for several advanced physics courses.		n-relativistic quantu	um mechanics. I		
Course Contents	current and principle; t transmission wavepacket and eigen hydrogen	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; identical particles; Pauli exclusion principle; fermion and bosons; non					
Learning Outcomes	<ul> <li>describe uncertainty</li> <li>formulate</li> <li>formulate</li> <li>formulate</li> <li>gouge the certain per</li> <li>recognise</li> <li>several adr</li> <li>apply ess</li> </ul>	<ul> <li>degenerate perturbation theory.</li> <li>On successful completion of the course, students should be able to: <ul> <li>describe the statistical interpretation of quantum mechanical systems, and calculate expectation values and uncertainty of physical observables</li> <li>formulate energy eigenvalue problems, and solve them in examples where potentials have simple analytical forms</li> <li>formulate time evolution of the wavefunction and the expectation value of physical observables with known energy eigenfunctions</li> <li>judge the applicability of time-independent perturbation theory and formulate leading order energy corrections in certain perturbations applied to the physical system</li> <li>recognise concepts such as angular momentum, spin, fermion and bosons, which will be further elaborated in several advanced physics courses</li> <li>apply essential skills of making measurements with appropriate instruments in physics experiments</li> <li>interpret the experimental data and compare with the prediction of underlying physical principle</li> </ul> </li> </ul>					
Pre-requisites	Pass in PH	YS2627					
Offer in 2012 - 2013	1st sem			Examination	Dec		
Offer in 2013 - 2014	Y						
Teaching Hours	36 hours o	lectures and tutorials; 9 hours of laboratory	work				
Assessment Method		r written examination (60% weighting), s and laboratory work (40% weighting)	and continuous assess	ment including te	ests, homework		
Course Grade	A+ to F						
Grade Descriptors	A	Demonstrate thorough mastery at an advanced lew learning outcomes. Show strong analytical and critics to apply knowledge to a wide range of complex, fa presentational skills. Apply highly effective lab skills insightful conclusions.	al abilities and logical thinking, v miliar and unfamiliar situations	with evidence of origina . Apply highly effective	I thought, and ability organizational and		
	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills. Apply effective lab skills and techniques. Correct use of data of results to draw appropriate conclusions.						
	С	for attaining most of ting, and ability to apply ls. Apply moderately efforting opriate conclusions.	knowledge to most				
	D	Show evidence of some coherent and logical thinki apply knowledge to solve problems. Apply limited of	imited command of knowledge and skills required for attaining some of the course learning outcomes. coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to e problems. Apply limited or barely effective organizational and presentational skills. Apply partially chniques. 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 cr Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to problems. Organization and presentational skills are minimally effective or ineffective. Apply minima lab skills and techniques. Misuse of data and results and/or unable to draw appropriate conclusions.					knowledge to solve		
Textbooks	D. J. Griffit	s: Introduction to Quantum Mechanics (Pea	arson Education, 2005)				
References		<ul> <li>D. J. Griffiths: Introduction to Quantum Mechanics (Pearson Education, 2005)</li> <li>R. L. Liboff: Introductory Quantum Mechanics (Addison-Wesley, 2003, 4th ed.)</li> <li>N. Zettili: Quantum Mechanics, Concepts and Applications (John Wiley &amp; Sons, 2001)</li> </ul>					
		vicz: Quantum Physics (John Wiley & Sons,		2001)			

PHYS2325 Theoretic	cal physics (6 credits)	Academic Year	2012			
Offering Department	Physics Quota 50					
Course Co-ordinator	Prof Z D Wang, Physics					
Course Aim	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	This course will introduce and discuss the following topics: Application of complex variables including the Cauchy's					

	equation, t	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.), and Fourier Series.				
Learning Outcomes	<ul> <li>analyse a</li> <li>calculate</li> <li>analyse</li> <li>governing</li> <li>apply the</li> </ul>	On successful completion of the course, students should be able to: - analyse and examine the analytical properties of complex functions that commonly appear in physical problems. - calculate various definite integrals using the method of residues in seeking the solution of physical problems - analyse and solve the first and second order ordinary equations, and typical partial differential equations governing the dynamics of physical systems - apply the special functions in handling various physical problems - use the Fourier Series in describing any periodic function in the study of various physical phenomena				
Pre-requisites		IYS1414 or PHYS1415 or PHYS2627; and HYS1315 and PHYS1316) or (MATH1804 and MAT	H1805) or (MATH1111 and MATH	1211)		
Offer in 2012 - 2013	1st sem		Examination	Dec		
Offer in 2013 - 2014	Y					
Teaching Hours	36 hours o	f lectures and tutorials				
Assessment Method		r written examination (80% weighting), and cont ts (20% weighting)	inuous assessment including tes	ts and homework		
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.				
	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.					
Textbooks	G. Arfken a	and H. Weber: Mathematical Methods for Physicists	(Academic Press, 2005)			
References	E. Butkov:	Mathematical Physics (Addison-Wesley, 1973)				
Course Website	http://www	.physics.hku.hk/~phys2325/				

Offering Department	Dhusion	Quota				
Offering Department	Physics	Quota				
Course Co-ordinator	Dr H F Chau, Physics					
Course Aim	This course is designed for highly selective second year students who a in physics. It provides students with the opportunity to study a physics p experimental, under the supervision by an academic staff. The available and are designed for prospective research students.	roblem by themselves,	either theoretical			
Course Contents	Students interested in taking this course should contact their prospec contents and the nature of their projects in the coming academic year. T coordinator based on their GPA, and suitable arrangement with individua Theoretical projects: The student will receive training in research lite investigation which is close to research work in nature, under the superv need to perform some original calculations; to fill in mathematical gap combination of both. In some cases, it may be necessary to use compute Experimental projects: The student will carry out experiments in resear staff member. The student will receive training in advanced experime samples, determination of physical properties, measurement of smal vacuum and low-temperature techniques etc. Wide reading of the relevan	hey must get the appro I supervisor to take this rature reading and rev rision of a staff member s of some sophisticate ers. ch laboratories under the ntal techniques, includ I signals obscured by	val from the cours course. riewing, and mak r. The student ma d derivations, or ne supervision of ling preparation of noise, laser, hic			
Learning Outcomes	On successful completion of the course, students should be able to: - execute a theoretical or experimental research project on a special topi - review the knowledge of a physics problem through literature review of - describe and explain connections between physical principles and the s - (for theoretical projects) identify the key issues of the problem and solv compare the results with predictions or existing solutions - (for experimental projects) execute physics experiments, analyze resul in comparison with predictions	books and research jou tudy problem. ve some or all of them	independently, ar			
Pre-requisites	Pass in one of these courses: PHYS0001, PHYS0002, PHYS000 PHYS1414, PHYS1415, PHYS1417	3, PHYS1303, PHYS <sup>-</sup>	1315, PHYS1316			
Offer in 2012 - 2013	Year long	Examination	No Exam			
Offer in 2013 - 2014	Y					
Teaching Hours	Small group instruction up to 2 scheduled hours per week over two semesters. Students will be assigned a supervisor who will provide individual instruction on a particular physics project.					

	and an oral presentation.	
Course Grade	A+ to F	
Grade Descriptors	A Demonstrate thorough grasp of the subject. Show strong analytical and critical abilit original thought. Insightful use and critical analysis / evaluation of information drawn and to quote/reference aptly. Critical use of data and results to draw appropriate effective organizational and presentational skills. Work of A+ should show considerab in wider areas relevant to the topic.	n from a full range of high quality sources and insightful conclusions. Apply highly
	B Demonstrate substantial grasp of the subject. Evidence of analytical and critical ab relevant information from sources, showing ability to make meaningful compinterpretations and to quote/reference aptly. Correct use of data of results to draw organizational and presentational skills.	parisons between different secondary
	C Demonstrate general but incomplete grasp of the subject. Evidence of some analytica Use of relevant information from sources, showing ability to make comparisons quote/reference aptly. Mostly correct but some erroneous use of data and results moderately effective organizational and presentational skills.	between different interpretations and to
	Demonstrate partial but limited grasp, with retention of some relevant information, of and logical thinking, but with limited analytical and critical abilities. Demonstrate us mainly through summary rather than analysis and comparison. Limited ability to u conclusions. Apply limited or barely effective organizational and presentational skills.	se and reference of several sources, but
	Fail Demonstrate evidence of little or no grasp of the knowledge and understanding of analytical and critical abilities, logical and coherent thinking. Limited use of seconda them. Misuse of data and results and/or unable to draw appropriate conclusions. C minimally effective or ineffective.	ary sources and no critical comparison of
Course Website	http://www.physics.hku.hk/~phys2533/	

	-	cal mechanics (6 credits)	Academic Year	2012		
Offering Department	Physics		Quota			
Course Co-ordinator	Dr F C C L	ing, Physics				
Course Aim		This course aims at providing students a solid foundation in classical Newtonian mechanics with rigorous mathematical treatments. Students are expected to have good working knowledge of calculus and vectors.				
Course Contents	conservativ normal mo	Newton's law of motion, inertia and non-inertia frames of reference, linear momentum and its conservation, conservative force field and mechanical energy conservation, simple harmonic oscillation, coupled oscillation and normal mode, angular momentum and its conservation, system of particles, motion of rigid body, central force field, nertia tensor, principal axes, Euler Equation.				
Learning Outcomes	<ul> <li>define the</li> <li>demonstriphic recall the</li> <li>recognise</li> <li>recall the</li> <li>state the</li> <li>recognise</li> <li>apply ess</li> </ul>	In successful completion of the course, students should be able to: define the logical framework of Newtonian Mechanics and recognise the validity of Newtonian Mechanics demonstrate transformations between inertia and non-inertia frames. recall the principles for Newtonian Mechanics for single particle and solve the corresponding problems. recognise simple harmonic oscillations with damping and driving force, and calculate the normal modes fo pupled oscillators. recall the concepts of many-particle system and rigid body motion, and solve the corresponding problem. state the physics of central force field problem, with gravitational force field as an illustrating example. recognise the angular momentum theory and solve the corresponding problems. apply essential skills of making measurements with appropriate instruments in physics experiments interpret the experimental data and compare with the prediction of underlying physical principle				
Pre-requisites	Pass in PH	IYS1413 or PHYS1417 or PHYS1414				
Offer in 2012 - 2013	1st sem		Examination	Dec		
Offer in 2013 - 2014	Y					
Teaching Hours	36 hours o	f lectures; 6-8 hours of tutorials/example classes; and 9 hours of I	aboratory work			
Assessment Method		ur written examination (50% weighting), and continuous ass its and laboratory work (50% weighting)	sessment including	tests, homewor		
Course Grade	A+ to F					
Grade Descriptors	A	Demonstrate thorough mastery at an advanced level of extensive knowledge learning outcomes. Show strong analytical and critical abilities and logical think to apply knowledge to a wide range of complex, familiar and unfamiliar situa presentational skills. Apply highly effective lab skills and techniques. Critical u insightful conclusions.	ing, with evidence of origin tions. Apply highly effective	al thought, and abili ve organizational ar		
	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 requestion outcomes. Show evidence of some analytical and critical abilities and logical tramiliar situations. Apply moderately effective organizational and presentationa techniques. Mostly correct but some erroneous use of data and results to draw	hinking, and ability to app I skills. Apply moderately e	ly knowledge to mo		
	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.					
		effective lab skills and techniques. Limited ability to use data and results to draw	w appropriate conclusions.			
	Fail	effective lab skills and techniques. Limited ability to use data and results to drav Demonstrate little or no evidence of command of knowledge and skills requir Lack of analytical and critical abilities, logical and coherent thinking. Show ver problems. Organization and presentational skills are minimally effective or ine lab skills and techniques. Misuse of data and results and/or unable to draw app	red for attaining the cours y little or no ability to appl ffective. Apply minimally e	e learning outcome ly knowledge to solv		

References	A. Arya: Introduction to Classical Mechanics (Prentice Hall, 1998)
Course Website	http://www.physics.hku.hk/~phys2626/

PHYS2627 Introduct	ory quant	ntum	physics (6 crec	dits)		Academic Year	2012
Offering Department	Physics	hysics Quota				Quota	
Course Co-ordinator	Dr F C C l	CLing,	Physics				
Course Aim	study of p	his course is designed to provide students with a comprehensive introduction to the concepts and ideas related to udy of physics in the microscopic scale-which revolutionize our understanding of the properties of light and latter in the universe.					
Course Contents		the He	eisenberg uncertaii		applications of quantum lependent Schrodinger		
Learning Outcomes	<ul> <li>recognize</li> <li>recognize</li> <li>recall tir</li> <li>potential s</li> <li>recognise</li> <li>apply esserted</li> </ul>	successful completion of the course, students should be able to: cognize the limitation of classical physics cognize the duality nature of matter and wave, and the uncertainty principle ceall time-independent Schrodinger equation, and use it to solve the problems for simple potential wells, ential steps and tunneling cognise quantum structure of hydrogen and many electron system ply essential skills of making measurements with appropriate instruments in physics experiments terpret the experimental data and compare with the prediction of underlying physical principle					
Pre-requisites				7 or PHYS1414 or PH dy passed in PHYS13	'		
Offer in 2012 - 2013	2nd sem	ı				Examination	Мау
Offer in 2013 - 2014	N						
Teaching Hours	36 hours o	s of lec	ctures and tutorials	s; 9 hours of laborator	y work		
Assessment Method				on (50% weighting), ks (50% weighting)	and continuous asse	essment including	tests, homework
Course Grade	A+ to F						
Grade Descriptors	A	lea to pre	arning outcomes. Šhow apply knowledge to a	v strong analytical and critic wide range of complex, fa	vel of extensive knowledge a cal abilities and logical thinkin amiliar and unfamiliar situatio s and techniques. Critical use	g, with evidence of origin ons. Apply highly effection	nal thought, and ability ve organizational and
	В	Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills. Apply effective lab skills and techniques. Correct use of data of results to draw appropriate conclusions.					
	с	out fan	tcomes. Show evidence miliar situations. Apply	ce of some analytical and o moderately effective organ	knowledge and skills requir critical abilities and logical thi nizational and presentational s of data and results to draw ap	inking, and ability to app skills. Apply moderately	ly knowledge to most
	D	Sh ap	now evidence of some oply knowledge to solve	e coherent and logical think re problems. Apply limited	dge and skills required for att king, but with limited analytic or barely effective organizati use data and results to draw	al and critical abilities. S ional and presentational	Show limited ability to skills. Apply partially
	Fail	La	ack of analytical and cri oblems. Organization a	itical abilities, logical and c and presentational skills ar	knowledge and skills require coherent thinking. Show very re minimally effective or ineffe s and/or unable to draw appro	little or no ability to app ective. Apply minimally	ly knowledge to solve
Textbooks	R. Harris:	s: Mod	lern Physics (Addis	son-Wesley, 2008, 2n	d ed.)		
	K Krane	K. Krane: Modern Physics (Wiley, 1996) R. Eisberg and R. Resnick: Quantum Physics of Atoms, Molecules, Solids, Nuclei, and Particles (Wiley, 1985) R. A. Serway, C. J. Moses and C. A. Moyer: Modern Physics (Thomson, 2005, 3rd ed.) P. T. Tipler and R. A. Llewellyn: Modern Physics (W. H. Freeman, 1999)					
References	R. Eisberg R. A. Serv	erg and rway, (	d R. Resnick: Quar C. J. Moses and C	ntum Physics of Atom C. A. Moyer: Modern F	Physics (Thomson, 2005		(Wiley, 1985)

PHYS2628 Atomic a	nd nuclear physics (6 credits)	Academic Year	2012	
Offering Department	Physics	Quota		
Course Co-ordinator	Dr S Zhang, Physics			
Course Aim	This course will introduce students to the fundamentals of atomic physics ar to provide a coherent and concise coverage of traditional atomic and nucle research interest will be also discussed, such as laser cooling and trappin realization of Bose-Einstein condensate in atomic vapors.	ar physics. Importan	t topics of current	
Course Contents	Topics include: Atomic structure of hydrogen and hydrogen-like atom, multi- field, spectroscopy, laser trapping and cooling; nuclear structure, shell mode the basic principles of atomic and nuclear physics will be mentioned when a	and nuclear reaction		
Learning Outcomes	On successful completion of the course, students should be able to: 1. Apply general considerations of quantum physics to atomic and nucl magnitude of estimation of physical effects	ear system; make ç	eneral orders of	

	3. Recogr	how light interacting with atom; the working principle of laser tra- nize the general features of atomic/nuclear spectroscopy uantum physics to understand the basic features of simple nucl		et al.
Pre-requisites	Pass in P	HYS2627 Introductory quantum physics		
Offer in 2012 - 2013	2nd sem		Examination	Мау
Offer in 2013 - 2014	Y			
Teaching Hours	36 hours of	of lectures and 18 hours of tutorials		
Assessment Method		ur written examination (50% weighting), continuous assessm	ent including tests (30	% weighting) and
Course Grade	A+ to F			
Grade Descriptors	A	Demonstrate thorough mastery at an advanced level of extensive knowled learning outcomes. Show strong analytical and critical abilities and logical th to apply knowledge to a wide range of complex, familiar and unfamiliar si presentational skills. Apply highly effective lab skills and techniques. Critical insightful conclusions.	inking, with evidence of origin tuations. Apply highly effection	hal thought, and ability ve organizational and
	в	Demonstrate substantial command of a broad range of knowledge and skil learning outcomes. Show evidence of analytical and critical abilities and familiar and some unfamiliar situations. Apply effective organizational and techniques. Correct use of data of results to draw appropriate conclusions.	ogical thinking, and ability to	apply knowledge to
	С	Demonstrate general but incomplete command of knowledge and skills r outcomes. Show evidence of some analytical and critical abilities and logic familiar situations. Apply moderately effective organizational and presentation techniques. Mostly correct but some erroneous use of data and results to dr	al thinking, and ability to app onal skills. Apply moderately	ly knowledge to most
	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 re- Lack of analytical and critical abilities, logical and coherent thinking. Show problems. Organization and presentational skills are minimally effective or lab skills and techniques. Misuse of data and results and/or unable to draw a	very little or no ability to app ineffective. Apply minimally	ly knowledge to solve
Textbooks	W. Demtr	otes provided by Course Coordinator oder, Atoms, molecules and photons (Springer, 2nd, 2011) Introductory nuclear physics (John Wiley & Sons, 1988)		

PHYS3033 General	relativity (6	6 credits)				Academic Year	2012
Offering Department	Physics				Quota		
Course Co-ordinator	Dr T C Ha	arko, Physics					
Course Aim				ral relativity. To pr ations of the theory		al skills and analytic	al tools necessary
Course Contents	covariant of	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.					
Learning Outcomes	<ul> <li>apply the astrophysic</li> <li>explain the from a gent</li> <li>demonst</li> </ul>	In successful completion of the course, students should be able to: apply the mathematical and physical ideas of the theory of general relativity for the study of various systems i strophysics and cosmology explain the observational effects at the scale of the Solar System that cannot be described by Newtonian gravit om a general relativistic point of view demonstrate knowledge and discuss the dynamic interactive physical processes in astrophysics by using a eneral relativistic approach					
Pre-requisites	Pass in PH	HYS1303 and	PHYS2321 and P	HYS2322 and PHY	YS2323		
Offer in 2012 - 2013	Not offered	d				Examination	To be confirmed
Offer in 2013 - 2014	Y						
Teaching Hours	36 hours o	of lectures and	I tutorials				
Assessment Method		ur written exa nts (50% weig		veighting), and cor	ntinuous assess	sment including tes	ts and homework
Course Grade	A+ to F						
Grade Descriptors	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required fo learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of or to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effer presentational skills.				ng, with evidence of origi	nal thought, and ability	
	В	learning outco	mes. Show evidence		al abilities and logic	equired for attaining at leacal thinking, and ability tentational 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	Show evidence	e of some coherent a	nd logical thinking, but	with limited analyti	ttaining some of the cour cal and critical abilities. nal and presentational sk	Show limited ability to
	Fail	Lack of analyt	Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes.				

Textbooks	Lecture notes provided by course instructor.
References	R. d'Inverno: Introducing Einstein's Relativity (Clarendon Press, Oxford, 1992) J. L. Martins: General Relativity: A First Course for Physicists (Prentice Hall, London, New York, 1996) M. Ludvigsen: General Relativity: A Geometric Approach (Cambridge University Press, Cambridge, New York, 1999)
Course Website	http://www.physics.hku.hk/academic/courses/phys3033/index.html

PHYS3034 Cosmolo	gy (6 credi	its)		Academic Yea	r 2012	
Offering Department	Physics			Quota		
Course Co-ordinator	Dr T C Hai	Dr T C Harko, Physics				
Course Aim	mathemati	ical formulation	s to offer an advanced introduction used to model the evolution and dy theory and structure and galaxy for	namics of the universe, and to		
Course Contents	The metri nucleosynt	ne visible universe. Empirical basis for cosmological theories. ne metric of the universe. The big bang models. Thermodynamics of the early universe. Primordial icleosynthesis. The very early universe. Inflationary models. The cosmological constant problem. Structure and alaxy formation.				
Learning Outcomes	<ul> <li>apply phy</li> <li>explain the</li> <li>demonstr</li> </ul>	ysics principles t ne observed phe rate knowledge	of the course, students should be al o describe the observational/experi- enomena of cosmology and discuss the underlying physical e dynamic interactive processes that	nental aspects of cosmology concepts associated with the concepts	cosmological evolution	
Pre-requisites	Pass in PH	HYS2021 or PH	/S2039			
Offer in 2012 - 2013	Not offered	d		Examination	To be confirmed	
Offer in 2013 - 2014	Ν					
Teaching Hours	36 hours o	of lectures and tu	Itorials			
Assessment Method		ur written exam nts (50% weighti	ination (50% weighting), and cont ng)	inuous assessment including	tests and homework	
Course Grade	A+ to F					
Grade Descriptors	A	learning outcome	rough mastery at an advanced level of exte s. Show strong analytical and critical abilities ge to a wide range of complex, familiar an ills.	and logical thinking, with evidence of	original thought, and ability	
	В	Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.				
	С	outcomes. Show	neral but incomplete command of knowledge evidence of some analytical and critical ability. Apply moderately effective organizational a	ities and logical thinking, and ability to		
	D	Show evidence of	ial but limited command of knowledge and s of some coherent and logical thinking, but w to solve problems. Apply limited or barely eff	vith limited analytical and critical abiliti	es. Show limited ability to	
	Fail	Lack of analytica	or no evidence of command of knowledge l and critical abilities, logical and coherent th zation and presentational skills are minimally	ninking. Show very little or no ability to		
Textbooks	Lecture no	otes provided by	course instructor.			
References	M. Rowan-	-Robinson: Cosi	ogy: A First Course (Cambridge Uni nology (Clarendon Press, Oxford, 1 Cosmology: The Origin and Evolution	996)		
		Coles and F. Lucchin: Cosmology: The Origin and Evolution of Cosmic Structure (John Wiley, Chichester, 1995)				

PHYS3036 Interstell	ar medium (6 credits)	Academic Year	2012		
Offering Department	Physics	Quota			
Course Co-ordinator	Dr M H Lee, Physics				
Course Aim	Processes responsible for absorption and emission of continuu atmospheres and interstellar space, and their astrophysical appli		and dust in stellar		
Course Contents	Topics include: gas, dust, atoms, molecules, radiation; physical heavier elements; hydrogen clouds, molecular clouds; HII regions				
Learning Outcomes	On successful completion of the course, students should be able - express what exists between stars in spiral and elliptical galaxie - apply physical principles to describe excitation/ionization and de - recognize which process or processes occur or dominate in whi	es e-excitation/recombination of at			
Pre-requisites	Pass in PHYS2039 and PHYS2321 and PHYS2323				
Offer in 2012 - 2013	1st sem	Examination	Dec		
Offer in 2013 - 2014	Ν				

Teaching Hours	36 hours	36 hours of lectures and tutorials				
Assessment Method	One 2-ho	our written examination (50% weighting), and course work (50% weighting)				
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 knowledge and skills required for attaining some 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.				
Textbooks	S. Kwok:	Physics and Chemistry of the Interstellar Medium (University Sciences Book, 2007)				
References	TBC					

PHYS3037 Selected	topics in	astrophysics (6 credits)	Academic Year	2012		
Offering Department	Physics		Quota			
Course Co-ordinator	Prof K S (	rof K S Cheng, Physics				
Course Aim		o introduce students some current topics in astrophysics. It may be taken as a self-contained course or as inckground to research work in astrophysics.				
Course Contents	Properties stars and	rief review of thermodynamical equilibrium, radiation mechanisms and general relativity. Physics of shock wave. roperties of Cosmic rays. Physics of compact object stellar objects including black holes, white dwarfs, neutron ars and quark stars. Elements of cosmology: classical and relativistic dynamical theories, observational arameters.				
Learning Outcomes	<ul> <li>apply ph</li> <li>explain t</li> <li>demonstration</li> </ul>	ssful completion of the course, students should be able to: hysics principles to describe the physical properties of various as the observed phenomena of some selected astrophysical object trate knowledge and discuss the underlying physical concepts a dynamic interactive processes	s	ophysical system		
Pre-requisites	Pass in P	HYS2321 and PHYS2322 and PHYS2323				
Offer in 2012 - 2013	1st sem		Examination	Dec		
Offer in 2013 - 2014	Y		'			
Teaching Hours	36 hours	of lectures and tutorials				
Assessment Method		our written examination (50% weighting), and continuous a ents and presentations (50% weighting)	assessment including	tests, homework		
Course Grade	A+ to F					
Grade Descriptors	A	Demonstrate thorough mastery at an advanced level of extensive knowle learning outcomes. Show strong analytical and critical abilities and logical th to apply knowledge to a wide range of complex, familiar and unfamiliar s presentational skills.	inking, with evidence of origin	nal thought, and ability		
	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 outcomes. Show evidence of some analytical and critical abilities and logic familiar situations. Apply moderately effective organizational and presentation	al thinking, and ability to app			
	D	Demonstrate partial but limited command of knowledge and skills required Show evidence of some coherent and logical thinking, but with limited an apply knowledge to solve problems. Apply limited or barely effective organiz	alytical and critical abilities.	Show limited ability to		
	<b>–</b> 1	Demonstrate little or no evidence of command of knowledge and skills re Lack of analytical and critical abilities, logical and coherent thinking. Show				
	Fail	problems. Organization and presentational skills are minimally effective or in		ly knowledge to solve		
Textbooks				iy knowledge to solve		
Textbooks References	Lecture no S. L. Sha B. W. Car 2nd editio	problems. Organization and presentational skills are minimally effective or in otes provided by course coordinator piro and S. A. Teukolsky: Black Holes, White Dwarfs and Neutro rroll & D. A. Ostlie: An Introduction to Modern Astrophysics (Add	nefféctive. An Stars (John Wiley, 19 dison-Wesley Publishing	983)		

PHYS3038 Planetary	Academic Year	2012	
Offering Department	Physics	Quota	

Course Co-ordinator	Dr M H Le	e, Physics						
Course Aim		This course provides students with a modern understanding of the properties of our Solar System and planetary systems around other stars and of the physical, chemical, and geological processes that govern them.						
Course Contents		Terrestrial planets, giant planets, moons and minor bodies in our Solar System; planetary dynamics; energy transport; planetary atmospheres, surfaces, and interiors; planet formation; extrasolar planets.						
Learning Outcomes	- describe experimen - explain e	ssential elements of the processes governing the properties of pla ysical principles to construct models for some basic aspects of the	netary bodies	•				
Pre-requisites	Pass in PH	1YS2322 or PHYS2626						
Offer in 2012 - 2013	Not offered	d	Examination	To be confirmed				
Offer in 2013 - 2014	Y							
Teaching Hours	36 hours o	of lectures and tutorials						
Assessment Method	One 2-hou	r written examination (50% weighting), and course work (50% weighting)	ghting)					
Course Grade	A+ to F							
Grade Descriptors	A	Demonstrate thorough mastery at an advanced level of extensive knowledge learning outcomes. Show strong analytical and critical abilities and logical thinking to apply knowledge to a wide range of complex, familiar and unfamiliar situat presentational skills.	ng, with evidence of or	iginal thought, and ability				
	В	Demonstrate substantial command of a broad range of knowledge and skills re learning outcomes. Show evidence of analytical and critical abilities and logic familiar and some unfamiliar situations. Apply effective organizational and prese	al thinking, and ability					
	С	Demonstrate general but incomplete command of knowledge and skills requ outcomes. Show evidence of some analytical and critical abilities and logical th familiar situations. Apply moderately effective organizational and presentational	ninking, and ability to a					
	D	Demonstrate partial but limited command of knowledge and skills required for a Show evidence of some coherent and logical thinking, but with limited analytic apply knowledge to solve problems. Apply limited or barely effective organization	cal and critical abilities	s. Show limited ability to				
	Fail	Demonstrate little or no evidence of command of knowledge and skills require Lack of analytical and critical abilities, logical and coherent thinking. Show very problems. Organization and presentational skills are minimally effective or ineffe	/ little or no ability to a					
Textbooks	Lecture no	tes provided by course coordinator						
References		and J. J. Lissauer: Planetary Sciences (Cambridge University Pre e and I. Gilmour: An Introduction to the Solar System (Cambridge I		2004)				

PHYS3040 Stellar pl	hysics (6 cl	redits)									Academ	ic Year	2	2012
Offering Department	Physics Quota													
Course Co-ordinator	Prof K S Cheng, Physics													
Course Aim	treatment	This course introduces the basic theory of stellar structure and evolution. It follows a vigorous mathema treatment that stresses on the underlying physical processes. Knowledge in quantum mechanics and statis mechanics will be advantageous.												
Course Contents	processes and their permits, sp AGB stars	Definition of stars. The H-R diagram. Stellar structure equations. Polytropic model. Elementary stellar radia processes. Simple stellar nuclear processes. Saha equation. Stability of stars. Zero-age main sequence st and their evolution. The solar neutrino problem. Late stage evolution of stars. Supernova explosion. If ti permits, special topics selected from below will be briefly mentioned: star formation, brown dwarfs and plan- AGB stars and planetary nebulae, binary stars and their evolution, Cepheid variables and theory of ste pulsation, and introduction to helioseismology.								equence sta losion. If tim s and planet				
Learning Outcomes	- describe - analytica	what is stally calculated	and Saha e	classify c e proble quations	different ms rela s.	it types ated to t	of sta the str	rs ucture	and e				0	e use of stell
			search pap							se pre			010	olution of star
Pre-requisites	- assess se	elected re		ers in th	e field c	of stella	ar astro	ophysi						nution of star
•	- assess se	elected re	search pap	ers in th	e field c	of stella	ar astro	ophysi		se pre	Examina			Nution of star
Offer in 2012 - 2013	- assess se Pass in PH	elected re	search pap	ers in th	e field c	of stella	ar astro	ophysi						
Offer in 2012 - 2013 Offer in 2013 - 2014	- assess se Pass in PH 2nd sem Y	elected re	search pap	ers in the 21 or PH	e field c	of stella	ar astro	ophysi						
Offer in 2012 - 2013 Offer in 2013 - 2014 Teaching Hours	<ul> <li>- assess se</li> <li>Pass in PH</li> <li>2nd sem</li> <li>Y</li> <li>36 hours of</li> <li>One 2-hou</li> </ul>	elected re HYS2021 of lectures ur written	search pap or PHYS23 and tutoria	ers in the 21 or PH Is n (50% v	e field o HYS232 weightir	of stella 22 or Pl	ar astro HYS2:	ophysi 323	CS		Examina	ation	Ν	
Offer in 2012 - 2013 Offer in 2013 - 2014 Teaching Hours Assessment Method	<ul> <li>- assess se</li> <li>Pass in PH</li> <li>2nd sem</li> <li>Y</li> <li>36 hours of</li> <li>One 2-hou</li> </ul>	elected re HYS2021 of lectures ur written	search pap or PHYS23 and tutoria examination	ers in the 21 or PH Is n (50% v	e field o HYS232 weightir	of stella 22 or Pl	ar astro HYS2:	ophysi 323	CS		Examina	ation	Ν	Мау
Pre-requisites Offer in 2012 - 2013 Offer in 2013 - 2014 Teaching Hours Assessment Method Course Grade Grade Descriptors	<ul> <li>- assess se</li> <li>Pass in PH</li> <li>2nd sem</li> <li>Y</li> <li>36 hours of</li> <li>One 2-hou</li> <li>and homes</li> </ul>	belected re HYS2021 of lectures ur written work assi learning to apply	search pap or PHYS23 and tutoria examination nments (50 ate thorough utcomes. Sho	ers in the 21 or PH Is n (50% v 2% weig) mastery a ww strong a	e field c HYS232 weightir hting) at an adv: analytical	of stella 22 or Pl ing), an vanced le l and criti	ar astro HYS2: nd con	323 tinuou: extensiv	cs 5 asse e knowl	ssmen	Examina s such a	ation Is preser	ntatio ttainir nal th	Мау

	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.
	Fail	Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.
Textbooks	Prialnik, D.	: An introduction to the theory of stellar structure and evolution, 2nd ed., (CUP, 2010)
References		& Deeming, T.: Astrophysics I. Stars (Jones and Bartlett, 1984) han, T.: Theoretical astrophysics Volume 1 (CUP, 2000)
Course Website	http://www	physics.hku.hk/~phys3040/

PHYS3231 Compute	ational phy	nysics	ics (6	edits)	Academic Year	2012			
Offering Department	Physics	Physics Quota							
Course Co-ordinator	Prof J Wa	Prof J Wang, Physics							
Course Aim	physics protection physics protection theoretical a strong content of the strong content	The aim of the course is to show how the power of computers enables a computational approach to solvi obysics problems to be adopted, which is distinct from, and complimentary to, traditional experimental a heoretical approaches. The material covered will found useful in any project or problem solving work that conta a strong computational or data analysis element. The course is designed such that a significant fraction of t students' time is spent actually programming specific physical problems rather than learning abstract techniques							
Course Contents	Integration classical m Schroding Poisson's	The course will cover the following problems: Introductory Computational Physics and Computer Algebra, ntegration and Differentiation, Interpolation and Extrapolation, Ordinary differential equations such as those of classical mechanics, Partial differential equations (such as the Maxwell's equations, 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 and other simulation methods (such as the Metropolis algorithm and molecular dynamics), and several physics projects							
Learning Outcomes	<ul> <li>demonstr</li> <li>apply Mo</li> <li>problems</li> <li>employ a</li> <li>use appr</li> </ul>	istrate Monte s / appro propria	te knov te Carl propria priate n	etion of the course, students edge in essential methods ar method and other simulatio numerical method to interpo nerical method to solve the ent computer programs to so	nd techniques for nume n methods to solve de late and extrapolate d lifferential equations g	eterministic as well as pro ata collected from physic overning the dynamics in	bbabilistic physic s experiments physical system		
Pre-requisites	Pass in PH	PHYS	/S2321	nd PHYS2322 and PHYS23	323				
Offer in 2012 - 2013	2nd sem	ı				Examination	May		
Offer in 2013 - 2014	Y								
Teaching Hours	24 hours o	s of lec	lecture	12 hours of laboratory work	and tutorials				
Assessment Method				xamination (40% weighting) one course project (60% we		essment including home	vork assignment		
Course Grade	A+ to F								
Grade Descriptors	A	lea to pre	learning to apply presenta	te thorough mastery at an advanc ticomes. Show strong analytical an nowledge to a wide range of comp onal skills.	d critical abilities and logical lex, familiar and unfamiliar	thinking, with evidence of origi situations. Apply highly effect	nal thought, and abilitive organizational and		
	В	lea	learning	te substantial command of a broad utcomes. Show evidence of analyt d some unfamiliar situations. Apply	ical and critical abilities an	d logical thinking, and ability t	ast most of the cours o apply knowledge to		
	С	C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course le outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge familiar situations. Apply moderately effective organizational and presentational skills.							
	D	Sh	Show e	te partial but limited command of k ence of some coherent and logica vledge to solve problems. Apply lim	I thinking, but with limited a	analytical and critical abilities.	Show limited ability t		
	Fail	La	Lack of	te little or no evidence of commar alytical and critical abilities, logical Organization and presentational ski	and coherent thinking. Sho	w very little or no ability to app			
Textbooks	Lecture no	notes	es prov	ed by course coordinator					
References				Computational Methods in F and Nisao Nakanishi: Comp					
Course Website	http://www								

PHYS3331 Electroma	Academic Year	2012	
Offering Department	Physics	Quota	
Course Co-ordinator	Dr X D Cui, Physics		
Course Aim	To provide those students who major in Physics with a fundamental knowle comprehensive concepts of electrodynamics and required training for physics		and magnetism

Course Contents		The course introduces Maxwell's equations, conservation Laws in electrodynamics, electromagnetic waves, potentials and fields, radiation and special relativity.						
Learning Outcomes	<ul> <li>review a</li> <li>apply M</li> <li>evaluate</li> </ul>	nd discuss the fundamen xwell's equations to anal how special relativity is in	urse, students should be able tal physics in classical electroo yse complicated electrostatic a ncorporated in the study of ele electromagnetism using approp	lynamics and magnetic phenomena ctromagnetism	Jes			
Pre-requisites	Pass in F or MATH		2 and PHYS2323 and (PHYS2	2325 or MATH2401 or MAT	H2301 or MATH2403			
Offer in 2012 - 2013	1st sem			Examination	Dec			
Offer in 2013 - 2014	Y							
Teaching Hours	36 hours	f lectures and tutorials						
Assessment Method		ur written examination ( nts (30% weighting)	70% weighting), and continuc	ous assessments including	tests and homework			
Course Grade	A+ to F							
Grade Descriptors	A	learning outcomes. Show st	tery at an advanced level of extensiv rong analytical and critical abilities and de range of complex, familiar and un	l logical thinking, with evidence of a	priginal thought, and ability			
	в	learning outcomes. Show e	nmand of a broad range of knowledg vidence of analytical and critical abil situations. Apply effective organizatio	ities and logical thinking, and abil				
	С	outcomes. Show evidence of	complete command of knowledge and of some analytical and critical abilities derately effective organizational and p	and logical thinking, and ability to				
	D	Show evidence of some co	ed command of knowledge and skills herent and logical thinking, but with l oblems. Apply limited or barely effectiv	imited analytical and critical abiliti	es. Show limited ability to			
	Fail	Lack of analytical and critica	dence of command of knowledge and al abilities, logical and coherent thinkii presentational skills are minimally effe	ng. Show very little or no ability to				
Textbooks	D. J. Grif	ths: Introduction to Electr	omagnetism (Prentice-Hall, 19	99, 3rd ed.)				
References	J. R. Reit	, F. J. Milford, & R. W. C	amics (Wiley, 1998, 3rd ed) hristy: Foundations of Electron nagnetic Fields and Waves (Jo		/esley, 1992)			
Course Website	http://ww	.physics.hku.hk/~phys33	31/					

		echanics (6 credits) Academic Year 20						
Offering Department	Physics							
Course Co-ordinator	Prof F C Z	Zhang	, Physics					
Course Aim		troduces more advanced concepts of quantum mechanics. Together with PHYS2323, these will provide the b nowledge of quantum mechanics to an undergraduate student.						
Course Contents	perturbatio	ngular momentum. Precession of electrons in magnetic field. Time-independent, non-degenerate and degener erturbation theory. Time dependent perturbation theory. Scattering, cross section, partial waves and Bc oproximation. Variational method.						
Learning Outcomes	<ul> <li>review the</li> <li>apply phy</li> </ul>	the per hysics	turbation theory and s principles to describe	se, students should be ab some other approximation the physical properties of iss the underlying physica	methods on va various quantu	um systems		
Pre-requisites	Pass in PH	PHYS2	323 and (PHYS2325	or MATH2401 or MATH23	01 or MATH24	103 or MATH2405)		
Offer in 2012 - 2013	2nd sem					Examination	Мау	
Offer in 2013 - 2014	Y							
Teaching Hours	36 hours o	of lect	ures and tutorials					
Assessment Method			itten examination (50 0% weighting)	0% weighting), and contir	nuous assessi	ment including test	s and homewo	
Course Grade	A+ to F							
Grade Descriptors	A	lear to a	ning outcomes. Show stro	y at an advanced level of exter og analytical and critical abilities a range of complex, familiar and	and logical thinking	g, with evidence of origir	nal thought, and abil	
	В	lear	ning outcomes. Show evi	nand of a broad range of knowle dence of analytical and critical a tuations. Apply effective organiza	abilities and logica	al thinking, and ability to		
	С	outo	comes. Show evidence of	omplete command of knowledge some analytical and critical abilit rately effective organizational an	ies and logical thi	nking, and ability to app		
	D	Sho	w evidence of some cohe	I command of knowledge and sk rent and logical thinking, but wit lems. Apply limited or barely effe	th limited analytica	al and critical abilities. S	Show limited ability	

	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.
Textbooks	D. J. Griffith	ns: Introduction to Quantum Mechanics (Prentice Hall, 1995)
References	S. Gasiorov	vicz: Quantum Physics (John Wiley & Sons, 2003)
Course Website	http://www.	physics.hku.hk/~phys3332/

111 00000 01035100	I mechanio	cs (6 cred	ts)		A	cademic Year	2012
Offering Department	Physics	Physics Quota					
Course Co-ordinator	Prof S Q S	Shen, Physi	s				
Course Aim			e is to introduce gener experience in using m				
Course Contents	variationa	al principle;	Many particle syste eneralized coordinate connection to quantu	s. Simple application			
Learning Outcomes	<ul> <li>explain t</li> <li>solve the</li> <li>discuss</li> </ul>	the difference e mechanics the connect	tion of the course, stu e between Newtonian problems using Lagra on between classical i principle to real physi	mechanics and Analy angian formalism, a di mechanics and quant	ytic mechanics ifferent method		
Pre-requisites	Pass in P	HYS2626 a	nd (PHYS2325 or MAT	H2401 or MATH230	1 or MATH2403	or MATH2405)	
Offer in 2012 - 2013	2nd sem				E	xamination	Мау
Offer in 2013 - 2014	Y						
Teaching Hours	36 hours	of lectures a	nd tutorials.				
Assessment Method		our written e ents (30% we	xamination (70% wei ighting)	ghting), and continue	ous assessmer	nts including test	ts and homewor
Course Grade	A+ to F						
Grade Descriptors							
	A	learning ou	e thorough mastery at an comes. Show strong analyt owledge to a wide range o nal skills.	ical and critical abilities an	d logical thinking, w	ith evidence of origir	nal thought, and abilit
	A B	learning ou to apply kr presentation Demonstra learning ou	comes. Show strong analyt owledge to a wide range o	ical and critical abilities and f complex, familiar and ur a broad range of knowledg analytical and critical abi	d logical thinking, w nfamiliar situations. ge and skills require ilities and logical th	vith evidence of origin Apply highly effective ed for attaining at lea hinking, and ability to	nal thought, and abilit ve organizational and ast most of the course
		learning ou to apply kr presentation Demonstra learning ou familiar and Demonstra outcomes.	comes. Show strong analyt owledge to a wide range of hal skills. e substantial command of a tcomes. Show evidence of	ical and critical abilities and f complex, familiar and ur a broad range of knowledg analytical and critical abi Apply effective organizatic command of knowledge a alytical and critical abilities	d logical thinking, w nfamiliar situations. ge and skills require lities and logical th onal and presentation and skills required s and logical thinkin	vith evidence of origin Apply highly effective ad for attaining at lear inking, and ability to onal skills. for attaining most o rg, and ability to app	nal thought, and abilit ve organizational and ast most of the course o apply knowledge to f the course learning
	В	learning ou to apply kr presentatic Demonstra learning ou familiar and Demonstra outcomes. familiar situ Demonstra Show evid	comes. Show strong analyti owledge to a wide range of all skills. e substantial command of i tocomes. Show evidence of some unfamiliar situations. e general but incomplete Show evidence of some an	ical and critical abilities and f complex, familiar and ur a broad range of knowledg analytical and critical abi Apply effective organizatio command of knowledge a alytical and critical abilities fective organizational and µ nd of knowledge and skills logical thinking, but with	d logical thinking, w nfamiliar situations. ge and skills required lifties and logical th onal and presentation and skills required s and logical thinking presentational skills a required for attaini limited analytical a	vith evidence of origin Apply highly effectived of or attaining at lea- inking, and ability to onal skills. for attaining most or g, and ability to app s. ing some of the cours ind critical abilities. S	hal thought, and abilit ve organizational and ast most of the course o apply knowledge to f the course learning ly knowledge to mos se learning outcomes show limited ability to
	B C	learning ou to apply kr presentation Demonstra outcomes. familiar situ Demonstra Show evid apply know Demonstra Lack of an	comes. Show strong analyti owledge to a wide range of al skills. e substantial command of a comes. Show evidence of some unfamiliar situations. e general but incomplete Show evidence of some an ations. Apply moderately ef e partial but limited comma noce of some coherent and	ical and critical abilities and f complex, familiar and ur a broad range of knowledg analytical and critical abi Apply effective organizatio command of knowledge a alytical and critical abilities fective organizational and p nd of knowledge and skills logical thinking, but with ply limited or barely effecti oommand of knowledge an logical and coherent thinki	d logical thinking, w nfamiliar situations. ge and skills requirer lities and logical th onal and presentativ and skills required s and logical thinkir presentational skills required for attain limited analytical a ive organizational a nd skills required for ing. Show very little	vith evidence of origin Apply highly effective ad for attaining at leasinking, and ability to onal skills. for attaining most o ng, and ability to app s. ing some of the cours and critical abilities. S nd presentational ski or attaining the cours or no ability to app	hal thought, and abilitive organizational and ast most of the course o apply knowledge to f the course learning ly knowledge to most se learning outcomes show limited ability to lls.
Textbooks	B C D Fail	learning ou to apply kr presentatio Demonstra learning ou familiar and Demonstra outcomes. familiar situ Demonstra Show evid apply know Demonstra Lack of an problems.	comes. Show strong analyti owledge to a wide range of all skills. e substantial command of it comes. Show evidence of some unfamiliar situations. e general but incomplete Show evidence of some an ations. Apply moderately ef e partial but limited comma nce of some coherent and edge to solve problems. Ap e little or no evidence of c lytical and critical abilities,	ical and critical abilities and f complex, familiar and ur a broad range of knowledg analytical and critical abi Apply effective organizatio command of knowledge a alytical and critical abilities fective organizational and µ nd of knowledge and skills logical thinking, but with ply limited or barely effecti ommand of knowledge an logical and coherent thinki anal skills are minimally effe	d logical thinking, w nfamiliar situations. ge and skills required lifties and logical th onal and presentation and skills required s and logical thinkin presentational skills a frequired for attainin limited analytical a ive organizational a nd skills required fo ing. Show very little rective or ineffective	vith evidence of origin Apply highly effectived ad for attaining at lea- inking, and ability to onal skills. for attaining most or g, and ability to app s. ing some of the cours ind critical abilities. S and presentational ski or attaining the cours or no ability to app s.	hal thought, and abilitive organizational and ast most of the course o apply knowledge to f the course learning ly knowledge to most se learning outcomes show limited ability to lls.

PHYS3431 Experime	ental physics (6 credits)	Academic Year	2012			
Offering Department	Physics Quota 4					
Course Co-ordinator	TBC, Physics					
Course Aim	This course aims to introduce students to some of the more advant same time the course will also demonstrate some of the import physics textbooks. Students will undertake a small project to g physics.	ant 20th century experiment	s found in moderr			
Course Contents	The following experiments will be demonstrated; Compton scattering, Rutherford scattering, Gamma ray spectroscopy, Mossbauer spectroscopy, Mass spectroscopy, Optical pumping, Optical Spectroscopy, Electro spin resonance, Anomalous specific heat measurement, Low temperature measurements					
Learning Outcomes	On successful completion of the course, students should be able to - describe, analyse and compare a range of modern physics exper - operate standard instrumentation used in nuclear, atomic and sol - apply appropriate techniques to collect, process and interpret dat - design and conduct experiments to evaluate physical principles a - identify the problems in real experimental physics projects and for	riments lid state physics experiments a from experimental measure and hypotheses				
Pre-requisites	Pass in PHYS2321 and PHYS2322 and PHYS2323 and PHYS26	26				
Offer in 2012 - 2013	Not offered	Examination	To be confirmed			
Offer in 2013 - 2014	Y					

Teaching Hours	48 hours	of laboratory works; 6 hours of lectures plus demonstrations					
Assessment Method		Continuous assessment (100% weighting) including laboratory assessment, the keeping of laboratory logbook and writing a scientific style paper on project work.					
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.					
	в	Demonstrate substantial grasp of the subject. Evidence of analytical and critical abilities and logical thinking. Apply effective lab / fieldwork skills and techniques. Correct use of data of results to draw appropriate conclusions. Apply effective organizational and presentational skills.					
	с	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.					
Textbooks	Preston I	D.W. and E.R. Dietz: The Art of Experimental Physics (Wiley, 2009)					
References	Dunlap F	R.A: Experimental Physics: Modern Methods (Oxford University Press, 1988)					
Course Website	http://ww	w.physics.hku.hk/~phys3431/					

	project (12 o	credits)					Academic Year		2012
Offering Department	Physics						Quota		
Course Co-ordinator	Dr H F Cha	u, Physics							
Course Aim	provides stu theoretical	udents with th or experimer	e opportunity t	o comprehen supervision	sively study by an aca	a particular ademic staff.	ling a research p physics problem b The available pi	by th	emselves, eithe
Course Contents	contents an prospective Theoretical investigation need to per combination Experiment staff membi- preparation laser, high-	nd the nature supervisor and projects: The n which is clo rform some of n of both. In se al projects: The er. The stude of samples, vacuum and	of their projec and the course of student will se to research riginal calcula ome cases, it r he student will not will receive determination	ts in the com coordinator to receive train work in natu tions; to fill ii may be neces l carry out ex a comprehe of physical p ure technique	ing academ take this c ing in rese re, under th mathema sary to use periments in nsive training properties,	ic year. They ourse. arch literatur tical gaps of computers. n research la ng in advance measuremen	supervisors in M. must get the ap re reading and re- n of a staff memb- some sophisticat aboratories under ed experimental t t of small signals the relevant scie	prove eview er. T eed c the echn obs	al from both th ving, and mak The student ma derivations, or supervision of niques, includin cured by noise
Learning Outcomes	<ul> <li>plan and e</li> <li>review the</li> <li>criticise ex</li> <li>describe a</li> <li>(for theore</li> </ul>	execute a theo knowledge o kisting approa and explain co etical projects	f a physics pro ches for solvin nnections bety	erimental resemblem in dept blem in dept og the selecte ween physica	earch projec n through lit d problem. I principles	t on a specia erature revie and the study	l topic in physics w of books and re v problem. hem independent		
	- (for exper	imental proje	r existing solut cts) propose a rison with prec	ions and execute p	•	eriments, and	alyze results and	sour	
Pre-requisites	- (for exper the experim	imental proje	cts) propose a rison with pred	ions and execute p	•	eriments, and	alyze results and	sour	
•	- (for exper the experim	imental projection	cts) propose a rison with pred	ions and execute p	•	eriments, an	alyze results and		
Offer in 2012 - 2013	- (for exper the experim Pass in PH	imental projection	cts) propose a rison with pred	ions and execute p	•	eriments, and			rces of errors of
Offer in 2012 - 2013 Offer in 2013 - 2014	<ul> <li>- (for experimentation of the experi</li></ul>	imental projection for the second sec	cts) propose a rison with pred PHYS2323	ions and execute p lictions duled hours	bhysics exp	over two sem	Examination nesters. Students		rces of errors o
Offer in 2012 - 2013 Offer in 2013 - 2014 Teaching Hours	<ul> <li>- (for experimentation of the ex</li></ul>	imental project tent in compar YS2321 and F p instruction who will provid	cts) propose a rison with prec PHYS2323 up to 4 schee de individual in (100% weighti	ions and execute p lictions duled hours astruction on a	per week of a particular	over two sen physics proje	Examination nesters. Students	will	rces of errors o No Exam be assigned
Offer in 2012 - 2013 Offer in 2013 - 2014 Teaching Hours Assessment Method	<ul> <li>- (for experimentation of the ex</li></ul>	imental project nent in comparance YS2321 and F p instruction who will provide assessment	cts) propose a rison with prec PHYS2323 up to 4 schee de individual in (100% weighti	ions and execute p lictions duled hours astruction on a	per week of a particular	over two sen physics proje	Examination nesters. Students ct.	will	rces of errors o No Exam be assigned
Offer in 2012 - 2013 Offer in 2013 - 2014 Teaching Hours Assessment Method Course Grade	<ul> <li>- (for experimentation of the ex</li></ul>	imental projection in comparison of the comparis	cts) propose a rison with prec PHYS2323 up to 4 schee de individual in (100% weighti (100% weighti use ar ference aptiy. Cr	ions and execute p lictions duled hours astruction on a ng) in the form the subject. Show d critical analys ritical use of dat entational skills.	per week of a particular m of a repo	over two sem physics proje rt of 40-60 pa tical and critical of information c to draw approp	Examination nesters. Students ct.	will ures	nces of errors of No Exam be assigned and references igh quality source sions. Apply highly
Pre-requisites Offer in 2012 - 2013 Offer in 2013 - 2014 Teaching Hours Assessment Method Course Grade Grade Descriptors	<ul> <li>- (for experimentation of the experi</li></ul>	p instruction who will provid assessment presentation.	cts) propose a rison with prece PHYS2323 up to 4 schee de individual in (100% weighti . Insightful use ar ference aptly. Cr zational and press elevant to the topi ubstantial grasp o aution from sour	ions and execute p lictions duled hours astruction on a ng) in the for he subject. Sho of critical analys itical use of dat entational skills. <sup>1</sup> ic. f the subject. Ex- reces, showing rence aptly. Cor	per week of a particular m of a repo v strong analy is / evaluation a and results Work of A+ sh ridence of ana ability to ma	over two sem physics proje rt of 40-60 pa tical and critical of information c to draw approp ould show consi ulytical and critic ke meaningful	Examination nesters. Students ct. Iges (inclusive figures) abilities and logical th Irawn from a full ranger irate and insightful or	will ures hinkin e of h ponclus k bey	rces of errors of No Exam be assigned and references g, with evidence of igh quality source sions. Apply highly ond that is required king. Critical use of ferent secondary

	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.				
References	Recommer	Recommended reading material will be assigned by the project supervisor.				
Course Website	http://www.physics.hku.hk/~phys3531					

PHYS3987 Quantita	tive tools i	n physics (0	credits)			Academic Year	2012	
Offering Department	Physics		Quota	20				
Course Co-ordinator	Dr F K Cho	Dr F K Chow, Physics						
Course Aim	physics co who want involve he	omputation, exp to have a bette eavy computation	periment and prese or preparation for a onal and/or experim	se a few quantitative so entation through mainly physics and astronomy nental elements. Succes learning requirements fo	hands or research ssful comp	projects. It is desi career, in particular pletion of this pass/	gned for students , those works that fail course can be	
Course Contents	physics pr learning co project-bas	roblems. The ourse, students sed environme	choice of software are expected to ac ent. Students are e	as LabView, Mathematic is may vary from year ctively learn to use these expected to apply what hical systems, electric p	to year. software they have	Unlike an ordinary s through guided an /e learnt to investi	non-experientiand self studies in a gate and present	
Learning Outcomes	- recognise - solve phy	e the technique ysical problems	es of using software by using compute	dents should be able to: packages for solving p r algebra and programm solving physics-related	oroblems i iing			
Pre-requisites	Pass in PH	HYS1414 and F	PHYS1415 and PH	YS2627				
Offer in 2012 - 2013	Year long					Examination	No Exam	
Offer in 2013 - 2014	Y							
Teaching Hours	14 hours o	of lectures and	tutorials; 60 hours o	of hands on experience a	and self s	tudy; 60 hours of pi	oject work.	
Assessment Method	Two projec	ct reports and p	presentations (100%	% weighting)				
Course Grade	Pass/Fail							
Grade Descriptors	Pass Demonstrate ability of applying knowledge to solve problems in the workplace. Successfully handle and carry out the work required in the job or assigned by supervisor(s). Establish effective collaboration and communication with supervisor(s), colleagues, and clients in the job. Successfully fulfill the requirements set out in the Course Description regarding working hours, written and oral report, and evaluation by supervisor(s), etc.							
	Fail Demonstrate very limited or no ability of applying knowledge to solve problems in the workplace. Fail to handle or carry out the work required in the job or assigned by supervisor(s). Fail to establish effective collaboration or communication with supervisor (s), other colleagues, or clients in the job. Fail to satisfy the requirements set out in the Course Description regarding working hours, written and oral report, or evaluation by supervisor(s), etc.							
Textbooks				ematica (Academic Pres nd Scientists (Prentice H				
References	Kathy Sier	rra and Bert Ba	tes: Head First Jav	tica, (McGraw-Hill, 2009 a (O'Reilly Media, Inc., 2 - Java, Volume IFunda	2005, 2nd	ed.)	Press, 2007, 8tł	

PHYS3988 Physics	nternship (6 credi	its)			Academic Year	2012		
Offering Department	Physics	Physics Quota						
Course Co-ordinator	Dr F C C Ling, Phys	sics						
Course Aim	This course aims to the major(s) of st		e opportunities to g	ain work experience	in the field of phys	cs that are related		
Course Contents	University in a com obtained by studen	pany, government ts themselves. In t	department or NG the latter case, the	at least 160 hours O. The internship m internship must be course coordinator is	ay be arranged by in a relevant field to	the Department or		
Learning Outcomes		has learned in his pose or design pa	/her major to a real rt of the project he/	-life situation in eithe she is working on du		ch environment		
Pre-requisites	Students are expec	ted to have satisfa	ctorily completed th	neir Year 2 study.				
Offer in 2012 - 2013	1st sem 2nd sem	Summer			Examination	No Exam		
Offer in 2013 - 2014	Y							

Teaching Hours		No formal teaching. It is expected that students are to work at least 160 hours (lunch hour excluded) in at least 20 working days.					
Assessment Method	performance will assess	written report plus an oral presentation. Supervisors are required to assess the student based on their erformance during the internship period (in the case of internships outside the University, the Internal Supervisor vill assess the student based on the feedback of the External Supervisor). Satisfactory completion of this course an be counted towards the Experiential Learning requirement.					
Course Grade	Pass/Fail						
Grade Descriptors	Pass	Demonstrate ability of applying knowledge to solve problems in the workplace. Successfully handle and carry out the work required in the job or assigned by supervisor(s). Establish effective collaboration and communication with supervisor(s), colleagues, and clients in the job. Successfully fulfill the requirements set out in the Course Description regarding working hours, written and oral report, and evaluation by supervisor(s), etc.					
	Fail	Demonstrate very limited or no ability of applying knowledge to solve problems in the workplace. Fail to handle or carry out the work required in the job or assigned by supervisor(s). Fail to establish effective collaboration or communication with supervisor (s), other colleagues, or clients in the job. Fail to satisfy the requirements set out in the Course Description regarding working hours, written and oral report, or evaluation by supervisor(s), etc.					
Remarks	who have co Satisfactory internship w Students wh Visit http://w Enrolment co	hours, written and oral report, or evaluation by supervisor(s), etc. Students are expected to have satisfactorily completed their Year 2 study. Special consideration be given to thos who have completed Year 1. Satisfactory completion of this course can be counted towards the Experiential Learning requirement. Details content internship will be recorded on the student's transcript. This course will be assessed on Pass or Fail basis Students who are interested to enrol in this course should contact the Department to obtain the approval. Visit http://www.hku.hk/science/current/bsc/internship/ for more information. 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.					

PHYS6501 Compute	r controlle	d measurements in physics (6 credits)	Academic Year	2012				
Offering Department	Physics		Quota					
Course Co-ordinator	Dr A B Dju	Dr A B Djurisic, Physics						
Course Aim	measurem	f this course is to provide students with practical skills for design ent systems. In addition to measurement software development on of commonly used components in measurement systems	skills, the students	will learn principles				
Course Contents	measurem	lude: Measurement uncertainties, standards, and calibration; R ent results; Signals and noise, two-wire and four-wire sensing, and Labview software, basics of dynamic systems, feedbac monochromators, spectrometers, photometry and radiometry. Me	passive and active k and control, PID	circuits, compute controllers. Light				
Learning Outcomes	<ul> <li>explain m</li> <li>identify p</li> <li>compare</li> <li>suitability f</li> </ul>	sful completion of the course, students should be able to: neasurement uncertainties, concepts of repeatability and reproduc ossible sources of noise in measurements and propose methods different measurement techniques and instrumentation, recogn or a specific measurement. view programs to control measurement instrumentation.	to minimize the effe	ct of noise.				
Pre-requisites	Pass in PH	IYS3331 or PHYS3431						
Offer in 2012 - 2013	Not offered	ł	Examination	To be confirmed				
Offer in 2013 - 2014	N							
Teaching Hours	36 hours o	f lectures, tutorials, and laboratory work						
Assessment Method		ur written examination (60% weighting), laboratory work (10% v % weighting)	weighting), and cou	rse work or a min				
Course Grade	A+ to F							
Grade Descriptors	А	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 cour learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge familiar and some unfamiliar situations. Apply effective organizational and presentational skills. Apply effective lab skills a 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 learnin outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to mo familiar situations. Apply moderately effective organizational and presentational skills. Apply moderately effective lab skills ar 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 a Show evidence of some coherent and logical thinking, but with limited analyt apply knowledge to solve problems. Apply limited or barely effective organiza effective lab skills and techniques. Limited ability to use data and results to draw	tical and critical abilities. ational and presentation	Show limited ability to al skills. Apply partially				
	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.							
Textbooks	Lecture no	tes provided by course coordinator						
References		and G. Piani: Computer Systems for Automation and Control (Pre ourn: Modern Instrumentation for Scientists and Engineers (Spring						

	L. Kirkup and B. Frenkel: An Introduction to Uncertainty in Measurement (Cambridge, 2006) J. Fraden: AIP Handbook of Modern Sensors: Physics, Designs, and Applications (AIP, 1995)
Course Website	http://www.physics.hku.hk/~phys6501/

PHYS6502 Advance	d statistic	cal mecha	nics (6 credits)			Academic Year	2012	
Offering Department	Physics					Quota		
Course Co-ordinator	Prof J Wa	Prof J Wang, Physics						
Course Aim	This cour	irse intends t	o introduce some a	dvanced topics in the f	ield of equilibri	um statistical physic	cs.	
Course Contents	Quantum	n mechánica	al ensemble theory	ensemble, the canonic . Theory of simple g ems. Some topics in the	jases, ideal B	ose systems, idea	I Fermi systems	
Learning Outcomes	- discuss - solve th - explain	On successful completion of the course, students should be able to: discuss the various classical ensembles and quantum ensembles solve the statistical mechanics problems using ensemble theory explain the connection between classical statistical mechanics and quantum statistical mechanics explain the concept of density matrix						
Pre-requisites	Pass in P	PHYS2322 a	nd PHYS2627 and	I (PHYS3332 or PHYS	3336)			
Offer in 2012 - 2013	1st sem					Examination	Dec	
Offer in 2013 - 2014	N							
Teaching Hours	36 hours	s of lectures a	and tutorials.					
Assessment Method		our written ents (30% w		weighting), and contin	nuous assessi	ment including test	s and homewo	
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	Show evid	ence of some coherent	mmand of knowledge and sk and logical thinking, but wi s. Apply limited or barely effe	th limited analytic	al and critical abilities.	Show limited ability	
	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.							
Textbooks	Lecture n	notes provide	ed by course coord	inator.				
References			al mechanics ergersen: Equilibriu	im statistical physics.				

PHYS6503 Advance	d electroma	netic field theory (6 credits)	Academic Year	2012				
Offering Department	Physics Quota							
Course Co-ordinator	Prof Z D Wa	ig, Physics	·					
Course Aim		The aim of this course is to provide students with the advanced level of comprehending on the theory of classi electromagnetic field, enabling them to master key analytical tools for solving real physics problems.						
Course Contents	Function me	This course will introduce and discuss the following topics: Boundary-value problems in electrostatics and Gree Function method, Electrostatics of Media, Magnetostatics, Maxwell's equations and conservation laws, Gauge transformations, Electromagnetic waves and wave guides.						
Learning Outcomes	<ul> <li>analyse an</li> <li>comprehen</li> <li>recognise</li> </ul>	Il completion of the course, students should be able to: solve various electrostatic and magnetostatic problems and explain many electromagnetic phenomena, and comprehend the important concepts of conserva- ry helpful for doing research in future		sformations, whicl				
Pre-requisites	Pass in PHY	53331						
Offer in 2012 - 2013	2nd sem		Examination	May				
Offer in 2013 - 2014	Y							
Teaching Hours	36 hours of I	ectures and tutorials						
Assessment Method		written examination (80% weighting), and continuous (20% weighting)	assessment including tes	sts and homewor				
Course Grade	A+ to F							
Grade Descriptors		Demonstrate thorough mastery at an advanced level of extensive kr	owledge and skills required for a	attaining all the course				

	A	learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.					
	В	Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.					
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.					
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.					
	Fail	Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.					
Textbooks	J.D. Jacl	kson: Classical Electrodynamics (John Wiley & Sons, 1999)					
References	L.D. Lan	L.D. Landau and E.M. Lifshitz: Classical Theory of Fields (Pergamon, 1982)					
Course Website	http://ww	w.physics.hku.hk/~phys6503/					

PHYS6504 Advance	d quantum	m mech	anics (6 credits)		Academic Year	2012		
Offering Department	Physics	Physics Quota						
Course Co-ordinator	Prof S Q Shen, Physics							
Course Aim				senior undergraduates to th topics in condensed matter p		niques in quantum		
Course Contents	and cons	servation		Dirac notation, quantum dyr nmetry and identical partic ics				
Learning Outcomes	<ul> <li>formulate</li> <li>examine</li> <li>argue the</li> <li>explain p</li> <li>analyse p</li> </ul>	On successful completion of the course, students should be able to: formulate and solve problems in quantum mechanics using Dirac notation examine and predict the properties of identical quantum particles argue the importance of symmetry and conservation laws in quantum mechanics explain physical phenomena in the modern language of quantum mechanics; analyse physical system in a quantum mechanical way recognise the connection between relativity and quantum mechanics						
Pre-requisites	Pass in Ph	PHYS3332	2					
Offer in 2012 - 2013	1st sem				Examination	Dec		
Offer in 2013 - 2014	Y							
Teaching Hours	36 hours o	of lecture	s and tutorials					
Assessment Method			n examination (70% we weighting)	eighting), and continuous as	ssessment including tes	ts and homework		
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	Show e	vidence of some coherent and	and of knowledge and skills required d logical thinking, but with limited a pply limited or barely effective organ	analytical and critical abilities.	Show limited ability to		
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning ou Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge problems. Organization and presentational skills are minimally effective or ineffective.							
Textbooks	Lecture no	notes prov	ided by Course Coordina	ator				
References			ern Quantum Mechanics m Mechanics (McGraw-ł	(Addison-Wesley, 1994); Hill, 1968)				
Course Website	http://www	w.physics	.hku.hk/~phys6504/					

PHYS6505 Solid stat	e physics (6 credits)	(6 credits) Academic Year 2012				
Offering Department	Physics Quota					
Course Co-ordinator	Prof J Wang, Physics					
Course Aim	To provide students with an understanding of more advanced topics in selected areas of solid state physics.					
Course Contents	Bloch theory. Nearly free electrons and tight binding model. Band structure calculations for realistic systems. The					

	semi-classical model of electron dynamics. Ab initio total energy calculations and other advanced topics.						
Learning Outcomes	On successful completion of the course, students should be able to: - discuss various methods to calculate the band structures and the major approximations that have been used - discuss various minimization methods - discuss the concepts of density functional theory - explain the concept of first principle calculation and various approximations used						
Pre-requisites	Pass in PHYS2221 and PHYS2322 and PHYS3332						
Offer in 2012 - 2013	Not offer	ed	Examination	To be confirmed			
Offer in 2013 - 2014	Y						
Teaching Hours	36 hours of lectures and tutorials.						
Assessment Method	One 3-hour written examination (70% weighting), and continuous assessment including tests and homework assignments (30% weighting)						
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.					
	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.						
Textbooks	Lecture notes provided by Course Coordinator.						
References	C. Kittel: Introduction to Solid State Physics (John Wiley, 1996); N.W. Ashcroft and D.N. Mermin: Solid State Physics (Holt, Rinehart and Winston, 1987).						

ENVS2006 Environm	Academic Year	2012					
Offering Department	Physics			Quota			
Course Co-ordinator	Dr J K C Leung, Physics						
Course Aim	In this course, students will learn about various kinds of radiations in the environment, the experimental technique to detect them, the methods to trace them and to assess their hazard to the environment, and the ways to reduc the hazard in events of nuclear accidents or incidents.						
Course Contents	The course will cover naturally occurring radiation sources and man-made radiation sources including nuclea power plants; transport models for radionuclides in the environment; nuclear accidents and its impact to the environment; radiation risk assessment and emergency preparedness; techniques for measuring low leve radioactivities; nuclear techniques in ecology; concept of radiation protection to human species and non-human species.						
Learning Outcomes	On successful completion of this course, students should be able to: - realise sources and transport of radionuclides in the environment - explain and assess the impact to the environment from the use of nuclear energies - detect and measure low level radioactivities in environmental samples - justify, optimize, and assess the risk of using radiation and nuclear technologies - compare and contrast the environmental impacts from nuclear energy and other forms of energy						
Pre-requisites	Pass in ENVS0001 or PHYS1417						
Offer in 2012 - 2013	Not offered Examination To b				To be confirme		
Offer in 2013 - 2014	N						
Teaching Hours	36 hours of lectures and tutorials, laboratory, presentations, and discussions						
Assessment Method	One 2-hour written examination (60% weighting), and continuous assessment including student presentations assignments, and laboratory work (40% weighting)						
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 abilit to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills. Apply highly effective lab skills and techniques. Critical use of data and results to draw appropriate and insightful conclusions.						
	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills. Apply effective lab skills and techniques. Correct use of data of results to draw appropriate conclusions.						
	C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills. Apply moderately effective lab skills and techniques. Mostly correct but some erroneous use of data and results to draw appropriate conclusions.						
	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes.						

# Department of Physics

	D	Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills. Apply partially effective lab skills and techniques. Limited ability to use data and results to draw appropriate conclusions.
	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.
Textbooks		nbud and Thomas Gesell: Environmental Radioactivity: from Natural, Industrial, and Military Sources Press, 1997))
References		Norris: The Environmental Case for Nuclear Power (Paragon House, 2000) ansky: Nuclear Energy - Principles, Practices and Prospects (American Institute of Physics Press,

ENVS2010 Sustaina	ble energy	and environment (6 credits)		Academic Year	2012		
Offering Department	Physics			Quota			
Course Co-ordinator	Dr A B Dju	isic, Physics					
Course Aim	technologie technologie	In this course, the students will learn about sustainability and environmental impact of different energy technologies, including conventional energy sources as well as renewable and/or clean energy sources. The technological challenges, potential for future development, and environmental impacts (community, regional, and global) will be discussed.					
Course Contents	making the	The course will cover energy production and use, environmental impact of energy use, fossil fuels and methods for making them more sustainable, clean fuels, electricity generation, renewable energy technologies (with emphasis on biomass, wind and solar energy), hydrogen, energy storage, and energy conservation.					
Learning Outcomes	- define the - explain th	On successful completion of this course, students should be able to: - define the concept of sustainable development - explain the challenges and potential for development of various energy technologies - compare the environmental impact of conventional and new energy technologies					
Pre-requisites	Pass in EN	VS0001 or PHYS1417					
Offer in 2012 - 2013	Not offered			Examination	To be confirmed		
Offer in 2013 - 2014	Y						
Teaching Hours	36 hours o	lectures and tutorials, laboratory, presentations, and	discussions				
Assessment Method		written examination (50% weighting), and continus, and laboratory work (50% weighting)	ious assessm	ent including stud	dent presentations		
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.					
	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.						
Textbooks	Lecture no	es provided by course coordinator					
References	G. Boyle, I University,	yle: Renewable Energy: Power for a Sustainable Futu . Everett, J. Ramage: Energy Systems and Sustain 2003) nd D. A. J. Rand: Clean Energy (The Royal Society of	ability: Power	for a Sustainable			

SCNC2005 Career d	evelopmen	it for science stu	idents (o credits)		Academic Year	2012
Offering Department	Faculty				Quota	200
Course Co-ordinator	Dr N K Tsi	ng, Faculty				
Course Aim	and careed discussion	r preparation skills t , role play and comp aining to enhance c	ed for second and third ye through a variety of activiti pany visits, all of which aim communication, presentation	es including lectur to facilitate studer	res, practical works nts in making inform	hops, small group ed career choices
Course Contents	(2) Career (3) Skill-ba (4) Comm	<ul> <li>(1) Career Readiness: MBTI personality test, CV and interview preparation;</li> <li>(2) Career Exposure: networking, skills, company visits;</li> <li>(3) Skill-based Training: presentation skills, group discussion skills;</li> <li>(4) Communication &amp; Adjustment: Time and stress management, work attitude, communication and relationship management.</li> </ul>				
Learning Outcomes	<ul> <li>comprehe</li> <li>have enh</li> <li>stress and</li> <li>apply kno</li> <li>have visit</li> </ul>	end the current empl nanced their career a relationship manage weledge learned in cl	e course, students should b loyment market situations for and personal skills in comr ement for employment lass and workshops to prod pany and gained understan	or science students nunication, presen uce a CV and prep	tation, networking, to a the for job application	ons and interview
Pre-requisites	Students a	re expected to have	satisfactorily completed the	eir Year 1 study.		
Offer in 2012 - 2013	1st sem	2nd sem			Examination	No Exam
Offer in 2013 - 2014	Y					
Feaching Hours	30 hours o	f lectures/workshops	s/out-campus practices and	company visits.		
Assessment Method			se work (100%). Satisfactor ient. This course will be ass			ounted towards th
Course Grade	Pass/Fail					
Grade Descriptors	Pass Demonstrate mastery of knowledge and skills required for attaining most of the course learning outcomes. Successfully meet all the following requirements: (i) attend at least 80% of the lectures and workshops of the course, (ii) attend at least one company visit, and (iii) pass in all assessment tasks of the course.					
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Fail to meet one or more of the following requirements: (i) attend at least 80% of the lectures and workshops of the course, (ii) attend at least one company visit, and (iii) pass in all assessment tasks of the course.					
Course Website	http://www	.hku.hk/science/curr	ent/cdp/career_deveopmen	t_prog_0908.html		
Remarks	1. This cou students w 2. Student	irse is exclusively fo ho have not satisfied s who take this cou	satisfactorily completed the or second and third year BS d any Experiential Learning urse for satisfying the Expe course in their primary Scie	c students only. F requirements. riential Learning re	equirement must ta	ke an additional

SCNC2988 Service I	earning into	ernsnip (V creaits)	Academic Year	2012		
Offering Department	Faculty		Quota			
Course Co-ordinator	Dr N K Tsir	ng, Faculty				
Course Aim	activities ar Though it i knowledge achieve so	e aims to offer students the opportunities to learn through ac nd to help develop their social consciousness and commitment may not be related to their major of study, it would be of gr and scientific mind acquired in their study to provide meaning me educational aims of the University, such as leadership and a nd tackling novel situations.	so as to become a re eat benefits to stude oful services to socie	esponsible citizer nts to apply thei ty. It also aims to		
Course Contents	arranged by (1) Within t various tasl (2) Outside Aim. Exam under a sta Internal Su	<ul> <li>Students have to take on at least 120 hours of internship work either within the University or outside the University arranged by the Faculty.</li> <li>(1) Within the university: The student will be supervised by a staff member (Supervisor), working on a project or various tasks pertaining to the Course Aim as instructed by the Supervisor.</li> <li>(2) Outside the university: The student will work in an external agency on projects or tasks pertaining to the Course Aim. Examples of these agencies are NGO, or community service providers. The student will be supervised under a staff member of the external agency (the External Supervisor) and a staff member of the Faculty (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.</li> </ul>				
_earning Outcomes	- gain first h - acquire ar - develop th	On successful completion of the course, students should be able to: - gain first hand work experience in providing services that meet actual society needs - acquire an understanding and appreciation of the services they engaged in the internship - develop their social consciousness, responsibility, and commitment - apply learned knowledge in solving practical problems that concern the society or community				
Pre-requisites	Students a	re expected to have satisfactorily completed their Year 1 study.				
Offer in 2012 - 2013	Summer		Examination	No Exam		
Offer in 2013 - 2014	Y					
Teaching Hours		eaching, but it is expected that students are to work at least 12 n at least 15 working days in an organization arranged by the Fa		work (lunch hou		
Assessment Method	their interns	letion of the internship, each student is required to submit a writ ship experience. Supervisors are required to assess the student period. The internal supervisor will assess the student bas	s based on their perfo	rmance during th		
Course Grade	Pass/Fail					
Grade Descriptors	Pass Demonstrate successful attainment of most of the course learning outcomes. Successfully handle and carry out the work required in the job or assigned by supervisor(s). Establish effective collaboration and communication with supervisor(s), colleagues, and clients in the job. Successfully fulfill the requirements set out in the Course Description regarding working hours, written and oral report, and evaluation by supervisor(s), etc.					
	Fail Demonstrate very limited or no attainment of the course learning outcomes. Fail to handle or carry out the work required in the job or assigned by supervisor(s). Fail to establish effective collaboration or communication with supervisor(s), other colleagues, or clients in the job. Fail to satisfy the requirements set out in the Course Description regarding working hours, written and oral report, or evaluation by supervisor(s), etc.					
Remarks	Students en course (e.g counted tov assessed o Enrolment	re expected to have satisfactorily completed their Year 1 study. ngaging in the internship related to their major of study should e g. CHEM3988 Chemistry Internship), not this course. Satisfac wards the EL requirement. Details of internship will be recorde in Pass or Fail basis. of this course is not conducted via the online course selection s ce after approval has been obtained from the course coordinator	tory completion of th d on the transcript. T ystem and should be	is course can be his course will b		

	-		hods (6 cred	113)			Academic Year	2012	
Offering Department	Statistics a	and Actu	arial Science				Quota		
Course Co-ordinator	Mrs G M J	Jing, Sta	tistics and Actua	arial Science					
Course Aim	situations test the ac successful researche	s involving acceptabi ul investi ers. Micr	g variability and lity of a certain gation. The cou	uncertainty. The new hypothes urse aims to ght be used	They are used sis. Valid meth present the fu	to estimate the nods of analysin undamentals of	nent/survey are ofte true value of a cert g the data are thus statistical methods analysis. There is	ain qua essent widely	intity or t tial to an used b
Course Contents	Presentation Laws, Condistribution Confidence	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 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, Elementary Time Series, Index Numbers							
Learning Outcomes	<ul> <li>select an</li> <li>perform s</li> <li>understa</li> <li>gain fami</li> <li>make infe</li> <li>determine</li> <li>write app</li> </ul>	nd use a statistica and and a niliarity w ferences ne the mo propriate and the	conclusions ba	tical methods calculator and cepts of proba ntal concepts based on sar statistical meth sed on the stat	to analyze dat Microsoft Exce bility of random vari nple data nod to use for a atistical results	a el ables a given statistica	l problem n and their applicat	tions to	practica
Pre-requisites	Not for stu Not for stu	udent wit udent wit udents w		AS Math & St	,	llowing courses	STAT1801, STAT	)302, S	TAT130
Offer in 2012 - 2013	1st sem	2nd sen	n				Examination	Dec	May
Offer in 2013 - 2014	Y								
Feaching Hours	The course	se consis	ts of 36 lectures	and 12 tutori	als/example cla	asses.			
Assessment Method	One 2-hou and a clas		n examination (7		<b>、</b> .	arly (OEO/ waight	ing) bacad an accig	nmonto	
		ssiesi	(	'5% weighting	) and coursew	ork (25% weight	ing) based on assig	nments	, tutorial
Course Grade	A+ to F	ssiesi		'5% weighting	) and coursew	ork (25% weight	ing) based on assig	ninents	, tutorial
Course Grade Grade Descriptors	A+ to F	Demon learning to appl	strate thorough ma g outcomes. Show s	stery at an adva	nced level of exte	ensive knowledge and logical thinking	nd skills required for atta , with evidence of origina s. Apply highly effective	aining all al thought	the cours
		Demon learnin to appl presen Demon learnin	strate thorough ma g outcomes. Show s y knowledge to a v tational skills. strate substantial c g outcomes. Show	stery at an adva strong analytical a vide range of cor pommand of a bro evidence of ana	nced level of exte and critical abilities nplex, familiar and ad range of knowl	ensive knowledge an and logical thinking d unfamiliar situation ledge and skills requ	nd skills required for atta , with evidence of origina ns. Apply highly effective uired for attaining at leas thinking, and ability to	aining all al thought e organiz t most of	the cours , and abilit ational an the cours
	A	Demon learnin to appl presen Demon familiar Demon outcom	strate thorough ma g outcomes. Show s y knowledge to a v tational skills. strate substantial c g outcomes. Show and some unfamilia istrate general but les. Show evidence	stery at an adva strong analytical a vide range of cor ommand of a bro evidence of ana ar situations. App incomplete comr of some analytic	nced level of exte and critical abilities mplex, familiar and ad range of knowl lytical and critical ly effective organization and of knowledg al and critical abil	ensive knowledge an and logical thinking d unfamiliar situation ledge and skills requ abilities and logical zational and present le and skills require	nd skills required for atta , with evidence of origina is. Apply highly effective irred for attaining at leas thinking, and ability to ational skills. d for attaining most of king, and ability to apply	aining all al thought e organiz t most of apply kn the cours	the cours, , and abilit ational and the cours owledge to se learning
	A	Demon learning to appl present familian Demon outcom familian Demon Show o	strate thorough ma g outcomes. Show s y knowledge to a v tational skills. strate substantial ci g outcomes. Show and some unfamilia strate general but ses. Show evidence situations. Apply m strate partial but lim evidence of some c	stery at an adva strong analytical a vide range of cor ommand of a bro evidence of ana ar situations. App incomplete comm of some analytic ooderately effectiv iited command of oherent and logi	nced level of exte and critical abilities nplex, familiar and ad range of knowl lytical and critical ly effective organiz nand of knowledg al and critical abil e organizational a i knowledge and s cal thinking, but w	ensive knowledge an and logical thinking d unfamiliar situation ledge and skills require abilities and logical zational and present ities and logical thir nd presentational sk kills required for atta ith limited analytica	nd skills required for atta , with evidence of origina is. Apply highly effective irred for attaining at leas thinking, and ability to ational skills. d for attaining most of king, and ability to apply	aining all al thought organiz t most of apply kn the cours / knowled	the cours, , and abiliti ational and the cours owledge to se learning tge to most outcomest
	A B C	Demon learnin to appl presen Demon learnin familia Demon familia Demon Show e apply k Demon Lack o	strate thorough ma g outcomes. Show s y knowledge to a v tational skills. strate substantial ci g outcomes. Show and some unfamilia strate general but les. Show evidence situations. Apply m strate partial but lim evidence of some c nowledge to solve p strate little or no evi f analytical and criti	stery at an adva strong analytical a vide range of cor ommand of a bro evidence of ana ar situations. App incomplete comm of some analytic oderately effectiv hited command of oherent and logi oroblems. Apply li vidence of comm cal abilities, logic	nced level of exte and critical abilities mplex, familiar and ad range of knowl lytical and critical ly effective organiz nand of knowledg al and critical abil re organizational a f knowledge and s cal thinking, but w mited or barely eff and of knowledge al and coherent th	ansive knowledge an and logical thinking d unfamiliar situation ledge and skills requi- abilities and logical actional and present ities and logical thir nd presentational sk kills required for atta vith limited analytica ective organizationa and skills required	nd skills required for atta , with evidence of origina is. Apply highly effective aired for attaining at leas thinking, and ability to ational skills. d for attaining most of king, and ability to apply ills. ining some of the course I and critical abilities. St I and presentational skills for attaining the course the or no ability to apply	aining all al thought e organiz t most of apply kn the cours / knowled e learning ow limite s.	the cours , and abili ational an the cours owledge t se learnin ge to mos g outcome: d ability t outcome:
	A B C D Fail	Demon learnin, to appl presen Demon outcom familian Demon Show e apply k Demon Lack o probler	strate thorough ma g outcomes. Show s y knowledge to a v tational skills. strate substantial ci g outcomes. Show and some unfamilia strate general but les. Show evidence situations. Apply m strate partial but lim evidence of some c nowledge to solve p strate little or no evi f analytical and criti	stery at an adva strong analytical a vide range of cor ommand of a bro evidence of ana ar situations. App incomplete comm of some analytic oderately effectiv ited command of oherent and logi roblems. Apply li vidence of comm cal abilities, logic d presentational s	nced level of exte and critical abilities nplex, familiar and ad range of knowl lytical and critical ly effective organiz nand of knowledge al and critical abil e organizational a knowledge and s cal thinking, but w mited or barely eff and of knowledge al and coherent th skills are minimally	ansive knowledge and and logical thinking d unfamiliar situation ledge and skills required abilities and logical zational and present lee and skills required inties and logical thir ind presentational sk kills required for atta ith limited analytica ective organizationa e and skills required inking. Show very I	nd skills required for atta , with evidence of origina is. Apply highly effective aired for attaining at leas thinking, and ability to ational skills. d for attaining most of king, and ability to apply ills. ining some of the course I and critical abilities. St I and presentational skills for attaining the course the or no ability to apply	aining all al thought e organiz t most of apply kn the cours / knowled e learning ow limite s.	the cours , and abili ational an the cours owledge t se learnin ge to mos g outcome: d ability t outcome:
Grade Descriptors	A B C D Fail Chiu W. K Larson, R. Berk, K.N.	Demon learnin, to appl presen Demon outcom familian Demon Show e apply k Demon Lack o probler X.: Basic X. & Farbul	strate thorough ma g outcomes. Show s y knowledge to a v tational skills. strate substantial c g outcomes. Show and some unfamilia istrate general but ies. Show evidence situations. Apply m istrate partial but line avidence of some c nowledge to solve p strate little or no ev f analytical and criti ns. Organization an Statistics (Pears er, B.: Elementa y, P.: Data Analy	stery at an adva strong analytical a vide range of cor evidence of ana ar situations. App incomplete comm of some analytic oderately effectiv vidence of comm cal abilities, logic d presentational s son (Asia), 200 ry Statistics, F ysis with Micro	nced level of exte and critical abilities mplex, familiar and ad range of knowl lytical and critical y effective organiz nand of knowledg al and critical abil e organizational a i knowledge and cal thinking, but w mited or barely eff and of knowledge al and coherent th skills are minimally 07) Dicturing the W posoft EXCEL ([	ensive knowledge an and logical thinking d unfamiliar situation ledge and skills required abilities and logical zational and present re and skills required ities and logical thir ind presentational sk kills required for atta <i>i</i> th limited analytical ective organizational e and skills required inking. Show very I effective or ineffect	nd skills required for atta , with evidence of origina is. Apply highly effective thinking, and ability to ational skills. d for attaining most of king, and ability to apply ills. ining some of the course I and critical abilities. St I and presentational skills for attaining the course ttle or no ability to apply ve. all, 2008, 4th ed.) Jpdate Office 2007)	aining all al thought e organiz t most of apply kn the cours / knowled e learning ow limite s.	the cours , and abili ational an the cours owledge t se learnin ge to mos g outcome: d ability t outcome:
Grade Descriptors	A B C D Fail Chiu W. K Larson, R. Berk, K.N.	Demon learnin, to appl presen Demon outcom familiar Demon familiar Demon familiar Chemon Show e apply k Demon Lack o probler C.: Basic R. & Farbu J. & Care J. E. & Pe	strate thorough ma g outcomes. Show s y knowledge to a v tational skills. strate substantial c g outcomes. Show and some unfamilia istrate general but ies. Show evidence situations. Apply m istrate partial but line avidence of some c nowledge to solve p strate little or no ev f analytical and criti ns. Organization an Statistics (Pears er, B.: Elementa y, P.: Data Analy	stery at an adva strong analytical a vide range of cor evidence of ana ar situations. App incomplete comm of some analytic oderately effectiv vidence of comm cal abilities, logic d presentational s son (Asia), 200 ry Statistics, F ysis with Micro	nced level of exte and critical abilities mplex, familiar and ad range of knowl lytical and critical y effective organiz nand of knowledg al and critical abil e organizational a i knowledge and cal thinking, but w mited or barely eff and of knowledge al and coherent th skills are minimally 07) Dicturing the W posoft EXCEL ([	ensive knowledge ar and logical thinking d unfamiliar situation ledge and skills required abilities and logical actional and present ities and logical thir nd presentational sk kills required for atta ith limited analytica ective organizational and skills required inking. Show very l effective or ineffect Corld (Prentice H Duxbury press, U	nd skills required for atta , with evidence of origina is. Apply highly effective thinking, and ability to ational skills. d for attaining most of king, and ability to apply ills. ining some of the course I and critical abilities. St I and presentational skills for attaining the course ttle or no ability to apply ve. all, 2008, 4th ed.) Jpdate Office 2007)	aining all al thought e organiz t most of apply kn the cours / knowled e learning ow limite s.	the cours , and abili ational ar the cours owledge t se learnin ge to mo g outcome d ability t

STAT0302 Business	s statistics (6 credits)	Academic Year	2012		
Offering Department	Statistics and Actuarial Science	Quota			
Course Co-ordinator	Dr K S Chong, Statistics and Actuarial Science				
Course Aim	The discipline of statistics is concerned with situations involving uncertainty and variability. Variability greatly affects the interpretation of data. Thus statistics forms an important descriptive and analytical tool. This elementary course, which is taught without much technical mathematics, presents many standard situations of data analysis and interpretation with emphases on business examples. The statistical tests of these situations are presented. Microsoft Excel might be used to carry out some statistical analysis.				
Course Contents	The course will introduce and discuss the following topics: Presentation of D Measures of Variability and Uncertainty, Elementary Probability Rules and B Binomial, Normal, Poisson, Hyper-geometric and Geometric, Random Samp	asic Probability Dist	ributions such as		

	for Means	nation, Confidence Intervals and Sample Size De and Proportions as well as the Chi-square tests, S Index Numbers	· • • • •	0	0	
Learning Outcomes	<ul> <li>understa</li> <li>perform s</li> <li>draw con</li> <li>understa</li> <li>gain fami</li> <li>make info</li> <li>determin</li> <li>gain fami</li> <li>understa</li> </ul>	sful completion of the course, students should be a d the methods for describing sets of data atistical analysis with calculator and Microsoft Exc clusions from data using numerical summaries d and apply basic concepts of probability arity with the fundamental concepts of random val rences on a population based on sample data the most appropriate statistical method to use for arity with the fundamental concepts of statistical in d the basic principles of simple linear regression today's society.	cel riables r a given statistical nference as they a	pply to a variety c		
Pre-requisites	Not for stu	ss School students only; and lents who have passed or enrolled in any of the fe ECON1003	ollowing courses: \$	STAT0301, STAT	1301, S	TAT1306,
Offer in 2012 - 2013	1st sem	nd sem	1	Examination	Dec	May
Offer in 2013 - 2014	Y					
Teaching Hours	The cours	consists of 36 lectures and 12 tutorials/example c	classes.			
Assessment Method		examination (75% weighting) and a coursework d a class test	assessment (25%	weighting) base	d on ass	ignments,
Course Grade	A+ to F					
Grade Descriptors	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.					
	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.					
	C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.					
	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.					
	Fail	Demonstrate little or no evidence of command of knowledg Lack of analytical and critical abilities, logical and coherent to problems. Organization and presentational skills are minimal	thinking. Show very littl	le or no ability to app		
Textbooks	Gerald Ke	er: Managerial Statistics (Cengage Learning, 2009	9, 8th edition)			
References	Berk, K.N.	E. & Perles, B. M.: Modern Elementary Statistics (f & Carey, P.: Data Analysis with Microsoft EXCEL ( B.L. & O'Connell, E.S.: Business Statistics in P	(Duxbury press, Up	odate Office 2007		2008, 5th
Course Website	webct.hku	nk				
Remarks	Nil					

STAT1301 Probability	y and statistics I (6 credits)	Academic Year	2012		
Offering Department	Statistics and Actuarial Science	Quota			
Course Co-ordinator	Dr Y K Chung, Statistics and Actuarial Science				
Course Aim	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 background of motivating problems this course develops relevant probability models for the description of such uncertainty and variability.				
Course Contents	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.				
Learning Outcomes	On successful completion of the course, students should be able to: - understand the basic concepts in probability theory - gain some insights to statistics and inference - solve real-world problem by using probability calculations - pursue their further studies in statistics				
Pre-requisites	(E or above in AL PM; or Pass in MATH0211); and Not for students who have passed in STAT1306, or have already enrolled in th Not for students who have passed in STAT1801, or have already enrolled in th				
Offer in 2012 - 2013	1st sem	Examination	Dec		
Offer in 2013 - 2014	Y				
Teaching Hours	The course consists of 36 lectures and 12 tutorials/example classes.				

Assessment Method	One 2-hour examination (75% weighting) and a coursework assessment (25% weighting) based on assignments, tutorial and a class test				
Course Grade	A+ to F				
Grade Descriptors	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.				
	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.				
	C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.				
	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.				
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.				
References	Rice, J. A.: Mathematical Statistics and Data Analysis (Duxbury, Belmont, California, 2nd ed.) Berry, D. A. & Lindgren, B. W.: Statistics: Theory and Methods (Duxbury, Belmont, 1996) Freund, J. E.: Mathematical Statistics (Prentice Hall, Englewood Cliffs, N. J., 1992) Hogg, R. V. & Tanis, E. A.: Probability and Statistical Inference (Prentice Hall, Upper Saddle River, N. J., 2001)				
Course Website	webct.hku.hk				
Remarks	<ol> <li>For students admitted in 2006 or before - AL PM or AS Math &amp; Stat or equivalent (Students taking or having taken STAT0301 or STAT0302 or STAT1306 or STAT1801 are not allowed to take this course)</li> <li>For students admitted in 2007 - AL PM or AS Math &amp; Stat or STAT0301 or STAT0302 or (students taking or having taken MATH0211). (Students taking or having taken STAT1306 or STAT1801 are not allowed to take this course.)</li> <li>For students admitted in 2008 or thereafter - AL PM or MATH0211. (Students taking or having taken STAT1801 are not allowed to take this course.)</li> </ol>				

STAT1302 Probabili	y and stat	istics II (6 credits)		Academic Year	2012
Offering Department	Statistics a	nd Actuarial Science		Quota	
Course Co-ordinator	Dr J F Yac	, Statistics and Actuarial Scien	ce		
Course Aim	two major modelling,	areas of statistical analysis: e inference and decision makin	ucing further the concepts and meth estimation and hypothesis testing. g, students will be equipped with b statistical analysis of real-life data.	Through the discipl	ines of statistica
Course Contents	<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>				
Learning Outcomes	- appreher - relate a r - conduct	eal-life problem to a formal fran tandard parametric statistical in	students should be able to: d its relation to probability theory; nework for statistical inference; nference by means of estimation and ics in a broad range of subject areas		;
Pre-requisites	Pass in ST	AT1301			
Offer in 2012 - 2013	2nd sem			Examination	Мау
Offer in 2013 - 2014	Y				
Feaching Hours	The cours	e consists of 36 lectures and 12	2 tutorials/example classes.		
Assessment Method		r examination (75% weighting) d a class test	and a coursework assessment (25	% weighting) based	l on assignments
Course Grade	A+ to F				
Grade Descriptors	A	learning outcomes. Show strong and	an advanced level of extensive knowledge a alytical and critical abilities and logical thinkin e of complex, familiar and unfamiliar situatio	g, with evidence of origin	al thought, and ability
		presentational skills.			-
	В	Demonstrate substantial command learning outcomes. Show evidence	of a broad range of knowledge and skills rec of analytical and critical abilities and logica ns. Apply effective organizational and presen	al thinking, and ability to	
	B C	Demonstrate substantial command learning outcomes. Show evidence familiar and some unfamiliar situatio Demonstrate general but incomplet outcomes. Show evidence of some	of analytical and critical abilities and logical	al thinking, and ability to tational skills. ed for attaining most of nking, and ability to app	apply knowledge to the course learning
		Demonstrate substantial command learning outcomes. Show evidence familiar and some unfamiliar situatio Demonstrate general but incomplet outcomes. Show evidence of some familiar situations. Apply moderately Demonstrate partial but limited com Show evidence of some coherent a	of analytical and critical abilities and logica ns. Apply effective organizational and presen te command of knowledge and skills requir analytical and critical abilities and logical thi	a) thinking, and ability to tational skills. ed for attaining most of nking, and ability to appi kills. aining some of the cours al and critical abilities. S	apply knowledge to the course learning y knowledge to most e learning outcomes, how limited ability to

	Fail         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.
References	<ul> <li>Berry, D.A. &amp; Lindgren, B.W. (1996). Statistics: Theory and Methods. Duxbury: Belmont.</li> <li>Bickel, P.J. &amp; Doksum, K.A. (2001). Mathematical Statistics: Basic Ideas and Selected Topics. Prentice Hall: Upper Saddle River, N.J.</li> <li>Hogg, R.V. &amp; Craig, A.T. (1989). Introduction to Mathematical Statistics. Macmillan: New York.</li> <li>Miller, I. &amp; Miller, M. (2004). John E. Freund's Mathematical Statistics with Applications. Pearson Prentice Hall: Upper Saddle River.</li> </ul>
Course Website	webct.hku.hk

STAT1303 Data man		••••••		2012	
Offering Department	Statistics a	and Actuarial Science	Quota		
Course Co-ordinator	Dr C W Kw	van, Statistics and Actuarial Science			
Course Aim	elementary different da	se is designed for students who want to learn a statistical softw y data analysis. This course focuses on using SAS to manage ata types, manipulate and transform data, perform random samp mmary reports and graphics.	data set input and	output, work with	
Course Contents	topics, inc manipulation	agement system for statistical projects. Data validation and cle cluding the following: Data set input and output. Workin on. Data transformation. File manipulation. File manageme on and graphics. Basic data analysis.	g with different d	ata types. Data	
Learning Outcomes	<ul> <li>access or</li> <li>use Data</li> <li>summariz</li> <li>work with</li> <li>perform of</li> <li>work with</li> <li>restructur</li> <li>subset ar</li> <li>present d</li> <li>produce h</li> </ul>	sful completion of the course, students should be able to nline help and document Step to create data files ze data by PROC MEANS, PROC FREQ, and PROC UNIVARIAT o numeric, character, and date variables and functions in Data Step conditional processing in Data Step terative processing in Data Step o arrays in Data step re SAS data sets by Data Step and PROC TRANSPOSE and merge data sets by Data Step and PROC APPEND lata in a readable way by PROC TABULATE high-resolution graphics by PROC SGPLOT HTML output by ODS			
Pre-requisites	Pass or a	e in HKCEE Math or AS Math & Stat or AL PM); and Iready enrolled in any of the following courses: BIOL1608 of 2, STAT1301, STAT1306, STAT1801	r BIOL2608, ECON1	003, STAT0301	
Offer in 2012 - 2013	1st sem	2nd sem	Examination	Dec May	
Offer in 2013 - 2014	Y				
Teaching Hours	The course	e consists of 36 lectures and 12 tutorials/example classes.			
Assessment Method		rr examination (60% weighting) and a coursework assessment (4 nd class test(s)	10% weighting) based	d on assignments	
Course Grade	A+ to F				
Grade Descriptors	А	Demonstrate thorough mastery at an advanced level of extensive knowledge learning outcomes. Show strong analytical and critical abilities and logical think to apply knowledge to a wide range of complex, familiar and unfamiliar situa presentational skills.	ing, with evidence of origir	al thought, and ability	
	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.				
	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		ry little or no ability to app		
References	Fail         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.           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)				
		by Step Programming with Base SAS Software (North Carolina:	SAS Publishing 2001	)	

STAT1304 Design an	d analysis of sample surveys (6 credits)	Academic Year	2012
Offering Department	Statistics and Actuarial Science	Quota	

Course Co-ordinator	Ms O T K C	Choi, Statistics and Actuarial Science				
Course Aim	both in the overall survision scheduling	sample surveys as a means to collect raw data for the c public and private sectors. The conduct of sample survivey design, design of sampling schemes and questionnair , and implementation of surveys. The course provides a ation and analysis of results of sample surveys and due deta	eys involves a range of a res, planning of fieldwork, general overview of the p	ctivities, including logistical matters,		
Course Contents	survey proc the survey survey app random sa	he course will discuss various sources of raw data and provide a general overview of the main aspects of the urvey process. Some emphasis will put on how to implement a good quality and trustworthy survey conducted by re survey organization. An introduction will be given to commonly used statistics that are produced through the urvey approach. Survey sampling will be covered in considerable detail. Topics taught will include: simple andom sampling; systematic sampling; stratified sampling; cluster sampling; multi-stage sampling; post- tratification; double sampling; estimation methods ;biases and non-sampling errors; non-responses; and missing ata.				
Learning Outcomes	<ul> <li>have a ge</li> <li>demonstration</li> <li>of sample s</li> <li>design dif</li> <li>make state</li> </ul>	sful completion of the course, students should be able to: eneral grasp of the ethical, technical and administrative issue ate knowledge and understanding of the various steps to b surveys ferent sample schemes and select the most efficient and su istical inference on parameters based on sample statistics ether the statistics presented by other survey takers are true	be taken in the planning a	nd implementation		
Pre-requisites	Pass or al	e in HKCEE Math or AS Math & Stat or AL PM); and Iready enrolled in any of the following courses: BIOL16 , STAT1301, STAT1306, STAT1801	08 or BIOL2608, ECON	1003, STAT0301,		
Offer in 2012 - 2013	2nd sem		Examination	May		
Offer in 2013 - 2014	Y					
Teaching Hours	The course	consists of 36 lectures and 12 tutorials/example classes.				
Assessment Method	One 2-hour tutorials, ar	r examination (75% weighting) and a coursework assessm	ent (25% weighting) base	d on assignments,		
Course Grade	A+ to F					
Grade Descriptors	A	Demonstrate thorough mastery at an advanced level of extensive kno learning outcomes. Show strong analytical and critical abilities and logic to apply knowledge to a wide range of complex, familiar and unfamilia presentational skills.	al thinking, with evidence of origir	nal thought, and ability		
	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.					
	С	Demonstrate general but incomplete command of knowledge and ski outcomes. Show evidence of some analytical and critical abilities and la familiar situations. Apply moderately effective organizational and presen	ogical thinking, and ability to app			
	D	Demonstrate partial but limited command of knowledge and skills requir Show evidence of some coherent and logical thinking, but with limited apply knowledge to solve problems. Apply limited or barely effective org:	analytical and critical abilities.	Show limited ability to		
	Fail	Demonstrate little or no evidence of command of knowledge and skills Lack of analytical and critical abilities, logical and coherent thinking. Sh problems. Organization and presentational skills are minimally effective	now very little or no ability to app			
References	S. L. Lohr: L. Kish: Su P. Salant &	affer, W. Mendenhall, & R. L. Ott: Elementary Survey Samp Sampling: Design and Analysis (Duxbury Press, 1996) rvey Sampling (John Wiley & Sons, Inc., 1995) . D. A. Dillman: How to Conduct Your Own Survey (John Wi aran: Sampling Techniques (John Wiley & Sons Ltd., 1997)		i, 5th edition)		
Course Website	webct.hku.	hk				
Remarks	Other refer	ences.				

STAT1306 Introduct	ory statistics (6 credits)	Academic Year	2012				
Offering Department	Statistics and Actuarial Science	Statistics and Actuarial Science Quota					
Course Co-ordinator	Dr E K F Lam, Statistics and Actuarial Science						
Course Aim	The discipline of statistics is concerned with situations involving uncertaint data needs special techniques when variability plays a role, as it usually do descriptive and analytical tool of many scientific disciplines. Candidates with this course suitable, because the language of mathematics allows the sub economy and clarity.	es. Thus statistics for h a mathematical ba	orms an importan ckground will find				
Course Contents	Presentation of data, Variability and Uncertainty, Measures of Central Ten Probability Theory and Techniques, Random Variables and Probability D Estimation, Normal Sampling Theorem, Confidence Intervals, Hypotheses T Correlation.	istributions, Random	Samples, Point				
Learning Outcomes	On successful completion of the course, students should be able to: - compute different measures of central tendency and dispersion. - make use of the basic probability theory and techniques to solve practical p - know how to construct confidence intervals and use hypotheses testing to a - use linear regression and correlation methods to solve problems in environment.	carry out inference or					

Pre-requisites	(C or above (Pass in M (Pass in M (Pass in M (Pass in M Not for stud	e in AL PM or AS Math & Stat) or /e in AL Phys) or ATH0801) or ATH0802) or ATH0201, or already enrolled in this course) or ATH1804, or already enrolled in this course)); and dents who have passed or already enrolled in any of these courses , STAT0302, STAT1301, STAT1801	:			
Offer in 2012 - 2013	1st sem		Examination	Dec		
Offer in 2013 - 2014	Y					
Teaching Hours	The course	e consists of 36 lectures and 12 tutorials/example classes.				
Assessment Method	One 2-hou tutorials, a	r examination (75% weighting) and a coursework assessment (25 <sup>r</sup> nd a test	% weighting) based	I on assignments,		
Course Grade	A+ to F					
Grade Descriptors	A	Demonstrate thorough mastery at an advanced level of extensive knowledge a learning outcomes. Show strong analytical and critical abilities and logical thinking to apply knowledge to a wide range of complex, familiar and unfamiliar situation presentational skills.	, with evidence of origin	al thought, and ability		
	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 atta Show evidence of some coherent and logical thinking, but with limited analytica apply knowledge to solve problems. Apply limited or barely effective organizationa	al and critical abilities. S	how limited ability to		
	Fail	Demonstrate little or no evidence of command of knowledge and skills required Lack of analytical and critical abilities, logical and coherent thinking. Show very problems. Organization and presentational skills are minimally effective or ineffect	little or no ability to apply			
Textbooks	Miller, I. a 2004, 7th e	nd Miller, M.: John E. Freund's Mathematical Statistics with Appledition)	ications (Prentice F	Hall, New Jersey,		
References	Bluman, A edition)	and Farber, B.: Elementary Statistics - Picturing the World (Prentic . G.: Elementary Statistics - A Step by Step Approach (The McG F.: Elementary Statistics (Addiso Wesley Longman, Inc., 1998, 7th e	Graw-Hill Companie			
Course Website	webct.hku.	hk				
Remarks	Students w	ho intend to major in "Risk Management" or "Statistics" should take	e STAT1301 instead	d of this course.		
		ences: , T. H. and Wonnacott, R. J.: Introductory Statistics (Wiley, New Yo J. and Massey, Jr, F. J.: Introduction to Statistical Analysis (McGrav				

STAT1323 Introduct credits)	ion to demographic and socio-economic statistics (6	Academic Year	2012
Offering Department	Statistics and Actuarial Science	Quota	
Course Co-ordinator	Ms L M S Kwan, Statistics and Actuarial Science		
Course Aim	The course is an introduction to the basic methods for studying demograph provide quantitative information on population size and structure, as well as course aims at providing students with 1) basic knowledge including the methods and statistical indicators; and 2) skills in the statistical description and application to planning, policy-making and commercial endeavours.	major aspects of ci underlying principles	tizens' lives. The s of the pertinent
Course Contents	Population structure, fertility, mortality, migration, life tables, population proje Social statistics on education, health, housing, labour, and other social chara Economic statistics on national accounts, prices indices, trade statistics; Sources, theory and methods of official statistics; Examples would be especially drawn from Hong Kong, and Mainland China	acteristics;	
Learning Outcomes	On successful completion of the course, students should be able to: - Describe and interpret major official & other publicly disseminated socio-ec - Further appraise and analyse the socio-economic well-being of a territory and mainland China - Predict a future situation by assimilating and deriving from appropriate stat - Critically assess statistics reporting	with particular refere	
Pre-requisites	(E or above in HKCEE Math or AS Math & Stat or AL Pure Maths); and Pass or already enrolled in any of these courses: BIOL1608 or BIOL2608 STAT1301, STAT1306, STAT1801; and Not for students who have already passed in STAT1305 before.	, ECON1003, STAT	0301, STAT0302,
Offer in 2012 - 2013	2nd sem	Examination	Мау
Offer in 2013 - 2014	Υ		
Teaching Hours	The course consists of 36 lectures and 12 tutorials/example classes.		
Assessment Method	One 2-hour examination (75% weighting) and a coursework (25% weighting	) based on assignm	ents, tutorials and

	a test
Course Grade	A+ to F
Grade Descriptors	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.
	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.
	C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.
	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.
References	Annual Digest of Statistics (Census & Statistics Department, Hong Kong SAR, latest issue) (Main Reference) Giovannini E.: Understanding Economic Statistics - an OECD Perspective (OECD, 2008) Pollard A. H., Yusuf F., & Pollard G. N.: Demographic Techniques (Pergamon Press, 1990, 3rd edition) Preston S, Heuveline P, Guillot M: Demography: Measuring and Modelling Population Process (Wiley-Bladwell, 2000)
Course Website	webct.hku.hk

credits)	iy and stat	istics: foundations of actuarial science (6	Academic Year	2012			
Offering Department	Statistics a	nd Actuarial Science	Quota				
Course Co-ordinator	Dr Y K Chu	ung, Statistics and Actuarial Science					
Course Aim	quantitative	se of this course is to develop knowledge of the fundar ely assessing risk. Applications of these tools to d. Students will have a thorough command of probability to	actuarial science pro	blems will be			
Course Contents	<ul> <li>Basic ele</li> <li>Mutually de Addition a</li> <li>Independ</li> <li>Combinat</li> <li>Condition</li> <li>Bayes Th</li> <li>Random</li> <li>Univaria</li> <li>Univaria</li> <li>Univaria</li> <li>Univaria</li> <li>Univaria</li> <li>Univaria</li> <li>Univaria</li> <li>Mode, me</li> <li>Variance</li> <li>Central L</li> </ul>	te probability distributions (including binomial, negative bin xponential, chi-square, beta, Pareto, lognormal, gamma,					
earning Outcomes	<ul> <li>understar</li> <li>develop s</li> </ul>	sful completion of the course, students should be able to: nd the mathematical theory underlying the modern practice kills in probabilistic analysis for problems involving random nniques in probability and statistics to solve actuarial science	ness				
Pre-requisites		e in AL Pure Math or AS Math & Stat; or (Pass in MATH181 udents who have passed or enrolled in any of these co					
Offer in 2012 - 2013	1st sem		Examination	Dec			
Offer in 2013 - 2014	Y						
eaching Hours	The course	e consists of 36 lectures and 12 tutorials/example classes.					
Assessment Method		rr written examination (75% weighting) and a coursewo ts, tutorials, and a class test	rk assessment (25% we	ighting) based o			
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.
Textbooks	I. Miller & 2004, 7th e	M. Miller: John E. Freund's Mathematical Statistics with applications (Pearson Education International, edition)
References	(Brooks/Co S. Ghahra M. Hassett	n: Probability: The Science of Uncertainty with Applications to Investments, Insurance, and Engineering ole, Thomas Learning) mani: Fundamentals of Probability, with Stochastic Processes (2005, 3rd edition) t & D. Stewart: Probability for Risk Management (2006, 2nd edition) s: A First Course in Probability (2005, 7th edition)
Course Website	webct.hku	hk
Remarks	Other Refe 7th edition	erences: D. Wackerly, W. Mendenhall III & R. Scheaffer: Mathematical Statistics with Applications (2008, )

STAT1802 Financial	mathemat	atics	s (6 credits	5)				Academic Year	2012
Offering Department	Statistics a	s and A	Actuarial So	ience				Quota	
Course Co-ordinator	Prof K C Y	Yuen	n, Statistics	and Actuaria	I Science				
Course Aim		This course introduces the fundamental concepts of financial mathematics which plays an important role in the levelopment of basic actuarial techniques. Practical applications of these concepts are also covered.							
Course Contents	amortizatio mortgage	Ley topics include: measurement of interest, annuities certain; discounted cash flow analysis; yield rates; mortization schedules and sinking funds; bonds and related securities; practical applications such as real estate nortgage and short sales; stochastic approaches to interest; and key terms of financial analysis such as yield urves, spot rates, forward rates, duration, convexity, and immunization.							
Learning Outcomes	<ul> <li>understar</li> <li>learn star</li> <li>do simple</li> <li>learn the sales, and</li> <li>quote interview</li> </ul>	n successful completion of the course, students should be able to: understand the fundamental concepts of financial mathematics. learn standard actuarial notations for a variety of annuities. do simple discounted cashflow analysis using basic annuities. learn the operations of some commonly-encountered financial instruments such as bonds, mortgages, short ales, and so on. quote interest in various modes and determine interest rate based on a series of financial transactions. deal with Exam FM of the Society of Actuaries.							
Pre-requisites	(Pass in S Pass in ST	E or above in AL Pure Math or AS Math & Stat); and Pass in STAT1302, or already enrolled in this course; or Pass in STAT1801, or already enrolled in this course); and Not for students who have passed in STAT2315, or have already enrolled in this course.							
Offer in 2012 - 2013	2nd sem	۱						Examination	Мау
Offer in 2013 - 2014	Y								
Teaching Hours	The course	rse coi	onsists of 36	lectures and	d 12 tutorials/e	xample classe	s.		
Assessment Method			written exar tutorials and		% weighting)	and a course	ework asse	ssment (25% weig	hting) based or
Course Grade	A+ to F								
Grade Descriptors	A	lea to	earning outcom	es. Show strong	analytical and cr	itical abilities and	logical thinking	nd skills required for att I, with evidence of origin ns. Apply highly effectiv	al thought, and ability
	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.								
	С	ou	utcomes. Show	evidence of so	me analytical an		and logical thir	ed for attaining most of hking, and ability to appl kills.	
	D	Sh	show evidence	of some cohere	ent and logical th	nking, but with lir	nited analytica	aining some of the cours I and critical abilities. S I and presentational skil	how limited ability to
	Fail	La	ack of analytica	I and critical at	pilities, logical and	f knowledge and coherent thinkin are minimally effec	g. Show very I	for attaining the course ittle or no ability to applive.	e learning outcomes. y knowledge to solve
Textbooks	Kellison, S	, S. G.:	.: The Theo	y of Interest	(Irwin: Illinois	2008, 3rd edi	tion)		
References	Brovermar 2004, 3rd e			matics of Inv	vestment and	Credit (ACTE	X Publicatio	ns - Mad River Bo	oks: Connecticu
Course Website	webct.hku.	ku.hk							

STAT2301 Linear statistical analysis (6 credits) Acad			2012
Offering Department	Statistics and Actuarial Science	Quota	
Course Co-ordinator	Prof T W K Fung, Statistics and Actuarial Science		

Course Aim	techniques	sis of variability is mainly concerned with locating t investigate these sources through the use of 'linear' these models.		
Course Contents	tests and c (2) Multiple full models (3) One-wa (4) Two-w treatment e (5) Univers and two-wa (6) Regres observation (7) Genera	linear regression: least squares method, analysis of v confidence intervals for regression parameters, predictio a linear regression: least squares method, analysis of v ay classification models: one-way ANOVA, analysis of tr ay classification models: interactions, two-way ANO effects, contrasts, randomised complete block design. cal approach to linear modelling: dummy variables, 'mult ay (unbalanced) models, ANCOVA models, concomitant sion diagnostics: leverage, residual plot, normal probat n, Cook's distance, multicollinearity, model fitting s, logistic regression, Poisson data, multinomial respons	n. ariance, coefficient of determi in parameters, prediction, poly eatment effects, contrasts. VA for balanced data struct tiple linear regression' represe t variables. bility plot, outlier, studentized i on. , analysis of deviance, analy	nation, reduced vs nomial regression. ures, analysis of ntation of one-way residual, influential
Learning Outcomes	- Understa - Understa	sful completion of the course, students should be able to nd linear regression model with one or multiple indepen- nd ANOVA models for one and two factors. nd general linear model with categorical and continuous	dent variables.	
Pre-requisites		AT1302; and dents who have passed in STAT2804, or have already e	enrolled in this course.	
Offer in 2012 - 2013	1st sem		Examination	Dec
Offer in 2013 - 2014	Y			
Teaching Hours	The course	e consists of 36 lectures and 12 tutorials/example classe	9S.	
Assessment Method		r examination (75% weighting) and a coursework asse d a class test	ssment (25% weighting) base	d on assignments,
Course Grade	A+ to F			
Grade Descriptors	A	Demonstrate thorough mastery at an advanced level of extensive learning outcomes. Show strong analytical and critical abilities and to apply knowledge to a wide range of complex, familiar and unfa presentational skills.	logical thinking, with evidence of origin	nal thought, and ability
	В	Demonstrate substantial command of a broad range of knowledge learning outcomes. Show evidence of analytical and critical abilit familiar and some unfamiliar situations. Apply effective organization	ies and logical thinking, and ability t	
	С	Demonstrate general but incomplete command of knowledge an outcomes. Show evidence of some analytical and critical abilities a familiar situations. Apply moderately effective organizational and pr	and logical thinking, and ability to app	
	D	Demonstrate partial but limited command of knowledge and skills r Show evidence of some coherent and logical thinking, but with lir apply knowledge to solve problems. Apply limited or barely effective	mited analytical and critical abilities.	Show limited ability to
	Fail	Demonstrate little or no evidence of command of knowledge and Lack of analytical and critical abilities, logical and coherent thinkin problems. Organization and presentational skills are minimally effect	g. Show very little or no ability to app	
Textbooks	Michael H Hill/Irwin; 5	Kutner, Christopher J. Nachtsheim, John Neter, Williar ith edition)	m Li: Applied Linear Statistica	Models (McGraw-
References	Draper, N. Krzanowsk	A. & Lindgren, B. W.: Statistics: Theory and Methods (Du R. & Smith, H.: Applied Regression Analysis (Wiley, Ne ki, W. J.: An Introduction to Statistical Modelling (Arnold, ry, D. C. & Peck, E. A.: Introduction to Linear Regressio	w York, 1998) London, 1998)	1992)
Course Website	webct.hku.	· · ·	· · · ·	

STAT2302 Statistica	I inference (6 credits)	Academic Year	2012
Offering Department	Statistics and Actuarial Science	Quota	
Course Co-ordinator	Prof S M S Lee, Statistics and Actuarial Science		
Course Aim	This course covers the advanced theory of point estimation, interval estima mathematically-oriented approach, the course provides a solid and rigorou statistical methodologies and the underlying concepts and theory. It is suitable to further their studies or to develop a career in statistical research.	us treatment of infe	rential problems,
Course Contents	<ol> <li>Paradigms of inference: frequentist, Bayesian, Fisherian.</li> <li>Decision theory: loss function; risk; decision rule; admissibility; minimaxity;</li> <li>Estimation theory: exponential families; likelihood; sufficiency; minimal s</li> <li>UMVU estimators; information inequality; large-sample theory of maximum lik</li> <li>Hypothesis testing: uniformly most powerful test; monotone likelihood ratio</li> </ol>	sufficiency; ancillarit elihood estimation.	
	maximal invariants; most powerful invariant test; large-sample theory of likelih		MP unbiased test
Learning Outcomes		lood ratio.	MP unbiased test;
Learning Outcomes Pre-requisites	maximal invariants; most powerful invariant test; large-sample theory of likelih On successful completion of the course, students should be able to: - form a panoramic view of classical developments in mathematical statistics; - gain thorough insight into the essentials of statistical inference;	lood ratio.	MP unbiased test;
	<ul> <li>maximal invariants; most powerful invariant test; large-sample theory of likelih</li> <li>On successful completion of the course, students should be able to:</li> <li>form a panoramic view of classical developments in mathematical statistics;</li> <li>gain thorough insight into the essentials of statistical inference;</li> <li>build a solid foundation for future research studies in statistics and related and</li> </ul>	lood ratio.	MP unbiased test

Teaching Hours	The course consists of 36 lectures and 12 tutorials/example classes.						
Assessment Method	One 2-hour examination (75% weighting) and a coursework assessment (25% weighting) based on assignments, tutorials and a class test						
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. 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.						
References	<ul> <li>Berry, D. A. &amp; Lindgren, B. W.: Statistics: Theory and Methods (Duxbury, Belmont, 1996)</li> <li>Bickel, P. J. &amp; Doksum, K. A.: Mathematical Statistics: Basic Ideas and Selected Topics, Vol. 1 (Prentice Hall, Upper Saddle River, N.J., 2001)</li> <li>Freund, J. E.: Mathematical Statistics (Prentice Hall, Englewood Cliffs, N.J., 1992)</li> <li>Hogg, R. V. &amp; Craig, A. T.: Introduction to Mathematical Statistics (Macmillan, New York, 1989)</li> <li>Pace, L. &amp; Salvan, A.: Principles of Statistical Inference: from a neo-Fisherian perspective (World Scientific: Singapore, 1997).</li> <li>Young, G.A. &amp; Smith, R.L.: Essentials of Statistical Inference (Cambridge University Press: Cambridge, 2005).</li> </ul>						
Course Website	webct.hku.hk						

STAT2303 Probabili	ty modelli	ling (6	credits)		Academic Year	2012	
Offering Department	Statistics a	s and Ac	ctuarial Science			Quota	
Course Co-ordinator	Dr K S Chong, Statistics and Actuarial Science						
Course Aim	This is an discussed		luctory course in p	probability modelling.	A range of important t	topics in stochastic	processes will b
Course Contents	classificati states, Po Brownian formula, C	Introduction to probability theory, conditional probability and expectation, Markov chains, random walk models, classification of states in a Markov chain, calculation of limiting probabilities and mean time spent in transient states, Poisson process, distribution of 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).					
Learning Outcomes	- apply the - understa	On successful completion of the course, students should be able to: - apply the conditioning method to calculate the mean and probability - understand the essentials of Markov chains, the Poisson process, and Brownian motion - understand how stochastic models can be applied to the study of real-life phenomena					
Pre-requisites	Not for stu	Pass in STAT1301; and Not for students who have passed in MATH2603, or have already enrolled in this course; and Not for students who have passed in STAT2803, or have already enrolled in this course.					
Offer in 2012 - 2013	1st sem					Examination	Dec
Offer in 2013 - 2014	Y						
Teaching Hours	The cours	rse cons	sists of 36 lectures	s and 12 tutorials/exa	ample classes.		
Assessment Method	One 2-hou and a clas			eighting) and a cours	sework assessment (25	% weighting) based	l on assignment
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.						
Textbooks	S. M. Ros	oss: Intro	oduction to Probal	bility Models (9th edit	tion)		
Course Website	webct.hku	ku hk					

STAT2304 Design ai	nd analysis	of experiments (6 credits)	Academic Year	2012				
Offering Department	Statistics a	nd Actuarial Science	Quota					
Course Co-ordinator	Dr G Li, Sta	Dr G Li, Statistics and Actuarial Science						
Course Aim	basic princ	esearch often requires proper design and analysis ples of experimental design; to explain the concepts experiment.						
Course Contents	randomise	Basic principles and guidelines for designing experiments. Analysis for experiments with a single factor, randomised block, crossed and nested factorial structure. Balanced incomplete factorial experiments. Latin squares and related designs. Fixed/random effects models.						
Learning Outcomes	<ul> <li>develop a</li> <li>acquire th</li> <li>select approximation</li> </ul>	n successful completion of the course, students should be able to: levelop a conceptual understanding of experimental design, loquire the fundamental statistical tools of experimental design and the understanding to use them appropriate lelect appropriate experimental designs for different problems, lelect appropriate statistical model and to know how to validate the model.						
Pre-requisites	Pass in ST	AT1302 or STAT2802 or STAT2311						
Offer in 2012 - 2013	2nd sem		Examination	May				
Offer in 2013 - 2014	Y							
Teaching Hours	The course	consists of 36 lectures and 12 tutorials/example cla	SSES.					
Assessment Method	One 2-hou and a class	examination (75% weighting) and a coursework a test	ssessment (25% weighting) bas	ed on assignments				
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 cours learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge t 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 learnin outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to more 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 Lack of analytical and critical abilities, logical and coherent this problems. Organization and presentational skills are minimally of	nking. Show very little or no ability to ap					
Textbooks	D. C. Mont	omery: Design and Analysis of Experiments (Wiley	, 1997, 4th edition)					
References	A. L. Edwa G. A. Fergu C. R. Hicks P. W. M. Jo	<ul> <li>D. C. Montgomery: Design and Analysis of Experiments (Wiley, 1997, 4th edition)</li> <li>D. R. Cox: Planning of Experiments (Wiley, 1958)</li> <li>A. L. Edwards: Experimental Design in Psychological Research (Harper &amp; Row, 1985, 5th edition)</li> <li>G. A. Ferguson &amp; Y. Takane: Statistical Analysis in Psychology and Education (McGraw Hill, 1989, 6th edition)</li> <li>C. R. Hicks &amp; K. V. Turner Jr.: Fundamental Concepts in the Design of Experiments (Oxford, 1999, 5th edition)</li> <li>P. W. M. John: Statistical Design and Analysis of Experiments (Macmillan, 1971)</li> <li>R. L. Moson, R. F. Gungst, &amp; J. L. Hess: Statistical Design and Analysis of Experiments (Wiley, 1989)</li> </ul>						
Course Website	webct.hku.							

STAT2305 Quality control and management (6 credits) Academic Year 2012							
Offering Department	Statistics and Actuarial Science	Quota					
Course Co-ordinator	Dr K S Chong, Statistics and Actuarial Science						
Course Aim	The successful control of quality in production is a matter of primary importance to a company's prosperity. This course provides an overview of quality compromise which involves both the producer and the consumer. It presents a variety of statistical solutions including control charts, acceptance and sequential sampling plans, reliability, and life-testing. Contemporary quality management systems such as total quality control, zero defects, six-sigma, and ISO-9000 will be introduced. The student is brought to the frontier of today's quality control and management ideas.						
Course Contents	Probability distributions and their applications, process variability, sampling and statistical inference. Process control, variables and attributes control charts. Operating characteristic curves. Single, double and sequential sampling plans. MIL-STD-105D and Dodge-Romig schemes. Variables sampling. Reliability and life-testing. Elementary experimental designs. Management of quality control, total quality control, zero defects, six-signa, and ISO 9000.						
Learning Outcomes	On successful completion of the course, students should be able to: - Appreciate the practicality of statistical concepts and methods in general; - Understand how certain specific statistical methods can benefit various production situations; - Know the traditional and modern systems of quality management.						
Pre-requisites	Pass in BIOL1608 or BIOL2608 or ECON1003 or STAT0301 or STAT0 STAT1801 or STAT2802	302 or STAT1301 (	or STAT1306 or				
Offer in 2012 - 2013	2nd sem	Examination	May				
Offer in 2013 - 2014	Y						

Teaching Hours	The course consists of 36 lectures and 12 tutorials/example classes.						
Assessment Method	One 2-hour written examination (75% weighting) and a coursework assessment (25% weighting) based on assignments and a class test						
Course Grade	A+ to F						
Grade Descriptors	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.						
	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.						
	C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.						
	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.						
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.						
References	<ul> <li>A. J. Duncan: Quality Control and Industrial Statistics (Irwin, Homewoor, 1986, 5th edition)</li> <li>D. C. Montgomery: Statistical Quality Control (New York: Wiley, 1996, 3rd edition)</li> <li>J. Banks: Principles of Quality Control (New York: Wiley, 1989)</li> <li>E. L. Grant &amp; R. S. Leavenworth: Statistical Quality Control (New York: McGraw-Hill, 1988, 6th edition)</li> <li>I. D. Hill: An Introduction to Sampling Inspection (The Institute of Engineering Inspection Monograph, London 1961)</li> <li>G. B. Wetherill: Sampling Inspection and Quality Control (London: Methuen, 1977, 2nd edition)</li> <li>A. V. Feigenbaum: Total Quality Control (New York: McGraw-Hill, 1983, 3rd edition)</li> </ul>						
Course Website	webct.hku.hk						

STAT2306 Business	s logistics	s (6 crea	dits)		Academic Year	2012			
Offering Department	Statistics	s and Act	uarial Science		Quota				
Course Co-ordinator	Ms O T K	Ms O T K Choi, Statistics and Actuarial Science							
Course Aim	budgeting	Modern business corporations are increasingly using logistics as a management tool, for example, in capital budgeting problems, production planning, scheduling, transportations and deciding a location for a new factory. This course addresses the business applications of logistics.							
Course Contents	logistic pr	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.							
Learning Outcomes	- Solve lin - Set-up a - Understa	On successful completion of the course, students should be able to: Solve linear programming with Graphical approach, Simplex method and hands-on Excel Solving function Set-up and solve network flow problems using least-cost approach, MODI method and Vogel's approximation Understand decision theory and its applications Evaluate the cost and effectiveness of service systems							
Pre-requisites	STAT180	301; and		ECON1003 or STAT0301 ATH2901, or have already e			or STAT1306 or		
Offer in 2012 - 2013	1st sem	1				Examination	Dec		
Offer in 2013 - 2014	Y								
Teaching Hours	The cours	urse consis	sts of 36 lectures an	d 12 tutorials/example class	ses.				
Assessment Method	One 2-ho a class te		ination (75% weight	ting) and a coursework (25	% weighting)	based on assignm	ents, tutorials and		
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	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	Lack c	of analytical and critical a	nce of command of knowledge ar ibilities, logical and coherent think esentational skills are minimally eff	ing. Show very	little or no ability to appl			
References	Wayne L. H. Taha: /	problems. Organization and presentational skills are minimally effective or ineffective.         B. Render, R. Stair, M. Hanna: Quantitative Analysis for Management, 10th edition, Pearson         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	webct.hku.hk

STAT2307 Statistics credits)	s in clinical medicine and bio-medical research (6				Academic Year	2012	
Offering Department	Statistics	s and Actu	arial Science		Quota		
Course Co-ordinator	Dr G Yin,	Dr G Yin, Statistics and Actuarial Science					
Course Aim	the clinica designs. size and p	In clinical research, medical data are often observed which motivates the application of statistical methodology to the clinical observational and decision-making process. Also, statistical problems often arise from clinical tria designs. It involves phase I, II, III and IV clinical trial designs, both Bayesian and frequentist approaches, sample size and power calculation. No knowledge in biology or medicine is assumed; the course provides the necessar biomedical background when the statistical problems are introduced.					
Course Contents	analysis,	, Bayesia		ncy tables, regression models nods, sample size and powe			
Learning Outcomes	<ul> <li>understar</li> <li>design c</li> <li>conduct</li> </ul>	On successful completion of the course, students should be able to: understand the basic concepts in medical statistics design clinical trials and compute sample sizes conduct statistical inference and apply regression models solve medical problems by using various statistical tests					
Pre-requisites	Pass in S	STAT130	or STAT2802				
Offer in 2012 - 2013	2nd sem	1			Examination	May	
Offer in 2013 - 2014	Y						
Teaching Hours	The cours	rse consis	ts of 36 lectures and 12 tutori	als/example classes.			
Assessment Method	One 2-ho tutorials a			a coursework assessment (25	% weighting) based	d on assignment	
Course Grade	A+ to F						
Grade Descriptors	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.						
	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.						
	C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.						
	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.						
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.						
References	<ul> <li>J. Aitchison, J. W. Kay &amp; I. J. Lauder: Statistical Concepts and Applications in Clinical Medicine (Chapman Hall/CRC, 2004)</li> <li>J. Aitchison &amp; J. Dunsmore: Statistical Prediction Analysis (Cambridge University Press, 1976)</li> <li>P. Armitage: Statistical Methods in Medical Research (Oxford: Blackwell, 1971)</li> <li>P. Armitage: Sequential Medical Trials (Oxford: Blackwell, 1975, 2nd edition)</li> <li>D. Altman: Practical Statistics for Medical Research (London: Chapman &amp; Hall, 1991)</li> <li>N. E. Breslow &amp; N. E. Day: Statistical Methods in Cancer Research Volume 1 - The analysis of case-controstudies (Lyon: IARC, 1980)</li> <li>D. R. Cox &amp; E. J. Snell: The Analysis of Binary Data (London: Chapman and Hall, 1989, 2nd edition)</li> <li>D. R. Cox &amp; D. V. Hinkley: Theoretical Statistics (London: Chapman and Hall, 1974)</li> </ul>						
Course Website	webct.hku	ku.hk					
Remarks	B. Jones a B. J. T. M S. J. Poco	arris & A. A s & M. G. I Morgan: A cock: Clini	Kenward: Design and Analysi nalysis of Quantal Response cal Trials. A Practical Approa	or Clinical Studies (New York: s of Cross-Over Trials (Londo Data (London: Chapman and ach (Chickestes: John Wiley & r Models (London: Chapman	n: Chapman and Ha Hall, 1992) Sons, 1991)	ıll, 1990)	

STAT2308 Statistica	Academic Year	2012				
Offering Department	Statistics and Actuarial Science Quota					
Course Co-ordinator	Prof T W K Fung, Statistics and Actuarial Science					
Course Aim	This course aims to provide students with a fundamental knowledge of DNA profiling in human identification and genetic epidemiology in gene mapping and to understand how statistical theory and methods are applied to solve forensic DNA and genetic problems.					
Course Contents	This course will cover the following topics: background of genetics; Mendelian inheritance; Hardy-Weinberg equilibrium; linkage equilibrium; chi-square test; likelihood ratio test; exact test; match probability; paternity testing					
	107					

	and kinship analysis; DNA mixed stain; relatedness; population structure; gene mapping; parametric linkage analysis; non-parametric linkage analysis; linkage disequilibrium; association designs; case-control analysis; family based association study; quantitative traits.							
Learning Outcomes	- understa - know th	On successful completion of the course, students should be able to: - understand the fundamental principles in statistical DNA forensics and genetic epidemiology - know the usefulness and possible limitations of statistical methodology in human identification and gene mapping - provide statistical solutions to specific problems in the field						
Pre-requisites	Pass in S	STAT1302 or ST	FAT2802					
Offer in 2012 - 2013	2nd sem					Examination	Мау	
Offer in 2013 - 2014	Y							
Teaching Hours	The cours	se consists of 3	6 lectures and 1	2 tutorials/example	classes.			
Assessment Method		our examination and a class test		) and a coursework	assessment (259	% weighting) base	d on assignments,	
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.						
	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.							
References	Klug, W. S. and Cummings, M. R.: Essentials of Genetics (Prentice Hall, 2002) Ott, J.: Analysis of Human Genetic Linkage (The Johns Hopkins University Press, 1999, 3rd ed.) Ziegler, A. and Konig, I.R.: A Statistical Approach to Genetic Epidemiology (Wiley-VCH, 2006) Evett, I. W. and Weir, B. S.: Interpreting DNA Evidence (Sinauer Associates, Inc. Publishers, 1998) Fung, W. K. and Hu, Y. Q.: Statistical DNA Forensics: Theory, Methods and Computation (Wiley, Sussex, 2008)							
Course Website	webct.hki	u.hk					-	

	stics of inv	estment ris	sk (6 credits)			Academic Year	2012			
Offering Department	Statistics a	and Actuarial	Science			Quota				
Course Co-ordinator	Mr K P Wat, Statistics and Actuarial Science									
Course Aim	uncertainty rational fra interest rat	Most investments involve some risk. The decision to invest or not is usually made against a background of uncertainty. Whilst prediction of the future is difficult, there are statistical modelling techniques which provide a rational framework for investment decisions, particularly those relating to stock markets and the markets for interest rates, commodities and currencies. Building upon research, both in Hong Kong and abroad, this course presents the prevailing statistical theories for prices and price-change in these vital markets.								
Course Contents				iance portfolio th , behavioural fina	eory, capital asset pr nce.	icing model, arbitra	ge pricing theory			
Learning Outcomes	<ul> <li>measure</li> <li>apply different of the second s</li></ul>	On successful completion of the course, students should be able to: - measure risk and return of portfolios; - apply different approaches in constructing optimal investment portfolios; - explain and apply asset pricing models and evaluate investment performance; - explain the concepts of market efficiency and apply appropriate testing procedures to assess different forms of market efficiency.								
Pre-requisites	Pass in STAT1302 or STAT1306 or STAT2311 or STAT2314; and Not for students who have passed in FINA2802, or have already enrolled in this course. (Any student who has already passed in BIOL1608 or BIOL2608 or ECON1003 or STAT0301 or STAT0302 or STAT1301 or STAT1801 in 2009-10 or before can still apply for this course.) (Not available to Actuarial Science students)									
	(i tot availa	ible to Actual	iai Obicitioc Staa	51113)	1st sem Examination Dec					
Offer in 2012 - 2013	· ·			5110)		Examination	Dec			
Offer in 2012 - 2013 Offer in 2013 - 2014	· ·			5110)		Examination	Dec			
	1st sem Y			12 tutorials/exam	ple classes.	Examination	Dec			
Offer in 2013 - 2014	1st sem       Y       The course       One 2-hou	e consists of ur written ex	36 lectures and	12 tutorials/exam 6 weighting) an	ple classes. d coursework asses					
Offer in 2013 - 2014 Teaching Hours	1st sem       Y       The course       One 2-hou	e consists of ur written ex	36 lectures and xamination (70%	12 tutorials/exam 6 weighting) an	•					
Offer in 2013 - 2014 Teaching Hours Assessment Method	1st sem Y The course One 2-hou assignmen	e consists of ur written ex its, tutorials a Demonstrate learning outco	36 lectures and xamination (70% and class test(s). thorough mastery a ownes. Show strong a vledge to a wide rar	12 tutorials/exam 6 weighting) an t an advanced level nalytical and critical	•	sment (30% weigh	nting) based or aining all the course			

	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.
References	<ul> <li>Z. Bodie, A. Kane &amp; A. J. Marcus: Investments and Portfolio Management (McGraw-Hill, 2011, 9th edition)</li> <li>E. J. Elton, M. J. Gruber, S. J. Brown &amp; W. N. Goetzmann: Modern Portfolio Theory and Investment Analysis (John Wiley, 2011, 8th edition)</li> <li>R. A. Defusco, D. W. McLeavey, J. E. Pinto &amp; D. E. Runkle: Quantitative Investment Analysis, CFA Institute Investment Series (New Jersey: Wiley, 2007, 2nd edition)</li> <li>F. J. Fabozzi, S. M. Focardi &amp; P. N. Kolm: Financial Modelling of the Equity Market: From CAPM to Cointegration (New Jersey: Wiley, 2006)</li> <li>D. Ruppert: Statistics and Finance: An Introduction (New York: Springer, 2004)</li> <li>D. G. Luenberger: Investment Science (Oxford University Press, 1998)</li> </ul>
Course Website	webct.hku.hk
Remarks	References - Cont'd L. S. F. Young & R. C. P. Chiang: The Hong Kong Securities Industry (The Stock Exchange of Hong Kong, 1997, 3rd edition)

STATZSTU RISK IIIdi	agement	and insurance (6 credits	>)	Academic Year	2012				
Offering Department	Statistics	and Actuarial Science		Quota					
Course Co-ordinator	Dr R W L	Dr R W L Wong, Statistics and Actuarial Science							
Course Aim	products, technique minimal b	To provide knowledge on basic risk and its management, as well as basic financial planning though insurance products, to students. To allow students to understand the statistical, financial and legal principles underlying the techniques for managing the insurable risks faced by organisations and individuals. Aiming at students who have minimal background in quantitative methods, it involves very minimal quantitative calculations and is not available to students majoring in Actuarial Science.							
Course Contents	- risk in ou - insuranc - introduct - fundame - life insur	The course introduces and explains: risk in our society, insurance and risk, introduction to risk management, fundamental legal principles, and analysis of insurance contracts, life insurance, their contractual provisions, individual health insurance coverages.							
Learning Outcomes	<ul> <li>understa</li> <li>demons</li> <li>industry,</li> <li>understa</li> <li>compare</li> </ul>	On successful completion of the course, students should be able to: understand the general risks faced by organisations and individuals and the generic risk management principle, demonstrate knowledge and understanding of the underlying financial and legal principles of the insurance ndustry, understand how risk can be managed through insurance, compare and contrast different types of commercial and personal insurance products, plan for and arrange their own personal insurance needs.							
Pre-requisites	STAT180	Pass in BIOL1608 or BIOL2608 or ECON1003 or STAT0301 or STAT0302 or STAT1301 or STAT1306 or STAT1801. STAT1801. (Not available to Actuarial Science students)							
Offer in 2012 - 2013	2nd sem			Examination	May				
Offer in 2013 - 2014	Y								
Feaching Hours	The cours	e consists of 36 lectures and	12 tutorials/example classes.						
Assessment Method		ur examination (75% weightin nd a class test	ng) and a coursework assessmen	t (25% weighting) based	d on assignment				
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 outco Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to problems. Organization and presentational skills are minimally effective or ineffective.								
		problems: organization and pres	entational skills are minimally effective or i	neneclive.					
<b>Fextbooks</b>	Rejda, G.		entational skills are minimally effective or i ement and Insurance (Pearson Ac		on)				

	edition)	
Course Website	webct.hku.hk	

STAT2311 Compute	r-aided dat	ata ar	nalysis (6 cred	its)		Academic Year	2012	
Offering Department	Statistics a	and A	Actuarial Science			Quota		
Course Co-ordinator	Dr E K F L	Lam, S	Statistics and Act	uarial Science				
Course Aim	scientific s several v statistics. statistics.	A wide range of statistical analyses and methods are presented using data sets from social sciences research and scientific studies. Measuring uncertainty, describing patterns of variability and the inter-relationship between several variables are essential aspects of scientific investigations that require good understanding of statistics. This computer-oriented but non-mathematical course develops the important concepts and methods of statistics. The course makes extensive use of computers through the user friendly statistical software JMP. No knowledge of a programming language is required.						
Course Contents		Data exploration, formulation of testable hypotheses, the evaluation of evidence and forecasting on the basis of ast experience.						
Learning Outcomes	- summariz - describe - carry ou	rize an e the p out sin	nd describe the qu patterns of variabil mple statistical a	ity and the inter-relat nalyses based on s	uld be able to: tive data using some sir ionship between severa some real life data, fo ions on the findings.	I continuous or discr	ete variables,	
Pre-requisites	Not for stu Not for stu	tudents tudents	ts who have passe ts who have passe	d in STAT1301, or h d in STAT1801, or h	T0301 or STAT0302 or ave already enrolled in t ave already enrolled in t ave already enrolled in t	his course; and his course; and		
Offer in 2012 - 2013	1st sem					Examination	Dec	
Offer in 2013 - 2014	Y							
Teaching Hours	The course	rse con	nsists of 36 lecture	s and 12 tutorials/ex	ample classes.			
Assessment Method			amination (60% w and a term test	eighting) and a cour	sework assessment (40	% weighting) based	on assignments	
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	lear fam	arning outcomes. Show miliar and some unfami	v evidence of analytical a liar situations. Apply effect	ind critical abilities and logica- tive organizational and present f knowledge and skills requir	al thinking, and ability to tational skills.	apply knowledge to	
	С	oute	tcomes. Show evidence	e of some analytical and	critical abilities and logical thi izational and presentational s	nking, and ability to apply		
	D	Sho	now evidence of some	coherent and logical thin	edge and skills required for att king, but with limited analytic r barely effective organization	al and critical abilities. S	now limited ability to	
	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.							
Textbooks	G. C. Can	navos	s & D. M. Miller: Ar	Introduction to Mode	ern Business Statistics (	Duxbury Press, 1999	9, 2nd edition)	
References	J. E. Freur R. Hooke: D. G. Klei (Duxbury F	<ul> <li>E. R. Babbie: The Practice of Social Research (Wadsworth Pub. Co., Belmont, 7th edition)</li> <li>J. E. Freund &amp; G. A. Simon: Statistics - A First Course (Prentice Hall, 7th edition)</li> <li>R. Hooke: How to tell the liars from the Statisticians (Marcel Dekker)</li> <li>D. G. Kleinbaum, L. L. Kupper, &amp; K. E. Muller: Applied Regression Analysis and Other Multivariable Method (Duxbury Press, 1988, 2nd edition)</li> <li>D. M. Levine, M. L. Berenson, &amp; D. Stephan: Statistics for Managers - Using Microsoft Excel (Prentice Hall, 2n edition)</li> </ul>						
Course Website	webct.hku	u.hk						
Remarks	Other refe J. T. McCl M. R. Mido J. Neter, V P. Newbol I. Olkin, L.	webct.hku.hk CogSc or CompSc students having taken STAT1301 should obtain approval from the dept. Other reference: J. T. McClave & F. H. Dietrich II: Statistics (Maxwell Macmillian, 5th ed.) M. R. Middleton: Data Analysis Using Microsoft EXCEL 5.0 (Duxbury) J. Neter, W. Wasserman, & G. A. Whitmore: Applied Statistics (Allyn and Bacon) P. Newbold: Statistics for Business and Economics (Prentice-Hall, International Editions, 3rd ed.) I. Olkin, L. J. Gleser, & C. Derman: Probability Models and Applications (Prentice-Hall, 2nd ed.) J. G. Peatman: Introduction to Applied Statistics (Harper)						

STAT2312 Data min	Academic Year	2012				
Offering Department	Statistics and Actuarial Science	Quota	48			
Course Co-ordinator	Dr G C S Lui, Statistics and Actuarial Science					
Course Aim	With an explosion in information technology in the past decade, vast amounts of data appear in a variety of fields such as finance, customer relations management and medicine. The challenge of understanding these data with					
	110					

	usage of st spawned.	the aim of creating new knowledge and finding new relationships among data attributes has led to the innovative usage of statistical methodologies and development of new ones. In this process, a new area called data mining is spawned. This course provides a comprehensive and practical coverage of essential data mining concepts and statistical models for data mining.						
Course Contents	Data pre-p	rocessing, association rules, classification and regression trees, ne	eural networks and o	luster analysis.				
Learning Outcomes	<ul> <li>impleme modifying,</li> <li>understar</li> <li>weaknesse</li> <li>be profici</li> <li>identify a of the data</li> <li>evaluate</li> </ul>	<ul> <li>On successful completion of the course, students should be able to:</li> <li>implement data mining process summarized in the acronym SEMMA which stands for sampling, exploring, modifying, modeling, and assessing data.</li> <li>understand and apply a wide range of data mining techniques, and recognize their characteristics, strengths and weaknesses.</li> <li>be proficient with the leading data mining softwareSAS Enterprise Miner.</li> <li>identify and use appropriate data mining techniques for a data mining project, taking into account both the nature of the data to be mined and the goals of the user of the discovered knowledge.</li> <li>evaluate the quality of discovered knowledge, taking into account the requirements of the data mining task being solved and the goals of the user.</li> </ul>						
Pre-requisites	(Any stude	Pass in STAT1302 or STAT1306 or STAT2802 (Any student who has already passed in BIOL1608 or BIOL2608 or ECON1003 or STAT0301 or STAT0302 o STAT1301 or STAT1801 in 2009-10 or before can still apply for the course in 2012-2013.)						
Offer in 2012 - 2013	2nd sem		Examination	No Exam				
Offer in 2013 - 2014	Y							
Teaching Hours	The course	e consists of 36 lectures and 12 computer lab sessions.						
Assessment Method	100% cour	sework assessment (30% assignments, 40% tests and 30% group	project)					
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 outcom Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability 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 require Lack of analytical and critical abilities, logical and coherent thinking. Show very problems. Organization and presentational skills are minimally effective or ineffe	little or no ability to appl					
References	<ul> <li>Tan, P. N., Steinback, M. and Kumar, V.: Introduction to Data Mining (Addison Wesley, 2006)</li> <li>T. Hastie, R. Tibshirani, &amp; J. Friedeman: The Elements of Statistical Learning: Data Mining, Inference, an Prediction (Springer, New York, 2008, 2nd edition)</li> <li>M. Kantardzic: Data Mining: Concepts, Models, Methods, and Algorithms (Wiley, 2003)</li> <li>A. Webb: Statistical Pattern Recognition (Wiley, 2002, 2nd edition)</li> <li>Shmueli, G., Patel, N.R. &amp; Bruce, P.C.: Data Mining for Business intelligence: Concepts, Techniques, an Applications in Microsoft Office Excel with XLMiner (Wiley, 2010, 2nd edition)</li> <li>J. Han &amp; M. Kamber: Data Mining: Concepts and Techniques (Morgan Kaufmann, 2006, 2nd edition)</li> <li>Larose, D. T.: Discovering Knowledge in Data: An Introduction to Data Mining (Wiley, 2005)</li> </ul>							
Course Website	webct.hku.	hk						
Remarks	Relationsh	rences: M. J. A. Berry & G. S. Linoff: Data Mining Techniques: ip Management (Wiley, 2011, 3rd edition) T.: Data Mining: Methods and Models (Wiley, 2006)	For Marketing, Sal	es and Customer				

STAT2313 Marketing	engineering (6 credits)	Academic Year	2012			
Offering Department	Statistics and Actuarial Science	Quota				
Course Co-ordinator	Dr C W Kwan, Statistics and Actuarial Science					
Course Aim	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	Marketing decision models, Market response models, Survey research, Statistical methods for segmentation, Statistical methods for positioning, Statistical methods for new product design					
Learning Outcomes	On successful completion of the course, students should be able to: - develop the hands-on skills of curve fitting with Excel Solver and analyzing data with SAS procedures, PROC CLUSTER, PROC FASTCLUS, PROC PRINCOMP, PROC FACTOR, PROC MDS, PROC PRINQUAL, PROC TRANSREG, PROC LOGISTIC, PROC MDC, PROC DISCRIM and PROC CALIS. - understand marketing decision models and least squares method. - understand cluster analysis, principal component analysis, factor analysis, multidimensional scaling, choice models and discriminant analysis, confirmatory factor analysis and structural equation model in market segmentation, positioning and new product design.					
Pre-requisites	Pass in BIOL1608 or BIOL2608 or ECON1003 or STAT0301 or STAT03 STAT1801	02 or STAT1301 o	or STAT1306 or			

Offer in 2012 - 2013	1st sem		Examination	Dec					
Offer in 2013 - 2014	Y	Y							
Teaching Hours	The cou	rse consists of 36 lectures and 12 tutorials/example classes.							
Assessment Method		One 2-hour examination (50% weighting) and a coursework assessment (50% weighting) based on assignments, a class test and a group project.							
Course Grade	A+ to F								
Grade Descriptors	A	Demonstrate thorough mastery at an advanced level of extensive knowled learning outcomes. Show strong analytical and critical abilities and logical thin to apply knowledge to a wide range of complex, familiar and unfamiliar situ presentational skills.	king, with evidence of origin	nal thought, and ability					
	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.							
References	5th ed.) Lattin J, Lilien, G	Johnson R, Wichern D: Applied Multivariate Statistical Analysis (Prentice Hall, 5th ed.) Lattin J, Carroll JD and Green PE: Analysing multivatiate data (Thomson) Lilien, G.L. and Rangaswamy, A: Marketing Engineering (Prentice Hall, 2003, 2nd ed.) Hair, Black, Babin, Anderson & Tatham: Multivariate data analysis (Pearson, 2006, 6th ed.)							
Course Website	webct.hk	ku.hk							

Statistics a	and Act	tuarial Salana	1					
	Statistics and Actuarial Science Quota							
Dr R W L Wong, Statistics and Actuarial Science								
individual forecasts f	n daily business operations, forecasts are routinely required on different aspects of the economy, the market and ndividual companies. Numerous statistical techniques have been developed in the past decades to provide orecasts for the business decision-maker. This course considers a wide range of such techniques that have broven useful to practitioners. The course will involve the use of computer software, EXCEL, in the teaching process.							
averages	and s	smoothing me	thods; simple	linear regressi	on; multiple reg			
<ul> <li>Understa</li> <li>Understa</li> <li>methods, state</li> </ul>	and dat tand fo simple	ta patterns and precasting me and multiple l	d choose a su ethods: movin inear regressi	itable forecasting g averages an on	g techniques d smoothing m			
Not for stu	Not for students who have passed or already enrolled in any of these courses:							
Not offered	ed					Examination	To be confirme	
Y								
The course	se cons	sists of 36 lectu	ures and 12 tu	torials/example	classes.			
		mination (60%	weighting) a	nd a coursework	c assessment (4	0% weighting) base	ed on assignmen	
A+ to F								
Descriptors         Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for at learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of origin to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective presentational skills.           B         Demonstrate substantial command of a broad range of knowledge and skills required for attaining at lear learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability 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 o outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apple familiar situations. Apply moderately effective organizational and presentational skills.					ng, with evidence of origi	nal thought, and abilit		
Demonstrate partial but limited command of knowledge and skills required for attaining some of the course le Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.						Show limited ability t		
Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcome Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to sproblems. Organization and presentational skills are minimally effective or ineffective.								
	individual forecasts proven u process. Review c averages regressio On succe - Underst - Underst methods, - Develop Pass in B Not for st STAT130 Not offere Y The cours One 2-hc and a cla A+ to F A B C D Fail	individual comp forecasts for the proven useful to process. Review of basic averages and s regression; the H On successful c - Understand da - Understand fa - Understand fr methods, simple - Develop hands Pass in BIOL160 Not for students STAT1301, STA Not offered Y The course cons One 2-hour exa and a class test A+ to F A Dem B Dem B Dem fami C Dem Shoo appt Fail Dem	individual companies. Numer forecasts for the business de proven useful to practitioners process. Review of basic statistical co averages and smoothing me regression; the handling of sea On successful completion of th - Understand data patterns and - Understand forecasting me methods, simple and multiple I - Develop hands-on skills of ar Pass in BIOL1608 or BIOL260 Not for students who have pas STAT1301, STAT1801, STAT2 Not offered Y The course consists of 36 lectr One 2-hour examination (60% and a class test A+ to F A Demonstrate thorough learning outcomes. Sh to apply knowledge to presentational skills. B Demonstrate general outcomes. Show evide familiar and some unfa familiar situations. App D Demonstrate general outcomes. Show evide familiar situations. App Show evidence of sor apply knowledge to so Fail Demonstrate little or r Lack of analytical and problems. Organizatio	individual companies. Numerous statistical forecasts for the business decision-maker. proven useful to practitioners. The course process.         Review of basic statistical concepts; autoc averages and smoothing methods; simple regression; the handling of seasonal cycles; On successful completion of the course, stud - Understand data patterns and choose a su - Understand forecasting methods: movim methods, simple and multiple linear regressi - Develop hands-on skills of analyzing busin         Pass in BIOL1608 or BIOL2608 or ECON10 Not for students who have passed or already STAT1301, STAT1801, STAT2804, STAT33         Not offered         Y         The course consists of 36 lectures and 12 tu One 2-hour examination (60% weighting) at and a class test         A+ to F         A       Demonstrate thorough mastery at an at learning outcomes. Show strong analytic to apply knowledge to a wide range of presentational skills.         B       Demonstrate general but incomplete course courses. Show evidence of some coherent and apply knowledge to solve problems. Apply moderately eff         D       Demonstrate partial but limited commar apply knowledge to solve problems. Apply moderately eff         D       Demonstrate partial but limited commar apply knowledge to solve problems. Apply knowledge to solve problems. Apply moderately eff         D       Demonstrate partial but limited commar apply knowledge to solve problems. Apply moderately eff	individual companies. Numerous statistical techniques has forecasts for the business decision-maker. This course co proven useful to practitioners. The course will involve the process.Review of basic statistical concepts; autocorrelation analys averages and smoothing methods; simple linear regressi regression; the handling of seasonal cycles; decomposition r On successful completion of the course, students should be - Understand data patterns and choose a suitable forecasting - Understand forecasting methods: moving averages an methods, simple and multiple linear regression - Develop hands-on skills of analyzing business data with co Pass in BIOL1608 or BIOL2608 or ECON1003 or STAT0301 Not for students who have passed or already enrolled in any STAT1301, STAT1801, STAT2804, STAT3301, ECON0701. Not offered YThe course consists of 36 lectures and 12 tutorials/example One 2-hour examination (60% weighting) and a coursework and a class testA+ to FADemonstrate thorough mastery at an advanced level of expresentational skills. BBDemonstrate substantial command of a broad range of knowled learning outcomes. Show evidence of analytical and critical abiliti to apply knowledge to a wide range of complex, familiar a presentational skills. BBDemonstrate general but incomplete command of knowled outcomes. Show evidence of some analytical and critical a familiar situations. Apply moderately effective organizational polemos. Show evidence of some analytical and critical a familiar situations. Apply moderately effective organizational polemos. Show evidence of command of knowled and paty knowledge to solve problems. Apply limited or barely of apply knowledge to solve problems. Apply limited or barely of show evidence of some coherent and logical tinking, but app	individual companies. Numerous statistical techniques have been develo         forecasts for the business decision-maker. This course considers a wide         proven useful to practitioners. The course will involve the use of comput         process.         Review of basic statistical concepts; autocorrelation analysis; evaluation a         averages and smoothing methods; simple linear regression; multiple regregression; the handling of seasonal cycles; decomposition methods.         On successful completion of the course, students should be able to:         - Understand forecasting methods: moving averages and smoothing methods, simple and multiple linear regression         - Develop hands-on skills of analyzing business data with computer software         Pass in BIOL1608 or BIOL2608 or ECON1003 or STAT0301 or STAT0302 or         Not offered         Y         The course consists of 36 lectures and 12 tutorials/example classes.         One 2-hour examination (60% weighting) and a coursework assessment (4 and a class test         A         B       Demonstrate thorough mastery at an advanced level of extensive knowledge learning outcomes. Show evidence of analytical and critical abilities and logical thinkit to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply effective organizational and presentational skills reguires that and some unfamiliar situations. Apply indertely effective organizational and presentational skills required for a show evidence of some analytical and critical abilities and logical familiar and some unfamiliar situations. Apply indert	individual companies. Numerous statistical techniques have been developed in the past de forecasts for the business decision-maker. This course considers a wide range of such tecl process. Review of basic statistical concepts; autocorrelation analysis; evaluation and combination of averages and smoothing methods; simple linear regression; multiple regression; growth curegression; the handling of seasonal cycles; decomposition methods. On successful completion of the course, students should be able to: - Understand data patterns and choose a suitable forecasting techniques - Understand data patterns and choose a suitable forecasting techniques - Understand forecasting methods: moving averages and smoothing methods, decompose methods, simple and multiple linear regression - Develop hands-on skills of analyzing business data with computer software, EXCEL, and its ad Pass in BIOL1608 or BIOL2608 or ECON1003 or STAT0301 or STAT0302 or STAT1306; and Not for students who have passed or already enrolled in any of these courses: STAT1301, STAT1801, STAT2804, STAT3301, ECON0701. Not offered <b>Examination</b> Y The course consists of 36 lectures and 12 tutorials/example classes. One 2-hour examination (60% weighting) and a coursework assessment (40% weighting) base and a class test A+ to F A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for at learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of origit to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effect presentational skills. B Demonstrate substantial command of a broad range of knowledge and skills required for attaining most or outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to appl familiar and some unfamiliar situations. Apply effective organizational and presentational skills. D Demonstrate general but incomplete command of knowledge and skills required f	

References	<ul> <li>P. E. Gaynor &amp; R. C. Kirkpatrick: Introduction to Time-series Modelling and Forecasting in Business and Economics (McGraw-Hill, 1994)</li> <li>P. Newbold &amp; T. Bos: Introductory Business &amp; Economic Forecasting (ITP, 1994)</li> </ul>
Course Website	webct.hku.hk
Remarks	Also available to CompSc students having taken STAT1301. Students should obtain approval from the course coordinator before choosing this course.

STAT2315 Practical	mathemat	atics	s for inve	stment (6 c	redits)		4	Academic Year	2012
Offering Department	Statistics a	s and <i>i</i>	Actuarial S	Science				Quota	
Course Co-ordinator	Dr T S T V	Dr T S T Wong, Statistics and Actuarial Science							
Course Aim			cus of this also consid		t on the conc	epts on financi	al mathema	tics. Practical ap	plications of thes
Course Contents	schedules	This course covers: simple and compound interest; annuities certain; discounted cash flow analysis; amortization schedules and sinking funds; yield rates; bonds and related securities; practical applications such as real estate mortgage, short sales and term structure of interest rates.							
Learning Outcomes	- solve pra - carry out	On successful completion of the course, students should be able to: solve practical problems relating to annuities certain, simple and compound interest. carry out discounted cash flow analysis. apply amortization schedules and sinking funds to the practical problems such as real estate mortgage.							
Pre-requisites						TAT1306 or ST have already e			
Offer in 2012 - 2013	2nd sem	2nd sem						Examination	May
Offer in 2013 - 2014	Y						!		-
Teaching Hours	The cours	rse co	onsists of 3	6 lectures and	d 12 tutorials/e	xample classe	s.		
Assessment Method			examination a class test		ing) and a co	irsework asses	ssment (25%	weighting) base	d on assignment
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 outcom Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.						Show limited ability t		
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning o Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge problems. Organization and presentational skills are minimally effective or ineffective.								
Textbooks	Kellison, S	, S. G.	.: The The	ory of Interest	(Irwin: Illinois	2008, 3rd edit	ion)		
References	Broverma 2004, 3rd			ematics of In-	vestment and	Credit (ACTE)	C Publication	is - Mad River B	ooks: Connecticu

STAT2316 Advance	d SAS programming (6 credits)	Academic Year	2012					
Offering Department	Statistics and Actuarial Science	Quota	96					
Course Co-ordinator	TBC, Statistics and Actuarial Science							
Course Aim	This course aims to equip students, who have taken STAT26xx, with a high level of proficiency in SAS programming for automation of procedures and data processing in solving complex problems more efficiently.							
Course Contents	Accessing data using SQL. Macro programming. Advanced programming techniques including data simulation, advanced data look-up techniques, modifying transaction datasets and controlling I/O processing and memory.							
Learning Outcomes	On successful completion of the course, students should be able to: - apply SAS SQL to access data to perform queries - use advanced SAS programming statements and techniques to solve complex problems - use the BY statement for parallel processing to aid automation - use the output dataset without printing to OUTPUT windows for piping idea in automation - use SAS MACRO to develop customized and automated applications.							
Pre-requisites	Pass in STAT1303							
Offer in 2012 - 2013	Not offered Examination To be confirmed							
Offer in 2013 - 2014	Y							
Teaching Hours	The course consists of 36 lectures and 12 tutorials/example classes.							

Assessment Method		One 2-hour examination (50% weighting) and a coursework assessment (50% weighting) based on assignments tutorials and class test(s)					
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 knowledge and skills required for attaining some 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.					
Textbooks	On-line do	cuments of the adopted statistical software					
References	Schreier, H Carpenter,	SAS Certification Prep Guide: Advanced Programming for SAS 9, Third Edition. Schreier, H.: PROC SQL by Example: Using SQL within SAS. (North Carolina: SAS Institute Inc., 2008) Carpenter, A.: Carpenters Complete Guide to the SAS Macro Language. Second Edition. (North Carolina: SAS Institute Inc., 2004)					
Course Website	webct.hku	webct.hku.hk					

STAT2317 Sample s	urvey met	thods	(6 credits)				A	cademic Year	2012
Offering Department	Statistics a	and Ac	tuarial Science	9			Q	uota	
Course Co-ordinator	Head of D	Dept, St	tatistics and Ac	tuarial Scien	се				
Course Aim	This course will cover design and implementation of sample surveys and analysis of statistical data thus obtained Survey design includes overall survey design, design of sampling schemes and questionnaires, etc. Samplin methods include sample size determination, sampling and non-sampling errors and biases, methods of estimatic of parameters from survey data, imputation for missing data etc.								
Course Contents	managem random sa determina responses private se	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, nor 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.							
Learning Outcomes	<ul> <li>demonstration</li> <li>of sample</li> <li>design of survey</li> <li>make state</li> </ul>	On successful completion of the course, students should be able to: - demonstrate knowledge and understanding of the various steps to be taken in the planning and implementatio of sample surveys - design different sample schemes and select the most efficient and suitable one for adoption for a particula							
Pre-requisites			/ enrolled in a T1301, STAT1			rses: BIOL160	8 or BIC	L2608, ECON1	003, STAT030 <sup>-</sup>
Offer in 2012 - 2013	Not offere	ed					E	xamination	Мау
Offer in 2013 - 2014	Y								
Teaching Hours	The cours	se cons	sists of 36 lectu	ires and 12 ti	utorials/exam	ple classes.			
Assessment Method	One 2-hou tutorials, a			weighting) a	nd a coursev	vork assessme	nt (25% v	veighting) based	on assignment
Course Grade	A+ to F								
Grade Descriptors	A	learn to ap	iing outcomes. Šho	ow strong analyt	ical and critical	abilities and logical	thinking, wi	kills required for atta th evidence of origina Apply highly effective	al thought, and abili
	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 outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to ap familiar situations. Apply moderately effective organizational and presentational skills.								
	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 outcom         Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to so problems. Organization and presentational skills are minimally effective or ineffective.								
		probl	iomo. organization	i anu presentati					

	<ul> <li>W. G. Cochran: Sampling Techniques (John Wiley &amp; Sons Ltd., 1997)</li> <li>R. M. Groves, F. J. Gowler, M. P. Couper, J. M. Lepkowski, E. Singer &amp; R. Tourangeau: Survey Methodology (John Wiley &amp; Sons Ltd., 2009, 2nd edition)</li> <li>L. Kish: Survey Sampling (John Wiley &amp; Sons, Inc., 1995)</li> <li>P. Salant &amp; D. A. Dillman: How to Conduct Your Own Survey (John Wiley &amp; Sons, Inc., 1994)</li> </ul>
Course Website	webct.hku.hk
Remarks	Other references: Census and Statistics Department, Hong Kong SAR: Annual Digest of Statistics (latest release)

STAT2318 Directed	studies in	n stati	tistics (6 cre	dits)			Academic Year	2012
Offering Department	Statistics	s and A	Actuarial Scien	ce			Quota	30
Course Co-ordinator	Prof S M	IS Lee,	e, Statistics and	Actuarial Science	e			
Course Aim	To enhan	ance stu	udents' knowle	dge of a particula	r topic and student	s' self-direct	ed learning and cr	itical thinking skills
Course Contents	topic is pr or a synt	The student undertakes a self-managed study on a topic in statistics under the supervision of a staff member. Th topic is preferably one not sufficiently covered in the regular curriculum. The directed study can be a critical review or a synthesis of published work on the subject, or a laboratory or field study that would enhance students understanding of the subject. The project may not require an element of originality.						
Learning Outcomes	- gain first - develop statistical - write suc	On successful completion of the course, students should be able to: - gain first-hand experience in solving a research or applied problem in statistics or related areas; - develop skills in important technical tools, including the use of computer software or programs, for typical statistical research and data analyses; - write succinct reports on the findings of a research study; - make concise oral presentation of the findings of a research study.						
Pre-requisites	Pass in STAT130 Not for st	n 18 cre 304, STA students	redits from th	1323, STĂT1801 eady enrolled in S	ses: STAT0301, S , STAT1802; and STAT3319 in this a			1302, STAT1303
Offer in 2012 - 2013	Year long	ng					Examination	No Exam
Offer in 2013 - 2014	Y							1
Feaching Hours	Discussio	ion and	d meetings to b	e arranged by the	e student and the s	upervisor.		
Assessment Method	Written re	report (S	(50%), oral pre	sentation and par	ticipation (50%)			
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.							
	С	Demonstrate general but incomplete grasp of the subject. Evidence of some analytical and critical abilities and logical the				interpretations and to		
	D	Demonstrate partial but limited grasp, with retention of some relevant information, of the subject. Evidence of some coher				of several sources, bu		
	Fail	Demonstrate evidence of little or no grasp of the knowledge and understanding of the subject. Evidence of little or lack					o critical comparison o	
Course Website	webct.hku	ku.hk						
Remarks	Managem	ement, a	and consent of	anagement and a Major Coordinato nitted in 2006 or I		of introducto	ory-level courses i	n Statistics or Ris

STAT2801 Life cont	Academic Year	2012			
Offering Department	Statistics and Actuarial Science Quota				
Course Co-ordinator	Dr E C K Cheung, Statistics and Actuarial Science				
Course Aim	The major objectives of this course are to integrate life contingencies into a full probabilistic framework. The time until-death random variable is the basic building block by which models for life insurances, designed to reduce the financial impact of the random event of untimely death, are developed. This course introduces the concepts of life contingencies and the basic mathematical skills for modelling life insurance products.				
Course Contents	Key topics include: survival distributions; life table functions; select and ultimate tables; life insurance models; life annuity models; benefit premiums; benefit reserves.				
Learning Outcomes	On successful completion of the course, students should be able to: - calculate the expected values, variances, probabilities, and percentiles for su	urvival-time random	variables;		

	<ul> <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-benefit random variables, present-value-of-loss-at-issue random variables, and present-value-of-loss random variables;</li> <li>calculate benefit premiums for life insurances and annuities;</li> <li>calculate benefit reserves for life insurances and annuities;</li> <li>cover part of Exam MLC of the Society of Actuaries.</li> </ul>					
Pre-requisites	Pass in S	(Pass in STAT1302 and STAT2315) or (Pass in STAT1802 and (Pass in STAT2802, or already enrolled in this course)) or (Pass in STAT1302 and STAT1802)				
Offer in 2012 - 2013	1st sem			Examination	Dec	
Offer in 2013 - 2014	Y					
Teaching Hours	The cours	e consists of 36 lectures and 12 tutorials/example class	ses.			
Assessment Method	One 3-ho assignmer	One 3-hour written examination (75% weighting) and a coursework assessment (25% weighting) based or assignments, tutorials and class tests				
Course Grade	A+ to F					
Grade Descriptors	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.					
	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.					
	C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.					
	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.					
	Fail	Demonstrate little or no evidence of command of knowledge an Lack of analytical and critical abilities, logical and coherent thinki problems. Organization and presentational skills are minimally effo	ing. Show very I	ittle or no ability to apply		
Textbooks	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				997, 2nd edition),	
References		.M.D., Hardy, M.R., and Waters, H.R.: Actuarial Ma University Press, 2009)	thematics for	Life Contingent R	isks (Cambridge:	
Course Website	webct.hku	hk				

STAT2802 Statistica	l models (6	S credits)	Academic Year	2012		
Offering Department	Statistics a	nd Actuarial Science	Quota			
Course Co-ordinator	Dr G Tian,	Statistics and Actuarial Science				
Course Aim	study the of testing, the	This course is on the basis of 'STAT1801 Probability and Statistics: Foundation of Actuarial Science'. It will furthe 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.				
Course Contents	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.					
	On successful completion of the course, students should be able to: - understand the importance of sufficient statistic(s) in data reduction and statistical inferences such as point estimation, confidence interval estimation, and testing hypothesis; - derive maximum likelihood estimators of parameters to calculate maximum likelihood estimates; - locate pivotal quantity to construct confidence intervals of parameters; - find testing statistic to test hypotheses associated with one-sample and/or two-sample normal distributions with small sample sizes and non-normal distributions with large sample sizes					
Learning Outcomes	<ul> <li>understar</li> <li>estimation,</li> <li>derive ma</li> <li>locate piv</li> <li>find testin</li> </ul>	nd the importance of sufficient statistic(s) in data reduction a confidence interval estimation, and testing hypothesis; aximum likelihood estimators of parameters to calculate maximur otal quantity to construct confidence intervals of parameters;	n likelihood estimates	;		
Learning Outcomes Pre-requisites	<ul> <li>understar estimation,</li> <li>derive ma</li> <li>locate piv</li> <li>find testir small samp</li> <li>Pass in ST</li> </ul>	nd the importance of sufficient statistic(s) in data reduction a confidence interval estimation, and testing hypothesis; aximum likelihood estimators of parameters to calculate maximur otal quantity to construct confidence intervals of parameters; ng statistic to test hypotheses associated with one-sample and/ ole sizes and non-normal distributions with large sample sizes	n likelihood estimates	;		
	<ul> <li>understar estimation,</li> <li>derive ma</li> <li>locate piv</li> <li>find testir small samp</li> <li>Pass in ST</li> </ul>	nd the importance of sufficient statistic(s) in data reduction a confidence interval estimation, and testing hypothesis; aximum likelihood estimators of parameters to calculate maximur otal quantity to construct confidence intervals of parameters; no statistic to test hypotheses associated with one-sample and/ole sizes and non-normal distributions with large sample sizes AT1801.	n likelihood estimates	;		
Pre-requisites	<ul> <li>understar estimation,</li> <li>derive ma</li> <li>locate piv</li> <li>find testir small samp</li> <li>Pass in ST (For BSc(A)</li> </ul>	nd the importance of sufficient statistic(s) in data reduction a confidence interval estimation, and testing hypothesis; aximum likelihood estimators of parameters to calculate maximur otal quantity to construct confidence intervals of parameters; no statistic to test hypotheses associated with one-sample and/ole sizes and non-normal distributions with large sample sizes AT1801.	n likelihood estimates 'or two-sample norma	; I distributions with		
Pre-requisites Offer in 2012 - 2013	<ul> <li>understar estimation,</li> <li>derive ma</li> <li>locate piv</li> <li>find testir</li> <li>small samp</li> <li>Pass in ST (For BSc(A)</li> <li>1st sem</li> <li>Y</li> </ul>	nd the importance of sufficient statistic(s) in data reduction a confidence interval estimation, and testing hypothesis; aximum likelihood estimators of parameters to calculate maximur otal quantity to construct confidence intervals of parameters; no statistic to test hypotheses associated with one-sample and/ole sizes and non-normal distributions with large sample sizes AT1801.	n likelihood estimates 'or two-sample norma	; I distributions with		
Pre-requisites Offer in 2012 - 2013 Offer in 2013 - 2014	<ul> <li>understare estimation,</li> <li>derive ma</li> <li>locate piv</li> <li>find testir small samp</li> <li>Pass in ST (For BSc(A)</li> <li>1st sem</li> <li>Y</li> <li>The course</li> <li>One 3-hour</li> </ul>	nd the importance of sufficient statistic(s) in data reduction a confidence interval estimation, and testing hypothesis; aximum likelihood estimators of parameters to calculate maximur otal quantity to construct confidence intervals of parameters; ng statistic to test hypotheses associated with one-sample and/ ole sizes and non-normal distributions with large sample sizes AT1801. .ctuarial Science) students only)	n likelihood estimates 'or two-sample norma Examination	I distributions with		
Pre-requisites Offer in 2012 - 2013 Offer in 2013 - 2014 Teaching Hours	<ul> <li>understare estimation,</li> <li>derive ma</li> <li>locate piv</li> <li>find testir small samp</li> <li>Pass in ST (For BSc(A)</li> <li>1st sem</li> <li>Y</li> <li>The course</li> <li>One 3-hour</li> </ul>	nd the importance of sufficient statistic(s) in data reduction a confidence interval estimation, and testing hypothesis; aximum likelihood estimators of parameters to calculate maximur otal quantity to construct confidence intervals of parameters; ng statistic to test hypotheses associated with one-sample and/ ole sizes and non-normal distributions with large sample sizes AT1801. actuarial Science) students only)	n likelihood estimates 'or two-sample norma Examination	I distributions with		

	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.
References	Miller I. & Miller M.: John E. Freund's Mathematical Statistics with Applications (Pearson Education International, 2004, 7th edition) Hogg R. V., McKean J. W. & Craig A. T.: Introduction to Mathematical Statistics (Pearson Prentice Hall, 2005, 6th edition) Arnold S. F.: Mathematical Statistics (Prentice-Hall, 1990)
Course Website	webct.hku.hk
Remarks	Other References: Larsen R. J. and Marx M. L.: An Introduction to Mathematical Statistics and Its Appications (Pearson International Edition, 4th edition)

	ic models (	6 credits)	Acader	nic Year	2012		
Offering Department	Statistics a	nd Actuarial Science	Quota				
Course Co-ordinator	Dr J F Yao	, Statistics and Actuarial Science					
Course Aim		This is an introductory course in probability modelling. A range of important topics in stochastic processes will b discussed.					
Course Contents	classification states, Poi Brownian I formula, G	Introduction to probability theory, Conditional probability and expectation, Markov chains, random walk models, classification of states in a Markov chain, calculation of limiting probabilities and mean time spent in transient states, Poisson process, distribution of interarrival time and waiting time, conditional distribution of the arrival time Brownian Motion, hitting time and maxium 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).					
Learning Outcomes	<ul> <li>apply the</li> <li>understar</li> </ul>	On successful completion of the course, students should be able to: - apply the conditioning method to calculate the mean and probability - understand the essentials of Markov chains, the Poisson process, and Brownian motion - understand how stochastic models can be applied to the study of real-life phenomena					
Pre-requisites	Pass in ST Not for stu	For BSc(Actuarial Science) students only; and Pass in STAT1801; and Not for students who have passed in MATH2603, or have already enrolled in this course; and Not for students who have passed in STAT2303, or have already enrolled in this course.					
Offer in 2012 - 2013	1st sem		Examin	ation	Dec		
Offer in 2013 - 2014	Y						
Teaching Hours	The course	e consists of 36 lectures and 12 tutorials/example c	lasses.				
Assessment Method		rr written examination (75% weighting), and a c ts and a class test	coursework assessment (	25% weig	hting) based or		
Course Grade	A+ to F						
Crada Descriptors	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required learning outcomes. Show strong analytical and critical abilities and logical thinking, with evide to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply his presentational skills.						
Grade Descriptors	A	learning outcomes. Show strong analytical and critical abilities to apply knowledge to a wide range of complex, familiar an	s and logical thinking, with evide	nce of origina	al thought, and ability		
orade Descriptors	A B	learning outcomes. Show strong analytical and critical abilities to apply knowledge to a wide range of complex, familiar an	s and logical thinking, with evide ad unfamiliar situations. Apply h vledge and skills required for att I abilities and logical thinking, a	nce of origina ighly effective aining at leas and ability to	al thought, and ability e organizational and st most of the course		
Grade Descriptors		learning outcomes. Show strong analytical and critical abilities to apply knowledge to a wide range of complex, familiar an presentational skills. Demonstrate substantial command of a broad range of know learning outcomes. Show evidence of analytical and critical	s and logical thinking, with evide d unfamiliar situations. Apply h vledge and skills required for att i abilities and logical thinking, a izational and presentational skills ge and skills required for attair ilities and logical thinking, and a	nce of origina ighly effective aining at leas and ability to s. hing most of	al thought, and ability e organizational and st most of the course apply knowledge to the course learning		
Grade Descriptors	В	learning outcomes. Show strong analytical and critical abilities to apply knowledge to a wide range of complex, familiar an presentational skills. Demonstrate substantial command of a broad range of know learning outcomes. Show evidence of analytical and critical familiar and some unfamiliar situations. Apply effective organi Demonstrate general but incomplete command of knowled outcomes. Show evidence of some analytical and critical abi	s and logical thinking, with evide d unfamiliar situations. Apply h vledge and skills required for att l abilities and logical thinking, a izational and presentational skills ge and skills required for attain ilities and logical thinking, and a and presentational skills. skills required for attaining some with limited analytical and critica	nce of origina ighly effective aining at leas and ability to s. hing most of ibility to apply of the course al abilities. Sh	al thought, and ability e organizational and st most of the course apply knowledge to the course learning y knowledge to mos e learning outcomes now limited ability to		
Grade Descriptors	B C	learning outcomes. Show strong analytical and critical abilities to apply knowledge to a wide range of complex, familiar an presentational skills. Demonstrate substantial command of a broad range of know learning outcomes. Show evidence of analytical and critical familiar and some unfamiliar situations. Apply effective organi Demonstrate general but incomplete command of knowledge outcomes. Show evidence of some analytical and critical abilitar familiar situations. Apply moderately effective organizational a Demonstrate partial but limited command of knowledge and a Show evidence of some coherent and logical thinking, but the	s and logical thinking, with evide d unfamiliar situations. Apply h vledge and skills required for att i abilities and logical thinking, a izational and presentational skills ge and skills required for attair ilities and logical thinking, and a and presentational skills. skills required for attaining some with limited analytical and critica ffective organizational and prese le and skills required for attainin thinking. Show very little or no a	nce of origina ighly effective aining at leas and ability to s. hing most of bility to apply of the course al abilities. St ntational skill: ig the course	al thought, and ability e organizational and st most of the course apply knowledge to the course learning y knowledge to mos e learning outcomes now limited ability to s.		
Grade Descriptors	B C D Fail	learning outcomes. Show strong analytical and critical abilities to apply knowledge to a wide range of complex, familiar an presentational skills. Demonstrate substantial command of a broad range of know learning outcomes. Show evidence of analytical and critical familiar and some unfamiliar situations. Apply effective organi Demonstrate general but incomplete command of knowledg outcomes. Show evidence of some analytical and critical abi familiar situations. Apply moderately effective organizational a Demonstrate partial but limited command of knowledge and s Show evidence of some coherent and logical thinking, but v apply knowledge to solve problems. Apply limited or barely eff Demonstrate little or no evidence of command of knowledge Lack of analytical and critical abilities, logical and coherent ti	s and logical thinking, with evide d unfamiliar situations. Apply h vledge and skills required for att i abilities and logical thinking, a izational and presentational skills ge and skills required for attair ilities and logical thinking, and a and presentational skills. skills required for attaining some with limited analytical and critica ffective organizational and prese le and skills required for attainin thinking. Show very little or no a	nce of origina ighly effective aining at leas and ability to s. hing most of bility to apply of the course al abilities. St ntational skill: ig the course	al thought, and ability e organizational and st most of the course apply knowledge to the course learning y knowledge to mos e learning outcomes now limited ability to s.		

STAT2804 Linear mo	STAT2804 Linear models and forecasting (6 credits)					
Offering Department	Statistics and Actuarial Science	Quota				
Course Co-ordinator	Prof Y Lam, Statistics and Actuarial Science	Prof Y Lam, Statistics and Actuarial Science				
Course Aim	This course deals with applied statistical methods of linear models and investi	gates various foreca	sting procedures			

	through us	ng linear models and time series ana	lysis.	through using linear models and time series analysis.				
Course Contents		and multiple linear regression; presive, moving average, autoregressive						
Learning Outcomes	<ul> <li>fit a simp</li> <li>do ANOV</li> <li>fit a gene</li> <li>identify a</li> <li>perform r</li> </ul>	On successful completion of the course, students should be able to: - fit a simple or multiple linear regression model to real data; - do ANOVA analysis; - fit a generalized linear model to the real data; - identify and fit a suitable AR, MA or ARMA model to real data; - perform residual analysis; - do forecasting with these fitted models.						
Pre-requisites	Pass in ST For BSc(A Not for stu Not for stu	(Pass in STAT1302; or Pass in STAT2802, or already enrolled in this course); and For BSc(Actuarial Science) students only; and Not for students who have passed in STAT2301, or have already enrolled in this course; and Not for students who have passed in STAT3301, or have already enrolled in this course; and Not for students who have passed in ECON0701, or have already enrolled in this course.						
Offer in 2012 - 2013	2nd sem			Examination	May			
Offer in 2013 - 2014	Y							
Teaching Hours	The course	consists of 36 lectures and 12 tutoria	als/example classes.					
Assessment Method		One 3-hour written examination (75% weighting), and a coursework assessment (25% weighting) based or assignments, tutorials and a class test						
Course Grade	A+ to F							
Grade Descriptors	A	Demonstrate thorough mastery at an advar learning outcomes. Show strong analytical a to apply knowledge to a wide range of com presentational skills.	nd critical abilities and logical thinking,	with evidence of orig	ginal thought, and ability			
	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 commoutcomes. Show evidence of some analytic familiar situations. Apply moderately effective	al and critical abilities and logical think	king, and ability to ap				
	D	Demonstrate partial but limited command of Show evidence of some coherent and logic apply knowledge to solve problems. Apply lim	al thinking, but with limited analytical	and critical abilities.	Show limited ability to			
	Fail	Demonstrate little or no evidence of comma Lack of analytical and critical abilities, logica problems. Organization and presentational s	al and coherent thinking. Show very lit	tle or no ability to ap				
References	Abraham &	Problems. Organization and presentational skills are minimally effective or ineffective. R. S. Pindyck & D. L. Rubinfeld: Econometric Models and Economic Forecasts (McGraw-Hill, 1998, 4th edition) Abraham & J. Ledolter: Statistical Methods for Forecasting (John Wiley & Sons, 2005, 2nd edition) G. E. P. Box, G. M. Jenkins & G. Reinsel: Time Series Analysis: Forecasting and Control (Prentice Hall, 1994, 3rd edition)						
Course Website	webct.hku.	ık						

STAT2805 Credibilit	y theory and loss distributions (6 credits)	Academic Year	2012			
Offering Department	Statistics and Actuarial Science	Quota				
Course Co-ordinator	Dr K C Cheung, Statistics and Actuarial Science					
Course Aim	Credibility is an example of a statistical estimate. The idea of credibility is very useful in premit calculation. Insurance loss varies according to the business nature, what distribution should be used to f particular loss is both of theoretical interest and practical importance. This course covers important actuarial statistical methods.					
Course Contents	Limited fluctuation approach; Buhlman's approach; Bayesian approach; empirical Bayes parameter estimations construction and selection of parametric models; properties and estimation of failure time and loss distributions determination of the acceptability of a fitted model; comparison of fitted models; simulation of both discrete an continuous random variables.					
Learning Outcomes	<ul> <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 Bayesian 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> </ul>					
	<ul> <li>apply limited fluctuation (classical) credibility including criteria for both full ar</li> <li>perform Bayesian analysis using both discrete and continuous models;</li> <li>apply Buhlmann and Buhlmann-Straub models and understand the relations</li> <li>apply conjugate priors in Bayesian analysis and in particular the Poisson-ga</li> <li>apply empirical Bayesian methods in the nonparametric and semiparametric</li> </ul>	ship of these to the E mma model;	Bayesian model;			
	<ul> <li>apply limited fluctuation (classical) credibility including criteria for both full ar</li> <li>perform Bayesian analysis using both discrete and continuous models;</li> <li>apply Buhlmann and Buhlmann-Straub models and understand the relations</li> <li>apply conjugate priors in Bayesian analysis and in particular the Poisson-ga</li> <li>apply empirical Bayesian methods in the nonparametric and semiparametric</li> <li>construct and select empirical models;</li> </ul>	ship of these to the E mma model;	Bayesian model;			
Pre-requisites	<ul> <li>apply limited fluctuation (classical) credibility including criteria for both full ar</li> <li>perform Bayesian analysis using both discrete and continuous models;</li> <li>apply Buhlmann and Buhlmann-Straub models and understand the relations</li> <li>apply conjugate priors in Bayesian analysis and in particular the Poisson-ga</li> <li>apply empirical Bayesian methods in the nonparametric and semiparametric</li> <li>construct and select empirical models;</li> <li>determine the acceptability of a fitted model and/or compare models.</li> </ul>	ship of these to the E mma model;	Bayesian model; Dec			
Pre-requisites Offer in 2012 - 2013	<ul> <li>apply limited fluctuation (classical) credibility including criteria for both full ar</li> <li>perform Bayesian analysis using both discrete and continuous models;</li> <li>apply Buhlmann and Buhlmann-Straub models and understand the relations</li> <li>apply conjugate priors in Bayesian analysis and in particular the Poisson-ga</li> <li>apply empirical Bayesian methods in the nonparametric and semiparametric</li> <li>construct and select empirical models;</li> <li>determine the acceptability of a fitted model and/or compare models.</li> <li>Pass in STAT1302 or STAT2802 or STAT3810</li> </ul>	ship of these to the E mma model; cases;				
Pre-requisites Offer in 2012 - 2013 Offer in 2013 - 2014	<ul> <li>apply limited fluctuation (classical) credibility including criteria for both full ar perform Bayesian analysis using both discrete and continuous models;</li> <li>apply Buhlmann and Buhlmann-Straub models and understand the relations</li> <li>apply conjugate priors in Bayesian analysis and in particular the Poisson-ga</li> <li>apply empirical Bayesian methods in the nonparametric and semiparametric construct and select empirical models;</li> <li>determine the acceptability of a fitted model and/or compare models.</li> <li>Pass in STAT1302 or STAT2802 or STAT3810</li> <li>1st sem</li> </ul>	ship of these to the E mma model; cases;				
Pre-requisites Offer in 2012 - 2013 Offer in 2013 - 2014 Teaching Hours Assessment Method	<ul> <li>apply limited fluctuation (classical) credibility including criteria for both full ar</li> <li>perform Bayesian analysis using both discrete and continuous models;</li> <li>apply Buhlmann and Buhlmann-Straub models and understand the relations</li> <li>apply conjugate priors in Bayesian analysis and in particular the Poisson-ga</li> <li>apply empirical Bayesian methods in the nonparametric and semiparametric</li> <li>construct and select empirical models;</li> <li>determine the acceptability of a fitted model and/or compare models.</li> <li>Pass in STAT1302 or STAT2802 or STAT3810</li> <li>1st sem</li> <li>Y</li> </ul>	ship of these to the E mma model; cases; Examination	Dec			

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 knowledge and skills required for attaining some 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.
References		S. A., Panjer H. H., & Willmot G. E.: Loss Models: From Data to Decisions (John Wiley & Sons, 2008, 3rd Chapters 12-16, 20-21.
Course Website	webct.hk	zu.hk

		or actuaria	science (6 c	realis)		Acad	lemic Year	2012
Offering Department	Statistics a	and Actuarial	Science			Quot	a	
Course Co-ordinator	Dr J K Woo	o, Statistics a	nd Actuarial Sci	ience				
Course Aim	Actuaries. finance. Th	This course is designed for actuarial science students to receive VEE-Corporate Finance from Society o Actuaries. The objective of this course is to introduce students to the fundamental principles of corporate finance. The course will provide students with a systematic framework within which to evaluate investment and financing decisions for corporations.						
Course Contents	covered in present val and Black- corporate efficiency,	The first part of the course will give an introduction to corporate finance and provide an overview of some topics covered in STAT1802 and STAT2315. These include: financial markets and companies; present value and net present value, financial instruments and dividends derivatives market, no-arbitrage pricing theory, binomial model and Black-Scholes option pricing formula. The main part of the course will focus on some important topics of corporate finance including: capital structure and dividend policy, financial leverage and firm value, market efficiency, risk and return, investment decision using Markowitz mean variance analysis, CAPM, long term financing, measures and performance assessment of financial performance using various measures.						
Learning Outcomes	<ul> <li>understar</li> <li>and also th</li> <li>calculate</li> <li>assess fir</li> </ul>	On successful completion of the course, students should be able to: - understand the factors to be considered by a company when deciding on its capital structure and dividend policy and also the impact of financial leverage and long/short term financing policies on capital structure; - calculate the value of bonds and stocks; - assess financial performance using various measures; - understand the mean-variance portfolio theory.						
Pre-requisites		JSI1002 and S AT2310 and	STAT1802; or STAT2315.					
Offer in 2012 - 2013	2nd sem					Exam	nination	Мау
Offer in 2013 - 2014	Y							
Teaching Hours	The course							
	The course	e consists of 3	86 lectures and	12 tutorials/exar	nple classes.			
	One 3-hou	ur written ex			nple classes. d a coursework	assessment	t (25% weigt	nting) based o
Assessment Method	One 3-hou	ur written ex	amination (75%		•	assessment	t (25% weigt	nting) based o
Assessment Method Course Grade Grade Descriptors	One 3-hou assignmen	ur written ex tts, tutorials a Demonstrate learning outco	amination (75% nd a class test horough mastery a mes. Show strong a ledge to a wide ra	6 weighting) and at an advanced leve analytical and critical	•	edge and skills hinking, with ev	required for atta	ining all the cours I thought, and abili
Assessment Method Course Grade	One 3-hou assignmen A+ to F	Demonstrate learning outco be provided apply know presentational Demonstrate services apply constrates learning outco	amination (75% nd a class test horough mastery a mes. Show strong a ledge to a wide ra skills. substantial commar mes. Show evider	weighting) and at an advanced leve analytical and critical nge of complex, fan ad of a broad range ce of analytical and	of extensive knowle	edge and skills hinking, with ev ituations. Apply Ills required for logical thinking	required for atta idence of origina y highly effective attaining at least attaining at least	ining all the cours I thought, and abili organizational an t most of the cours
Assessment Method Course Grade	One 3-hou assignmen A+ to F A	Demonstrate learning outco to apply know presentational Demonstrate a learning outco familiar and so Demonstrate outcomes. Sh	amination (75% nd a class test horough mastery a mes. Show strong a ledge to a wide ra skills. substantial commar mes. Show evider me unfamiliar situa general but incomp we vidence of sor	weighting) and at an advanced leve analytical and critical nge of complex, fan d of a broad range ace of analytical and titons. Apply effective plete command of k ne analytical and cri	d a coursework of extensive knowle abilities and logical t iliar and unfamiliar s of knowledge and ski critical abilities and	edge and skills hinking, with ev ituations. Apply lls required for logical thinking resentational si required for att cal thinking, an	required for atta idence of origina y highly effective attaining at least attaining at least attaining most of t	ining all the cours I thought, and abili organizational an t most of the cours apply knowledge t the course learnin
Assessment Method Course Grade	One 3-hou assignmen A+ to F A B	Demonstrate learning outco to apply know presentational Demonstrate 3 learning outco familiar and so Demonstrate outcomes. Sh familiar situati Demonstrate 1 Show evidenc	amination (75% nd a class test horough mastery a mes. Show strong a ledge to a wide ra skills. substantial commar mes. Show evider me unfamiliar situa general but incomp w evidence of sor ons. Apply moderat vartial but limited cc e of some coherer	at an advanced leve analytical and critical nge of complex, fan and of a broad range ice of analytical and titions. Apply effective polete command of k ne analytical and cri ely effective organiza sommand of knowledo t and logical thinkin	d a coursework of extensive knowle abilities and logical t illiar and unfamiliar s of knowledge and ski critical abilities and e organizational and p nowledge and skills ical abilities and logi	edge and skills hinking, with ev situations. Apply lls required for logical thinking resentational si required for att cal thinking, an onal skills. for attaining son alytical and cri	required for atta idence of origina y highly effective attaining at least attaining at least attaining at least attaining at least attaining most of f d ability to apply me of the course tical abilities. Sh	ining all the cours I thought, and abili e organizational an t most of the cours apply knowledge t the course learnin knowledge to most e learning outcome: tow limited ability t
Assessment Method Course Grade	One 3-hou assignmen A+ to F A B C	Demonstrate learning outco to apply know presentational Demonstrate set learning outco familiar and so Demonstrate set outcomes. Sh familiar situati Demonstrate p Show evideno Demonstrate Lack of analyt	amination (75% and a class test horough mastery a mes. Show strong g ledge to a wide ra skills. substantial commar me unfamiliar situe general but incom general but incom pons. Apply moderat vartial but limited cc e of some coherer ge to solve problen ittle or no evidence ical and critical abi	at an advanced leve analytical and critical nge of complex, fan do fa broad range ice of analytical and titons. Apply effective olete command of k ne analytical and cri ely effective organiza pormand of knowledo t and logical thinkin ns. Apply limited or b e of command of kn	d a coursework of extensive knowle abilities and logical t iliar and unfamiliar s of knowledge and skil critical abilities and logi critical abilities and logi titional and presentati e and skills required g, but with limited ar	edge and skills hinking, with ev ittuations. Apply ulls required for logical thinking resentational si required for attaining so nalytical and cri zational and pre equired for attai very little or no	required for atta idence of origina y highly effective attaining at least g, and ability to kills. taining most of f d ability to apply me of the course esentational skills ining the course	ining all the cours I thought, and abili e organizational an t most of the cours apply knowledge t the course learnin knowledge to most elearning outcome: learning outcome: learning outcome:
Assessment Method Course Grade	One 3-hou assignmen A+ to F A B C D Fail	Demonstrate learning outco to apply know presentational Demonstrate 3 learning outco familiar and so Demonstrate 4 Demonstrate 5 Demonstrate 5 Show evidence apply knowled Demonstrate Lack of analyt problems. Org	amination (75% nd a class test horough mastery a mes. Show strong a ledge to a wide ra skills. substantial commar mes. Show evider me unfamiliar situa general but incomp w evidence of sor ons. Apply moderat vartial but limited co e of some coherer ge to solve problem ittle or no evidence ical and critical abi anization and prese	at an advanced leve analytical and critical nge of complex, fan and of a broad range ice of analytical and titions. Apply effective plete command of k ne analytical and cri ely effective organizz ommand of knowledge thand logical thinkin ns. Apply limited or b e of command of kn lities, logical and col entational skills are n	d a coursework d of extensive knowle abilities and logical t illiar and unfamiliar s of knowledge and skills critical abilities and logi organizational and p nowledge and skills recal abilities and logi ational and presentati e and skills required g, but with limited ar arely effective organiz owledge and skills re erent thinking. Show	edge and skills hinking, with ev ituations. Apply lls required for logical thinking resentational sl required for att at thinking, an onal skills. for attaining so nalytical and cri zational and pre aquired for attai very little or n neffective.	required for atta idence of origina y highly effective attaining at least , and ability to a kills. taining most of t d ability to apply me of the course tical abilities. Sh issentational skills ining the course o ability to apply	ining all the cours I thought, and abili e organizational an t most of the cours apply knowledge t the course learnin knowledge to most elearning outcome: learning outcome: learning outcome:
Assessment Method Course Grade Grade Descriptors	One 3-hou assignmen A+ to F A B C D Fail Brealey R. Ross, S. A	Demonstrate learning outco to apply know presentational Demonstrate learning outco familiar and so Demonstrate learning outco familiar and so Demonstrate Show evidenci apply knowled Demonstrate Lack of analyl problems. Org A., Myers S.	amination (75% nd a class test horough mastery a mes. Show strong g ledge to a wide ra skills. substantial commar me unfamiliar situa general but incomp ons. Apply moderat partial but limited cc e of some coherer ge to solve problem ittle or no evidencc ical and critical abi anization and prese C. and Allen, F	at an advanced leve analytical and critical nge of complex, fan and of a broad range ice of analytical and titons. Apply effective olete command of k ne analytical and cri ely effective organizz ommand of knowledd thand logical thinkin ns. Apply limited or b e of command of kn lities, logical and col entational skills are n .: Principles of C fe, J.: Corporate	d a coursework of extensive knowle abilities and logical t iliar and unfamiliar s of knowledge and ski critical abilities and organizational and p nowledge and skills ical abilities and logi titional and presentati e and skills required g, but with limited ar arely effective organi- owledge and skills re- erent thinking. Show inimally effective or i	edge and skills hinking, with ev ituations. Apply lls required for logical thinking resentational si required for attaining so nalytical and cri zational and pre equired for attaining so rattical and cri zational and pre equired for attaining so nelfective.	required for atta idence of origina y highly effective attaining at least , and ability to a kills. taining most of t d ability to apply me of the course tical abilities. Sh issentational skills ining the course o ability to apply	ining all the cours I thought, and abili organizational an t most of the cours apply knowledge to the course learning knowledge to mo elearning outcome ow limited ability to a learning outcome

Academic Year 2012

Offering Department	Statistics a	nd Actuarial Science			Quota			
Course Co-ordinator	Prof H L Ya	ang, Statistics and Actua	rial Science					
Course Aim	estimation, ideas and	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 STAT3812 will cover all the concepts, principles and techniques needed for SoA Exam MFE.						
Course Contents	discrete-tim	Option on currencies; 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.						
Learning Outcomes	<ul> <li>Calculate</li> <li>Understar</li> <li>Understar</li> <li>conditional</li> <li>Understar</li> <li>volatility</li> <li>Understar</li> </ul>	On successful completion of the course, students should be able to: - Calculate option price using binomial tree - Understand the risk neutral probability - Understand basic probability theory, include probability space, random variable, conditional probability, conditional expectation and discrete time martingale - Understand the Black-Scholes formula and its assumptions, the Greek letters, option elasticity, and implied volatility - Understand the hedging strategies and portfolio, market-maker risk, self-financing portfolio - Understand exotic options						
Pre-requisites	Not for stud		nd in STAT3303, or have alre in FINA0301, or have alre					
Offer in 2012 - 2013	1st sem				Examination	Dec		
Offer in 2013 - 2014	Y							
Teaching Hours	The course	e consists of 36 lectures	and 12 tutorials/example	classes.				
Assessment Method	One 3-hour written examination (75% weighting) and a coursework assessment (25% weighting) based or assignments, tutorials and a class test							
	assignmen					,g,		
Course Grade	A+ to F					,		
Course Grade Grade Descriptors	-	ts, tutorials and a class to Demonstrate thorough mas learning outcomes. Show st		tensive knowledge and	with evidence of origin	taining all the course al thought, and ability		
	A+ to F	ts, tutorials and a class to Demonstrate thorough mas learning outcomes. Show st to apply knowledge to a presentational skills. Demonstrate substantial con learning outcomes. Show e	est tery at an advanced level of ex rong analytical and critical abiliti	tensive knowledge and es and logical thinking, nd unfamiliar situations wledge and skills requii al abilities and logical t	with evidence of origin a. Apply highly effective red for attaining at lea hinking, and ability to	taining all the course al thought, and ability re organizational and st most of the course		
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Grade Descriptors	A+ to F A A B C D Fail Robert L. M Lecture not	ts, tutorials and a class the constrate thorough mass learning outcomes. Show sto apply knowledge to a wipresentational skills. Demonstrate substantial conlearning outcomes. Show evidence of familiar and some unfamiliar Demonstrate partial but irrot structomes. Show evidence of some con apply knowledge to solve problems. Organization and McDonald: Derivatives M tes on conditional expect	est tery at an advanced level of ex- ong analytical and critical abiliti- de range of complex, familiar a mmand of a broad range of kno- vidence of analytical and critic situations. Apply effective organizational derately effective organizational ed command of knowledge and herent and logical thinking, but oblems. Apply limited or barely ef- dence of command of knowled al abilities, logical and coherent presentational skills are minima arkets (2nd edition), Chap	tensive knowledge and ss and logical thinking, nd unfamiliar situations wledge and skills requir al abilities and logical thi rizational and presentat dge and skills required pitites and logical think and presentational skill skills required for attair with limited analytical effective organizational a ge and skills required for thinking. Show very litt ly effective or ineffectiv others 10-14	with evidence of origin . Apply highly effective red for attaining at lean hinking, and ability to ional skills. for attaining most of ing, and ability to app s. ing some of the cours and critical abilities. S and presentational ski or attaining the cours le or no ability to app	taining all the course lai thought, and ability re organizational and st most of the course o apply knowledge to the course learning ly knowledge to most se learning outcomes. show limited ability to ls. e learning outcomes.		

STAT2813 Internshi	p in actuarial science (6 credits)	Academic Year	2012			
Offering Department	Statistics and Actuarial Science	Quota				
Course Co-ordinator	Dr L F K Ng, Statistics and Actuarial Science					
Course Aim	This course is offered to actuarial science students who take on an 6-month full time or similar internships. Th objective is for a student to complete this course as a project based on his/her internship.					
Course Contents	This course will include a written report which should er encountered by the student during his/her internship. In ma that the student has been involved in during his/her internsh	any situations, this would mean a re				
Learning Outcomes	On successful completion of the course, students should be - Gain practical experiences during internship. - Describe basic actuarial practices learned during the interr - Explain how actuarial theories learned in University can be - Provide context for specific technical skills developed in ba	nship. e applied in practice.				
Pre-requisites	Pass in STAT1802 or STAT2801; and For BSc(Actuarial Science) students only					
Offer in 2012 - 2013	1st sem 2nd sem	Examination	No Exam			
Offer in 2013 - 2014	Y					
Teaching Hours	No regular lectures					
Assessment Method	50% written report, 50% oral presentation and participation					
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 aptty. Critical use of data and results to draw appropriate and insightful conclusions. Apply highly effective organizational and presentational skills. [Work of A+ should show considerable additional work beyond that is required in wider areas relevant to the topic.]
	В	Demonstrate substantial grasp of the subject. Evidence of analytical and critical abilities and logical thinking. Critical use of relevant information from sources, showing ability to make meaningful comparisons between different secondary interpretations and to quote/reference aptly. Correct use of data of results to draw appropriate conclusions. Apply effective organizational and presentational skills.
	С	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 Website	webct.hl	ku.hk

STAT2820 Introduct	ion to fina	incial derivatives (6 credits)	Academic Year	2012				
Offering Department	Statistics a	and Actuarial Science	Quota					
Course Co-ordinator	Dr E C K (	Cheung, Statistics and Actuarial Science						
Course Aim		This course aims at providing an understanding of the fundamental concepts of financial derivatives. Emphase are on basic trading and hedging strategies, and the concept of no-arbitrage.						
Course Contents		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.						
Learning Outcomes	<ul> <li>define ar</li> <li>evaluate</li> </ul>	On successful completion of the course, students should be able to: - define and recognize the definitions of terms commonly used in derivatives markets; - evaluate the payoff and profit of basic derivative contracts, including forwards, futures, options, and swaps; - explain how derivative securities can be used as tools to manage financial risk.						
Pre-requisites	For BSc(A Not for stu Not for stu	Pass in STAT1802; and For BSc(Actuarial Science) students only; and Not for students who have passed in STAT3303, or have already enrolled in this course; and Not for students who have already passed in STAT3308 before; and Not for students who have passed in FINA0301, or have already enrolled in this course.						
Offer in 2012 - 2013	1st sem		Examination	Dec				
Offer in 2013 - 2014	Y							
Teaching Hours	The cours	se consists of 36 lectures and 12 tutorials/example classes.						
Assessment Method		our written examination (75% weighting) and a coursework a nts, tutorials and a class test	assessment (25% wei	ghting) based o				
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.							
			tuations. Apply highly effecti					
	В		ls required for attaining at lea	ve organizational ar				
	B C	presentational skills. Demonstrate substantial command of a broad range of knowledge and skill learning outcomes. Show evidence of analytical and critical abilities and l	Is required for attaining at lea logical thinking, and ability to resentational skills. required for attaining most o al thinking, and ability to app	ve organizational ar ast most of the cours o apply knowledge f the course learnin				
		presentational skills. Demonstrate substantial command of a broad range of knowledge and skill learning outcomes. Show evidence of analytical and critical abilities and I familiar and some unfamiliar situations. Apply effective organizational and pr Demonstrate general but incomplete command of knowledge and skills r outcomes. Show evidence of some analytical and critical abilities and logic	Is required for attaining at lea logical thinking, and ability to resentational skills. equired for attaining most o ral thinking, and ability to app nal skills. or attaining some of the cour altical and critical abilities.	ve organizational ar ast most of the cours o apply knowledge f the course learnir oly knowledge to mo se learning outcome Show limited ability				
	С	presentational skills. Demonstrate substantial command of a broad range of knowledge and skill learning outcomes. Show evidence of analytical and critical abilities and I familiar and some unfamiliar situations. Apply effective organizational and pr Demonstrate general but incomplete command of knowledge and skills r outcomes. Show evidence of some analytical and critical abilities and logic familiar situations. Apply moderately effective organizational and presentatio Demonstrate partial but limited command of knowledge and skills required fr Show evidence of some coherent and logical thinking, but with limited ans	Is required for attaining at lea logical thinking, and ability to resentational skills. equired for attaining most o al thinking, and ability to app anal skills. or attaining some of the cour alytical and critical abilities. S ational and presentational ski quired for attaining the cours very little or no ability to app	ve organizational ar ast most of the cours o apply knowledge f the course learnir ly knowledge to mo se learning outcome Show limited ability ills.				
Textbooks	C D Fail	presentational skills. Demonstrate substantial command of a broad range of knowledge and skill learning outcomes. Show evidence of analytical and critical abilities and I familiar and some unfamiliar situations. Apply effective organizational and pr Demonstrate general but incomplete command of knowledge and skills r outcomes. Show evidence of some analytical and critical abilities and logic familiar situations. Apply moderately effective organizational and presentatio Demonstrate partial but limited command of knowledge and skills required fn Show evidence of some coherent and logical thinking, but with limited and apply knowledge to solve problems. Apply limited or barely effective organizit Demonstrate little or no evidence of command of knowledge and skills red Lack of analytical and critical abilities, logical and coherent thinking. Show	Is required for attaining at lea logical thinking, and ability to resentational skills. equired for attaining most o al thinking, and ability to app mal skills. or attaining some of the cour alytical and critical abilities. Is ational and presentational sk quired for attaining the cours very little or no ability to app leffective.	ve organizational ar ast most of the cours o apply knowledge f the course learning ly knowledge to mo se learning outcome Show limited ability ills.				

Offering Department Sta	atistics and Actuarial Science	0	
<b>J J J J J J J J J J</b>		Quota	
Course Co-ordinator Dr (	G Li, Statistics and Actuarial Science		
clim seri	time series consists of a set of observations on a random variable taken over matology, economics, environment studies, finance and many other disci ries are usually correlated; the course establishes a framework to discu ferent type of time series, investigates various representations for the proce	plines. The observa iss this. This course	tions in a time e distinguishes

	of different forecasting procedures. Students will analyse real time-series data on the computer.							
Course Contents		y and the autocorrelation functions; linear stationary models; on; estimation and diagnostic checking; seasonal models and for						
Learning Outcomes	On successful completion of the course, students should be able to: - recognize a stationary vs non-stationary time series; - understand some basic properties of commonly used time series models such as AR (autoregressive), MA (moving average) and ARMA models; - transform non-stationary time series into stationary ones; - identify different time series models based on autocorrelation functions; - fit a suitable AR, MA or ARMA model to real data using SAS (after transforming to stationarity if necessary); - perform goodness of fit tests for such models; - do forecasting with these fitted time series models.							
Pre-requisites	Not for stu	Pass in STAT2301; and Not for students who have passed in STAT2314, or have already enrolled in this course; and Not for students who have passed in STAT2804, or have already enrolled in this course.						
Offer in 2012 - 2013	1st sem		Examination	Dec				
Offer in 2013 - 2014	Y							
Teaching Hours	The course	e consists of 36 lectures and 12 tutorials/example classes.						
Assessment Method		ur written examination (60% weighting) and a coursework ass est, and assignments	essment (40% weigh	ting) based on a				
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 outcome 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 requi Lack of analytical and critical abilities, logical and coherent thinking. Show ve problems. Organization and presentational skills are minimally effective or inef	ery little or no ability to app					
Textbooks	J. D. Cryei	& K.S. Chan: Time Series Analysis with Applications in R (Sprin	ger, 2008, 2nd edition	)				
References	W. W .S. V W. K. Li: D	aham & Johannes Ledolter: Statistical Methods for Forecasting (, Vei: Time Series Analysis: Univariate and Multivariate Methods (/ viagnostic Checks in Time Series (Chapman & Hall/CRC, 2004) ng: Non-linear Time Series: A Dynamical System Approach (Oxfo	Addison-Ŵesley, 2006	6, 2nd edition)				
Course Website	webct.hku	hk						

STAT3302 Multivaria	ate data analysis (6 credits)	Academic Year	2012				
Offering Department	Statistics and Actuarial Science	Quota	60				
Course Co-ordinator	Prof T W K Fung, Statistics and Actuarial Science						
Course Aim	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-or experience with the statistical software SAS.						
Course Contents	covariance matrix. Correlations: Simple, partial, multiple and ca	Problems with multivariate data. Multivariate normality and transforms. Mean structure for one sample. Tests o covariance matrix. Correlations: Simple, partial, multiple and canonical. Multivariate regression. Principal components analysis. Factor analysis. Problems for means of several samples. Multivariate analysis of variance. Discriminant analysis. Classification. Multivariate linear model.					
Learning Outcomes	On successful completion of the course, students should be able to: - analyze multivariate data with main SAS procedures, such as PRC CANCORR, PROC PRINCOMP, PROC FACTOR, PROC DISCRIM, P - compare the mean structure of multiple measurements for one or M MANOVA and profile analysis - investigate the linear associations among one/two group(s) of vac- correlation and multivariate regression - explore the latent linear structure of a data set with multiple measure factor analysis - classify observations of a population with one or more than one measure	ROC CANDISC and etc. nore than one population ariables by multiple, parti ments by principal compor	(s) by multivaria al and canonic nents analysis ar				
Pre-requisites	Pass in STAT2301 or STAT2804						
Offer in 2012 - 2013	2nd sem	Examination	Мау				
Offer in 2013 - 2014	Y						
Teaching Hours	The course consists of 36 lectures and 12 tutorials/example classes.						

Assessment Method	One 3-hour written examination (50% weighting) and a course assessment (50% weighting) based on assignments, tutorials and a class test					
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.					
Textbooks	Johnson, R. A. & Wichern, D. W.: Applied Multivariate Statistical Analysis (Prentice-Hall, 2007, 6th edition)					
References	Mardia K. V., Kent J. T., and Bibby J. M.: Multivariate Analysis (Academic Press, 1979) Seber G. A. F.: Multivariate Observations (John Wiley & Sons, 1984) Morrison D. F.: Multivariate Statistical Methods (McGraw-Hill, 1990, 3rd ed.) Hair J. F., Anderson R. E., Tatham R. L., & Black W. C.: Multivariate Data Analysis (Prentice-Hall, 2006, 6th edition) Srivastava M. S.: Methods of Multivariate Statistics (John Wiley and Sons, 2002) SAS Manuals on-line: Use the HELP button.					
Course Website	webct.hku.hk					

STAT3303 Derivativ	es and risk	management (6 credits)	Academic Year	2012			
Offering Department	Statistics a	nd Actuarial Science	Quota				
Course Co-ordinator	Dr R W L V	Vong, Statistics and Actuarial Science					
Course Aim	Nowadays all risk managers must be well versed in the use and valuation of derivatives. The two basic types derivatives are forwards (having a linear payoff) and options (having a non-linear payoff). All other derivatives ca be decomposed to these underlying payoffs or alternatively they are variations on these basic ideas. This cours aims at demonstrating the practical use of financial derivative in risk management. Emphases are on pricing ar hedging strategies, and the concept of no-arbitrage.						
Course Contents	of forward European the Black- hedging ar	Review of futures, forwards and options and the concept of no arbitrage; hedging strategies using futures; pricing of forward and futures; interest rate futures and swaps; trading strategies using options; put-call parity; valuation of European and American options using the binomial-tree model; valuation of European and American options using the Black-Scholes option pricing model; the Greeks: their calculation and interpretation; implied volatility; detta hedging and the role of market-makers; exotic options: Asian options, barrier options, compound options, gap options and exchange options.					
Learning Outcomes	- use future - determine - explain he	sful completion of the course, students should be able to: e, forwards, options and swaps to formulate financial strategie e the payoff and the value of various derivative products using by derivative products can be used as tools to manage finan- e how to decompose complicated derivatives into a profolio of	g binomial tree and Black cial risk.	-Sholes formula;			
Pre-requisites	Not for BSG Not for stud Not for stud Not for stud	AT2315; and c(Actuarial Science) students; and dents who have passed in STAT2812, or have already enrolle dents who have passed in STAT2820, or have already enrolle dents who have passed in FINA0301, or have already enrolle dents who have already passed in STAT3308 before.	ed in this course; and				
	Not for BSG Not for stud Not for stud Not for stud	c(Actuarial Science) students; and dents who have passed in STAT2812, or have already enrolle dents who have passed in STAT2820, or have already enrolle dents who have passed in FINA0301, or have already enrolle	ed in this course; and	Dec			
Offer in 2012 - 2013	Not for BSe Not for stue Not for stue Not for stue Not for stue	c(Actuarial Science) students; and dents who have passed in STAT2812, or have already enrolle dents who have passed in STAT2820, or have already enrolle dents who have passed in FINA0301, or have already enrolle	ed in this course; and d in this course; and	Dec			
Offer in 2012 - 2013 Offer in 2013 - 2014	Not for BSG Not for stud Not for stud Not for stud Not for stud 1st sem Y	c(Actuarial Science) students; and dents who have passed in STAT2812, or have already enrolle dents who have passed in STAT2820, or have already enrolle dents who have passed in FINA0301, or have already enrolle	ed in this course; and d in this course; and	Dec			
Offer in 2012 - 2013 Offer in 2013 - 2014 Teaching Hours	Not for BSG Not for stud Not for stud Not for stud Not for stud Ist sem Y The course One 2-hou	c(Actuarial Science) students; and dents who have passed in STAT2812, or have already enrolle dents who have passed in STAT2820, or have already enrolle dents who have passed in FINA0301, or have already enrolle dents who have already passed in STAT3308 before.	ed in this course; and d in this course; and Examination				
Offer in 2012 - 2013 Offer in 2013 - 2014 Teaching Hours Assessment Method	Not for BSG Not for stud Not for stud Not for stud Not for stud Ist sem Y The course One 2-hou	c(Actuarial Science) students; and dents who have passed in STAT2812, or have already enrolle dents who have passed in STAT2820, or have already enrolle dents who have passed in FINA0301, or have already enrolle dents who have already passed in STAT3308 before.	ed in this course; and d in this course; and Examination				
Pre-requisites Offer in 2012 - 2013 Offer in 2013 - 2014 Teaching Hours Assessment Method Course Grade Grade Descriptors	Not for BSG Not for stud Not for stud Not for stud Not for stud The sem Y The course One 2-hou tutorials an	c(Actuarial Science) students; and dents who have passed in STAT2812, or have already enrolle dents who have passed in STAT2820, or have already enrolle dents who have passed in FINA0301, or have already enrolle dents who have already passed in STAT3308 before.	ed in this course; and d in this course; and Examination nt (25% weighting) based ledge and skills required for a thinking, with evidence of origin	d on assignments ttaining all the course ral thought, and ability			
Offer in 2012 - 2013 Offer in 2013 - 2014 Teaching Hours Assessment Method Course Grade	Not for BSG Not for stud Not for stud Not for stud Not for stud Ist sem Y The course One 2-hou tutorials an A+ to F	c(Actuarial Science) students; and dents who have passed in STAT2812, or have already enrolle dents who have passed in STAT2820, or have already enrolle dents who have passed in FINA0301, or have already enrolle dents who have already passed in STAT3308 before. e consists of 36 lectures and 12 tutorials/example classes. r examination (75% weighting) and a coursework assessme d a class test Demonstrate thorough mastery at an advanced level of extensive know learning outcomes. Show strong analytical and critical abilities and logical to apply knowledge to a wide range of complex, familiar and unfamiliar	ed in this course; and d in this course; and Examination nt (25% weighting) based ledge and skills required for at thinking, with evidence of origin situations. Apply highly effecti kills required for attaining at lea d logical thinking, and ability t	d on assignments ttaining all the course nal thought, and ability ve organizational and ast most of the course			
Offer in 2012 - 2013 Offer in 2013 - 2014 Teaching Hours Assessment Method Course Grade	Not for BSG       Not for study       Ist sem       Y       The course       One 2-hou       tutorials and       A+ to F	<ul> <li>c(Actuarial Science) students; and dents who have passed in STAT2812, or have already enrolle dents who have passed in STAT2820, or have already enrolle dents who have passed in FINA0301, or have already enrolle dents who have already passed in STAT3308 before.</li> <li>consists of 36 lectures and 12 tutorials/example classes.</li> <li>r examination (75% weighting) and a coursework assessme d a class test</li> <li>Demonstrate thorough mastery at an advanced level of extensive know learning outcomes. Show strong analytical and critical abilities and logical to apply knowledge to a wide range of complex, familiar and unfamiliar presentational skills.</li> <li>Demonstrate substantial command of a broad range of knowledge and s learning outcomes. Show evidence of analytical and critical abilities and</li> </ul>	ed in this course; and d in this course; and Examination Examination nt (25% weighting) based thinking, with evidence of origin situations. Apply highly effection kills required for attaining at lead d logical thinking, and ability to presentational skills.	d on assignments ttaining all the course hal thought, and ability ve organizational and ast most of the course o apply knowledge to f the course learning			

	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.				
Textbooks	Hull, J. C.: Options, Futures, and Other Derivatives (Prentice Hall, 2009, 7th edition), Chapters 3, 5-7, 9-11, 13, 17-18, 24.				
References	McDonald, R. L.: Derivatives Markets (Addison Wesley, 2006, 2nd edition), Chapters 1-2, 4-5, 7-14, 23. Hull, J.C.: Risk Management and Financial Institutions (Pearson Higher Education, 2010, 2nd edition)				
Course Website	webct.hku.hk				

STAT3304 Compute	r-alded Sta	tatistica	i modelling (6	crealts)			Academic Year	2012
Offering Department	Statistics	s and Actu	arial Science				Quota	60
Course Co-ordinator	Dr G Tian	n, Statistio	cs and Actuarial	Science				
Course Aim	This is a computer-aided course of statistical modelling designed for students who have taken STAT2301 Linear Statistical Analysis and like to see theory illustrated by practical computation. Rea data sets will be presented for modelling and analysis using statistical software SAS for gaining hands-on experience. The course aims to develop skills of model selection and hypotheses formulation so that questions o interest can be properly formulated and answered. An important element deals with model review and improvement, when one's first attempt does not adequately fit the data.							
Course Contents	Simple sta Regressic Analysis	Descriptive statistics and presentation of data for nominal and continuous data; Simple statistical analyses for the one-sample and two-sample case using parametric and nonparametric methods; Regression analyses: Model Fitting; Regression analyses: Variable Selection and Model Diagnostic Checking; Analysis of Variance (ANOVA): 1-way, Two-Way and Higher-Way ANOVA; Covariance analysis; Logistic Regression.						
Learning Outcomes	- apply SA - use adva - use the I - use the o	On successful completion of the course, students should be able to: - apply SAS SQL to access data to perform queries - use advanced SAS programming statements and techniques to solve complex problems - use the BY statement for parallel processing to aid automation - use the output dataset without printing to OUTPUT windows for piping idea in automation - use SAS MACRO to develop customized and automated applications.						
Pre-requisites			1 or STAT2804; a ho have passed		, or have alrea	ady enrolled in th	iis	
Offer in 2012 - 2013	2nd sem	I					Examination	May
Offer in 2013 - 2014	Y							
Teaching Hours	The cours	rse consis	ts of 36 lectures	and 12 tutoria	als/example cl	asses.		
Assessment Method			en examination ( rials, and class te		ng) and a co	oursework asse	ssment (50% weig	hting) based on
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 abilit 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	Lack of		al abilities, logica	al and coherent th	ninking. Show very I	for attaining the course ittle or no ability to applive.	
Textbooks	On-line do	documents	s of the adopted	statistical soft	ware			
References	Approach Cody, R.F Language Dilorio, F. Press. Elliott, R.J Myers, R.	h, 2nd edi .P. & Smit ge, 4th edi F.C. & Har .J. (2000). R.H. (1990	O'Connell, R.T. ition, PWS-Kent P h, J.K. (1997). Ar tion, North-Hollar dy, K.A. (1996). ( . Learning SAS ir )). Classical and I	Publishing Co pplied Statisti nd. Quick Start to n the Comput	ompany. cs and the SA o Data Analysi er Lab, 2nd ec	S Programming s with SAS, Dux dition, Duxbury F	bury Press.	
Course Website			ning Company.					
Course Website	webct.hku	u.nk						

STAT3306 Selected t	Academic Year	2012	
Offering Department	Statistics and Actuarial Science	Quota	
Course Co-ordinator	Prof S M S Lee, Statistics and Actuarial Science		

Course Aim	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	<ol> <li>Basic a theorems;</li> <li>Parame signed like</li> <li>Nonpar: density est</li> <li>Robust</li> <li>Comput</li> <li>Sequent</li> <li>Model s</li> </ol>	is will be chosen from the following topics symptotic methods: modes of converge lelta method; Edgeworth expansions; sac ic and nonparametric likelihood methods hood ratio statistics; empirical likelihood. metric statistical inference: sign and ran mation; kernel methods. nethods: measures of robustness; M-estir tionally-intensive methods: cross-validati al analysis: sequential probability ratio ter lection using information criteria. ics as determined by the instructor.	nce; stochastic orders; dlepoint approximations : high-order approximati k tests; Kolmogorov-Sm nator; L-estimator; R-est on; bootstrap; permutatic	ions; profile likelihoo nirnov test; nonpara timator; estimating f on methods.	od and its variants; metric regression;			
Learning Outcomes	<ul> <li>comprehe</li> <li>understat</li> <li>apply a v</li> </ul>	ful completion of the course, students sh nd the language and technicalities found d the use of standard mathematical tools riety of research tools to solve standard s osure to some developments in contemp	in statistical research lite for conducting statistical tatistical problems;	I research;				
Pre-requisites	Pass in ST	T2301 or STAT2804. This course is mut	ually exclusive to STATE	6009.				
Offer in 2012 - 2013	1st sem			Examination	Dec			
Offer in 2013 - 2014	Υ	Y						
Teaching Hours	The course	The course consists of 36 lectures and 12 tutorials/example classes.						
Assessment Method		r written examination (75% weighting) s and a class test	and a coursework asso	essment (25% we	ghting) based on			
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. 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 know Show evidence of some coherent and logical thi apply knowledge to solve problems. Apply limited	nking, but with limited analytic	cal and critical abilities.	Show limited ability to			
	Fail	Demonstrate little or no evidence of command or Lack of analytical and critical abilities, logical and	coherent thinking. Show very	little or no ability to appression of the second s				
	1 all	problems. Organization and presentational skills a	e minimally ellective of mene	ctive.				
References	DasGupta Efron, B. a Owen, A.B Shao, J. (1	problems. Organization and presentational skills a A. (2008). Asymptotic Theory of Statistics d Tibshirani, R.J. (1993). An Introduction (2001). Empirical Likelihood. Chapman & 999). Mathematical Statistics. Springer: N n, L. (2006). All of Nonparametric Statistic	and Probability. Springe to the Bootstrap. Chapn Hall: Boca Raton. ew York.	er:.	rk.			

STAT3316 Advance	d probability (6 credits)	Academic Year	2012				
Offering Department	Statistics and Actuarial Science Quota						
Course Co-ordinator	Prof Y Lam, Statistics and Actuarial Science						
Course Aim	This course provides an introduction to measure theory and probability concepts in theoretical probability which are important for students to do and statistics.						
Course Contents	sigma-algebra, measurable space, measure and probability, measure s functions, random variables, integration theory, characteristic functions, c spaces, conditional expectation, martingales.						
Learning Outcomes	<ul> <li>On successful completion of the course, students should be able to:</li> <li>Understand the fundamental measure theory and probability theory.</li> <li>Learn the general concept of integration, understand the monotone co dominated convergence theorem.</li> <li>Understand the concept of conditional expectation.</li> <li>Have some elementary knowledge of martingale.</li> </ul>	nvergence theorem, F	atou's lemma and				
Pre-requisites	Pass in STAT2303 or STAT2803. This course is mutually exclusive to STA	AT6010.					
Offer in 2012 - 2013	1st sem Examination Dec						
Offer in 2013 - 2014	Y						
Teaching Hours	The course consists of 36 lectures and 12 tutorials/example classes.						
Assessment Method	One 2-hour examination (50% weighting) and a coursework assessment tutorials and a class test, etc.	(50% weighting) base	d on assignments,				

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 knowledge and skills required for attaining some 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.
References	Chow Y. H	d and Philip Protter: Probability Essentials (Universitext, Springer-Verlag, New York, 2004, 2nd edition) I. and Teicher H.: Probability Theory (Springer-Verlag, New York, 1997, 3rd edition) L.: A Course in Probability Theory (Academic Press, 2001, 3rd edition)
Course Website	webct.hku	.hk

STAT3317 Computa	lional stat	ausuc		unsj							
Offering Department	Statistics and Actuarial Science Quota										
Course Co-ordinator	Dr G Tian, Statistics and Actuarial Science										
Course Aim	computation	ationall	ally-intensiv	e methods i	n statistics	s. It emph	asizes the	role of con	tatistics a backg mputation as a fu stical theory and m	ndamental to	
Course Contents	resampling techniques maximizat importance	Generation of random variables including the inversion method, the grid method, the sampling/importance resampling method, the stochastic representation method, and the conditional sampling method; Optimization techniques including Newton's method, expectation-maximization (EM) algorithm and its variants, and minorization-maximization (MM) algorithms; Integration including Laplace approximations, Riemannian simulation, the importance sampling method and variance reduction techniques; Markov chain Monte Carlo methods including data augmentation algorithm, Gibbs sampler, and the exact inverse Bayes formulae sampling; Bootstrap methods.									
Learning Outcomes	<ul> <li>understa integration</li> <li>realize th and apply</li> <li>understa range of a</li> <li>apply EN posteriors</li> <li>apply B</li> </ul>	tand the on and the a ly then stand t f applic EM-typ r samp Boots	the import advantage advantage the esser lication, an ype algorith tples; tstrap me	pping method s and disady neralized line ice and basis d apply them ims to find th	echnique ds; vantages c ear models c principle to solve p ne posteric ain estima	for genera of the New ; e of the El ractical pro or mode an ated stand	ting random ton-Raphso M-type algo oblems; nd apply Ma dard errors	on algorith rithms and arkov chair	in Bayesian stati m and the Fisher d MM-type algorit n Monte Carlo me ators and confide	scoring algo hms, realize thods to gen	orithm theii ierate
Pre-requisites	Pass in ST	STAT2	T2301. Thi	s course is m	utually exc	clusive to S	STAT6011.				
Offer in 2012 - 2013	1st sem								Examination	Dec	
Offer in 2013 - 2014	Y	Υ									
Teaching Hours	The course consists of 36 lectures and 12 tutorials/example classes.										
Assessment Method	One 2-hou practical w				nting) and	a coursew	ork assess	ment (50%	weighting) based	d on assignm	ents
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 learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, a to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organization presentational skills.						nal thought, and	ability			
	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.										
	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.									
	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.										
Textbooks				l Ng, K.W: E & Hall/CRC,			ta Problem	is: EM, Da	ata Augmentation	and Non-iter	rative
References					Givens, G.H. and Hoeting, J.A.: Computational Statistics (Wiley, 2005) Robert, C.P. and Casella, G.: Monte Carlo Statistical Methods (Springer, 2005, 2nd edition)						
		webct.hku.hk									

STAT3319 Statistics project (12 credits)				Academic Year	2012			
Offering Department	Statistics a	d Actuarial Science	C	Quota	15			
Course Co-ordinator	Prof S M S	Prof S M S Lee, Statistics and Actuarial Science						
Course Aim		a few projects suitable for Statistics or Ris h practical experience in approaching a real						
Course Contents		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.						
Learning Outcomes	<ul> <li>gain first-</li> <li>develop</li> <li>statistical re</li> <li>write succe</li> </ul>	iul completion of the course, students should and experience in solving a research or app kills in important technical tools, including search and data analyses; nct reports on the findings of a research stud ise oral presentation of the findings of a rese	lied problem in statistics the use of computer dy;					
Pre-requisites		T2301; and ents who have already enrolled in STAT231	8 in this academic year					
Offer in 2012 - 2013	Year long		E	Examination	No Exam			
Offer in 2013 - 2014	Y	Υ						
Teaching Hours	The studer	is expected to meet and discuss with a supe	ervisor regularly in the c	ourse of the proj	ect.			
Assessment Method	Written rep	rt (50%), oral presentation and participation	(50%)					
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.]							
	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. 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 Website	webct.hku.	k						
Remarks	Approval is subject to past academic performance. This course is offered solely to students majoring in statistic or risk management admitted in 07-08 or thereafter.							

STAT3320 Risk mar credits)	agement and Basel Accords in banking and finance (6	Academic Year	2012				
Offering Department	Statistics and Actuarial Science Quota						
Course Co-ordinator	Mr P K Y Pang, Statistics and Actuarial Science						
Course Aim	To provide comprehensive knowledge and in-depth understanding of ris industry to students. The focus is on management with basic measurem course. Accordingly, minimal background in quantitative methods will l financial product (eg: bonds, swaps, options) knowledge will be required	ent fundamentals only for be required and involved	rming a part of th				
Course Contents	The course introduces and explains: - the importance of risk management, - risk nature and types, - design and establishment of a risk management framework, - the importance of people and corporate culture, - the complete risk management cycle, - measurement and management of credit, market and operational risks - Basel accords and the capital treatments for credit, market and operational - key developments (eg: Know-Your-Customers, Anti-Money laundering, - the importance of business continuity, - design and implementation of a business continuity plan.	onal risks,	itical issues,				
Learning Outcomes	On successful completion of the course, students should be able to (in th - understand the importance, nature and classification of various risks cycle, - design and establish a risk management framework, - demonstrate knowledge and understanding of the measurements of crr - explain and describe Basel accords and its capital treatments for credit	s, and the risk managem edit, market and operatio	nent principle and				

	- apprecia	te the importance of, design and implement a business	s continuity plan.					
Pre-requisites	Pass in STAT2812 or STAT2820 or STAT2808 or STAT3303 or STAT3308 or FINA0301; and Not for students who have already passed in STAT2320 before.							
Offer in 2012 - 2013	2nd sem Examination May							
Offer in 2013 - 2014	Y							
Feaching Hours	The cours	e consists of 36 lectures and 12 tutorials/example class	ses.					
Assessment Method		ur examination (60% weighting) and a coursework ass nd a class test	sessment (40% weighting) base	d on assignment				
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.						
	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.							
<b>Fextbooks</b>	TBC							
References	Jorion, P. Hull, J. C.	1., Galai, D. and Mark, R.: The Essentials of Risk Mana Financial Risk Manager Handbook + Test Bank: FRM Risk Management and Financial Institutions (Pearson Risk Management and Capital Adequacy (McGrawHil)	part I/Part II (Wiley, 2010, 6th e Higher Education, 2010, 2nd ed					
Course Website	webct.hku	ı.hk						

STAT3321 Credit ris	sk analysis	(6 credits)	Academic Year	2012				
Offering Department	Statistics a	Statistics and Actuarial Science Quota						
Course Co-ordinator	Mr K P Wa	t, Statistics and Actuarial Science						
Course Aim	other coun change in measuring	mercial bank, credit risk has always been the most significant. terparty instruments. Credit risk may also result from a change the counterparty's creditworthiness. This course will introdu and managing credit risk. It also aims to provide students v gy used in the financial industry and the regulatory framework in	in the value of an assoce students to quanti with an understanding	et resulting from a tative models for of the credit risk				
Course Contents	internal ra	es of default, recovery rates and loss given default; Default a ting models; Credit portfolio models such as CreditMetrics, Credit derivatives.						
Learning Outcomes	<ul> <li>understar</li> <li>estimate</li> <li>understar</li> <li>mortality m</li> <li>understar</li> <li>estimate</li> </ul>	sful completion of the course, students should be able to: nd the Basel requirements for credit risk; credit scores using the logit model; nd and estimate default probabilities using various approach tethod; nd the concept of credit value-at-risk and the CreditMetrics appr default correlations; ting systems.		the KMV and the				
Pre-requisites	Pass in ST one of thes	TAT2812 or STAT3303 or STAT3308 or STAT2808 or STAT2 se courses.	820 or FINA0301, or a	Iready enrolled in				
Offer in 2012 - 2013	2nd sem		Examination	May				
Offer in 2013 - 2014	Y							
Teaching Hours	The course	appoints of 26 lectures and 12 tutorials/avample alecano						
reasting nours		e consists of 36 lectures and 12 tutorials/example classes.						
Assessment Method	One 2-hou	r examination (60% weighting) and a coursework assessment d class test(s).	(40% weighting) based	d on assignments				
Assessment Method	One 2-hou	r examination (60% weighting) and a coursework assessment	(40% weighting) based	d on assignments				
	One 2-hou tutorials an	r examination (60% weighting) and a coursework assessment	ge and skills required for at nking, with evidence of origin	taining all the course				
Assessment Method Course Grade	One 2-hou tutorials an A+ to F	r examination (60% weighting) and a coursework assessment d class test(s). Demonstrate thorough mastery at an advanced level of extensive knowled learning outcomes. Show strong analytical and critical abilities and logical thi to apply knowledge to a wide range of complex, familiar and unfamiliar sit	ge and skills required for at nking, with evidence of origin uations. Apply highly effectiv s required for attaining at lea gical thinking, and ability to	taining all the course al thought, and ability e organizational and ist most of the course				

	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.
References	M. Crouhy, D. Galai & R. Mark: Risk Management (McGraw-Hill, 2001)
	<ul> <li>A. Resti &amp; A. Sironi: Risk Management and Shareholders' Value in Banking: From Risk Measurement Models to Capital Allocation Policies (Wiley, 2007)</li> <li>A. Saunders &amp; L. Allen: Credit Risk Measurement In and Out of the Financial Crisis: New Approaches to Value at Risk and Other Paradigms (Wiley, 2010, 3rd Edition)</li> <li>G. Loffler &amp; P. N. Posch: Credit Risk Modeling using Excel and VBA (Wiley, 2010, 2nd edition)</li> <li>J. R. Bohn &amp; R. M. Stein: Active Credit Portfolio Management in Practice (Wiley, 2009)</li> <li>C. W. Smithson: Credit Portfolio Management (Wiley, 2003)</li> <li>D. N. Gujarati &amp; D. C. Porter: Basic Econometrics (McGraw-Hill, 2009, 5th edition)</li> <li>J. C. Hull: Risk Management and Financial Institutions (Prentice Hall, 2010, 2nd edition)</li> </ul>
Course Website	webct.hku.hk
Remarks	References - Cont'd J. C. Hull: Options, Futures, and Other Derivatives (Prentice Hall, 2012, 8th edition)

	sk analysis (6 credits)									Academ	nic Year	201	2
Offering Department	Statistics a	and A	ctuarial Sc	ience						Quota			
Course Co-ordinator	Dr Z Zhan	Dr Z Zhang, Statistics and Actuarial Science											
Course Aim	methods f	for me	easuring ri	sk, partic	ularly V	√alue-at-	Risk (V	aR). Thi	s course	introduces	modern	risk m	tion of new nanagemen nodels, and
Course Contents	factor ma	apping		ed VaR	models	GÄRC	CH-type	models,	extreme				ulation); Ris al-mixture)
Learning Outcomes	<ul> <li>Understa</li> <li>Compute</li> <li>Model vo</li> <li>Understa</li> </ul>	tand Va te VaR rolatility tand ex	completion aR and expect and expect y using GA xtreme-valut acktesting a	bected sh cted short RCH-type ue theory,	iortfall a tfall, e model , and	as risk m Is,			:				
Pre-requisites			1001 or FIN 812 or STA					her cours	se.				
Offer in 2012 - 2013	2nd sem									Examin	ation	Мау	y
Offer in 2013 - 2014	Y												
Teaching Hours	The course	se con	sists of 36	lectures :		tutoriolo	/ovompl	م داءدوم	5.				
				100101001	and 121	lutonais	example	5 0103300					
Assessment Method	One 2-hou tutorials ar						•			)% weight	ing) base	d on a	issignments
							•			)% weight	ng) base	d on a	ssignments
Assessment Method Course Grade Grade Descriptors	tutorials ar	Dem learn to a	nonstrate tho	60% weig rough mast s. Show str lge to a wig	ghting) a tery at an rong analy	and a co n advance	d level of critical abi	rk asses extensive lities and lo	sment (40 knowledge	and skills rea	quired for at	taining nal thoug	all the course ght, and ability
Course Grade	tutorials ar A+ to F	Dem learn to a pres Dem learn	nonstrate tho ning outcome apply knowled sentational sk nonstrate sub	60% weig rough mast is. Show str lge to a wid ills. stantial cor es. Show e	ghting) a tery at an rong analy de range mmand of vidence o	and a contract of a broad of analytic	d level of critical abi ex, familia	rk asses extensive lities and lo r and unfar nowledge a tical abilitie	sment (4( knowledge gical thinkir niliar situati and skills re s and logic	and skills rea g, with evide ons. Apply h quired for att al thinking, a	quired for at nce of origin ighly effection aining at lea and ability to	ttaining hal thoug ve organ	all the course ght, and ability nizational and t of the course
Course Grade	tutorials ar       A+ to F	Dem learn to a pres Dem learn fami	nonstrate tho ming outcome apply knowlec sentational sk nonstrate sub ning outcome illiar and some nonstrate ger	60% weig rough mast is. Show str Ige to a wid ills. stantial cor es. Show e e unfamiliar heral but in evidence o	ghting) a tery at an rong analy de range mmand of vidence c situations iccomplete of some a	and a control of a control of a control of a control of analytic of a control of analytic of a contro	d level of critical abi ex, familiar range of k al and cri ffective org d of know and critical	rk asses extensive lities and lo and unfar nowledge a tical abilities ganizationa ledge and abilities a	sment (40 knowledge gical thinkir miliar situati and skills re s and logic l and prese skills requi nd logical th	and skills ree ig, with evide ons. Apply h quired for atta at thinking, a tational skill red for attain inking, and a	quired for at nce of origin ighly effection aining at lea and ability to s.	ttaining nal thoug ve organ ast most o apply f the co	all the course ght, and ability nizational and t of the course knowledge to purse learning yledge to most
Course Grade	tutorials ar       A+ to F       A       B	and a C Dem learn to a pres Dem learn fami Outc fami Dem Sho	nonstrate tho ming outcome apply knowled sentational sk monstrate sub monstrate gen monstrate gen monstrate gar monstrate gar	60% weig rough mast is. Show str ige to a wici ills. isstantial corn ss. Show er e unfamiliar neral but in evidence o s. Apply mon tial but limit of some col	ghting) a tery at an rong analy de range mmand of vidence c situations incomplete of some a derately e aed comm. herent an	and a contract of the second s	d level of critical abi x, familia range of k al and cri ffective or d of know and critical rganizatior owledge a thinking, t	rk asses extensive lities and k and unfar nowledge tical abilities panizationar ledge and abilities a nal and pre nd skills re ut with lim	sment (4( knowledge igical thinkir miliar situati and skills re s and logical l and preser skills requi d logical th sentational quired for al ted analytic	and skills rea g, with evide ons. Apply h quired for att al thinking, a ttational skill red for attair inking, and a skills. taining some al and critic:	quired for at nce of origin ighly effective and ability to s. hing most o ability to app of the coun- al abilites. S	ttaining hal thoug ve organ ast most b apply f the co bly know se learn Show lin	all the course ght, and ability nizational and t of the course knowledge to purse learning
Course Grade	tutorials ar       A+ to F       A       B       C	and a c Dem lean to a pres Dem lean fami dean fami Dem spla Dem appla Dem Lack	class test monstrate tho ming outcome apply knowled sentational sk monstrate sub monstrate ger comes. Show illiar situations monstrate par comes. Show wevidence of ly knowledge monstrate little	60% weig rough mast s. Show str igle to a wid ills. stantial cor s. Show et a unfamiliar neral but in evidence o b. Apply mou tial but limit of some col to solve pro a or no evici a land critice	tery at an rong analy de range mmand of vidence c situations complete of some a derately e ed comm- herent an oblems. A dence of al abilities	and a complete hadvance ytical and of complete f a broad of analytical s. Apply e e comman analytical a effective o hand of knin d logical Apply limite commance s, logical a	d level of critical abi ex, familiar range of k al and cri ffective org d of know ind critical rganization powledge a thinking, t ad or barel I of knowlin nd cohere	rk asses extensive lities and lo and additional rowledge and abilities and abilities a abilities a abi	knowledge gical thinkin miliar situati and skills requi and skills requi and logical the sentational si quired for at ited analytic organizatior ikills require.	and skills ree reg, with evide ons. Apply h quired for attain attational skill red for attain inking, and a skills. taining some ral and critic: ral and prese d for attaining little or no a	quired for an ince of origin ighly effectiv aining at lea and ability to s. hing most o ability to app of the cours ntational ski ing the cours	ttaining hal thoug ve organ sst most o apply f the co by know se learn Show lin Ils.	all the course ght, and ability nizational and t of the course knowledge to purse learning yledge to mos
Course Grade	tutorials ar A+ to F A B C D Fail Jorion, P.: Alexander Alexander	Derr learn to a pres Derr learn fami Derr Shoi appl Derr Lack prob	class test monstrate tho rning outcome apply knowled sentational sk monstrate sub monstrate sub monstrate ger comes. Show illiar situations monstrate par w evidence o ly knowledge k of analytica	60% weig rough mast s. Show str lge to a wici ills. stantial cor s. Show er e unfamiliar neral but in evidence o s. Apply moo to solve pro a or no evic tand critica zation and The New dels: A Gi < Analysis < Analysis	tery at an rong analy de range mmand of vidence c situations complete of some a derately e ked comm. herent an oblems. A dence of al abilities Benchn uide to I s: Practi s: Value	and a control of a complete state of a complete state of a complete state of a complete state of analytical and of analytical and of analytical a comman analytical a comman do logical Apply limite commance state of a commance state of a complete	d level of critical abia ex, familia range of k al and cri ffective or d of know ind critical ganization owledge a thinking, b d or barel of knowl nd cohere s are minir Managin Il Data A nncial Ec Models	rk asses extensive lities and lo and unfar nowledge and abilities a abilities	knowledge gjcal thinkir miliar situati and skills re s and logic l and prese skills requin d logical th sentational sentational quired for at ited analytic organizatior kills require. Show very ve or ineffe cial Risk ( Wiley, 20 ics (Wiley 2009)	and skills ree log, with evide ons. Apply h quired for atta at thinking, a tational skill reed for attain inking, and a skills. taining some al and critic. taining some al and critic. d for attaining little or no a stive. McGraw-H D1)	quired for at nce of origin ighly effectiv aining at lea and ability to s. ning most o ability to app of the cours intational ski ing the cours bility to app	ttaining hal thoug ve organ ast most o apply f the co by know se learn lls. se learni lls.	all the course ght, and ability nizational and t of the course knowledge to burse learning vledge to mos ning outcomes nited ability to ing outcomes ledge to solve

STAT3323 Current to	opics in risk management (6 credits)	Academic Year	2012
Offering Department	Statistics and Actuarial Science	Quota	

Course Co-ordinator	Head of D	Dept, Statisti	cs and Actuarial Scie	ence			
Course Aim	This course is to broaden the students knowledge of risk management by considering current topics in risk management. These topics will build on the theory and methods covered in the core courses. The topics offered each year depend on staff availability.						
Course Contents	Liquidity risk mana		III and beyond; Op	erational risk; Mode	I risk; Cutting e	dge risk analytics	and innovations in
Learning Outcomes	- gain insi - understa	sights into cur tand current r	etion of the course, s rrent advances in ris isk management pitl of models and techni	k management falls and developme	nt	risk	
Pre-requisites	Pass in S	STAT3301					
Offer in 2012 - 2013	Not offere	ed				Examination	Мау
Offer in 2013 - 2014	Y						
Teaching Hours	The cours	rse consists c	of 36 lectures and 12	tutorials/example c	lasses.		
Assessment Method		our examinati and class tes	ion (40% weighting) t(s)	and a coursework	assessment (60	% weighting) base	ed on assignments,
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	Show evide	te partial but limited comr ence of some coherent a ledge to solve problems.	nd logical thinking, but v	with limited analytic	al and critical abilities.	Show limited ability to
	Fail	Lack of ana	te little or no evidence of alytical and critical abilitie Drganization and presenta	s, logical and coherent t	hinking. Show very	little or no ability to app	
References	Fiedler, R Franzetti, Basel Co standards Basel Co	R.: Liquidity N i, C.: Operatic ommittee on ls and monito	Market Risk. 2nd Edi Modelling. (Risk Bool nal Risk Modeling a Banking Supervisi ring (BIS, 2010) Banking Supervisio 5, 2010)	ks, 2011) Ind Management. (C on:Basel III: Intern	Chapman & Hall ational Framev	CRC Finance Seri	isk measurement,
Course Website	webct.hki	u.hk					

STAT3801 Advance	d life contingencies (6 credits)	Academic Year	2012
Offering Department	Statistics and Actuarial Science	Quota	
Course Co-ordinator	Dr L F K Ng, Statistics and Actuarial Science		
Course Aim	The objective of the course is to prepare students for the Non-traditional a Models for Life Contingencies (MLC) course of the Society of Actuaries. E more advanced theories of life contingencies.		
Course Contents	This course is a continuation of the materials covered in STAT2801. We s issue random variable, Benefit premium, Future loss random variable, Present value of cash flows, Expenses and asset shares.		
Learning Outcomes	<ul> <li>On successful completion of the course, students should be able to:</li> <li>understand how concepts presented for traditional life insurances and a insurances other than traditional insurances;</li> <li>understand the models used to model cash flows for basic universal life values;</li> <li>understand the models used to model cash flows of basic universal I values of the cash flows;</li> <li>understand the benefit reserve for and calculate benefit reserve for basic</li> <li>understand the relationship between expenses and gross premium and the gross premium for life insurances and annuities.</li> </ul>	insurances and calc ife insurance and cal universal life insurance	ulate contract leve culate the present res;
Pre-requisites	Pass in STAT2801, or already enrolled in this course; and For BSc(Actuarial Science) students only.		
Offer in 2012 - 2013	2nd sem	Examination	May
Offer in 2013 - 2014	Y	·	
Teaching Hours	The course consists of 36 lectures and 12 tutorials/example classes.		
Assessment Method	One 3-hour written examination (75% weighting), and a coursework a assignments and a class test	ssessment (25% we	ghting) based on
One and One de			
Course Grade	A+ to F		

# Department of Statistics & Actuarial Science

Course Website	webct.hk	u.hk
References	Dickson,	N. L. et al.: Actuarial Mathematics (Society of Actuaries, 1997, 2nd ed) C.M.D., Hardy, M.R. and Waters, H.R.: Actuarial Mathematics for Life Contingent Risks (Cambridge y Press, 2009)
	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	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 Co-ordinator         Prof H L Yang, Statistics and Actuarial Science           Course Aim         This course serves as a continuation of STAT3801 and extends the coverage to include statistical models and actuarial techniques used in the field of life and non-clife insurance. Extudents are reminded that this course is a part of the requirement for the exemption from the Subject CTS Contingencies of the Faculty and Institute of Actuaries, UK.]           Course Contents         Topic covers further analysis of the multiple decrement model; multiple state models, profit testing, asset shares; valuation for pension plans; cost of guarantees and options; applications of actuarial techniques to a wide range of insurance problems. Equity linked insurance products and valuation of these procducts.           Learning Outcomes         On successful completion of the course, students should be able to:         - value the cashflow contracts: multiple decrement tables to evaluate expected cashflows dependent upon more than one risk           - Calculate expected cashflows for whole life, endowment, term assurances, - understand bank to use multiple decrement tables to evaluate expected cashflows dependent upon more than one decrement, including: pension benefits, salary reliated benefits, health and care insurance, - understand the equity linked insurance products, and the method and idea of valuing the equity linked insurance products, and the method and idea of valuing the equity linked insurance products, and the method and idea of valuing the equity linked insurance products, and the method and idea of valuing the equity linked insurance products.           Pre-requisites         Pres SC/Actuarial Science) students only.           Offer in 2013 - 2014         Y <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th>-</th> <th></th> <th></th>								-		
Course Co-ordinator         Prof H L Yang, Statistics and Actuarial Science           Course Aim         This course serves as a continuation of STAT3801 and extends the coverage to include statistical models and actuariat techniques used in the field of life and non-tife insurance, Educations are remined that this course is a part of the requirement for the exemption from the Subject CT5 Contingencies of the Faculty and Institute of Actuariate, U.K.]           Course Contents         Topic covers further analysis of the multiple decrement model; multiple state model; disability contracts; long-term care contracts; unl-linked contracts; with profit policies; emerging costs methods; profit testing; asset shares; valuation for persion pars, cost of guarantees and options; applications of actuariat lechniques to a wide range of insurance problems. Equity linked insurance products and valuation of these products.           Learning Outcomes         On successful completion of the course, sudnets should be able to: Value the cashflow contingent upon more than one risk - Calculate expected cashflows or whole life, endowment, term assurances, annuities, and uni-linked contracts.         Examination         Dec           Offer in 2012 - 2013         1st sem         Examination         Dec         Offer in 2012 - 2014         Y           Teaching Hours         The course consists of 36 lectures and 12 tutorials/example classes.         Course or disk teal and class test         Course or disk teal and class test           Course Grade         A+ to F         Demonstrate through mastery at an advanced weld e determine reliability and hecourse anapelyoriability and reservices or displat function allit	STAT3802 Advanced	d continger	encies	6 credits)					Academic Year	2012
Course Aim         This course serves as a continuation of STAT3801 and extends the coverage to include statistical models and actuarial techniques used in the field of life and non-life insurance. [Students are reminded that this course is a part of the requirement for the experiment for the subject CTS Contingencies of the Faculty and Institute of Actuaries, UX)           Course Contents         This course starts in the field of life and non-life insurance. [Students are reminded that this course is valuation for pension plans; cost of quarantes and options; applications of actuarial techniques to a wide range of insurance problems. Equity linked insurance products and valuation of these procducts.           Learning Outcomes         On successful completion of the course, students should be able to: - Value the cashflow contingent upon more than one risk - Calculate expected cashflows for whole life, endowment, term assurances, annuities, and unit-linked contracts:         Indestand single annual premium contracts profit test and how the profit test may be used to price a product, or to determine reserves           Puderstand how to use multiple decrement tables to evaluate expected cashflows dependent upon more than one decrement, including: pension benefits, salary related benefits, health and care insurance - Understand the equity linked insurance products.         Dec           Pre-requisites         The course consists of 36 lectures and 12 tutorials/example classes.         Seesessment (25% weighting) based on assignments, tutorials and actas test           Course Grade         A + to F         B enomestate use and actas test         Examination           Course Grade         A + to F         B enomestate use and actas	Offering Department	Statistics a								
actuarial techniques used in the field of life and non-life insurance. [Students are reminded that this course is a part of the requirement for the exemption from the Subject CT5 Contingencies of the Faculty and Institute of Actuaries, UK].         Course Contents       Topic covers further analysis of the multiple decrement model; multiple state model; disability contracts; with profit policies; emerging costs methods; profit lesting; asset shares; valuation for pension plans; cost of guarantees and options; applications of actuariat techniques to a wide range of insurance products. Equity linked insurance products and valuation of these procducts.         Learning Outcomes       On successful completion of the course, students should be able to:	Course Co-ordinator	Prof H L Ya	Yang, St	Statistics and A	ctuarial Sci	ence				
care contracts; unit-linked contracts; with profit policies; emerging costs methods; profit testing; asset shares;         valuation for pension plans; cost of guarantees and options; appointed techniques to a wide range of insurance problems. Equity linked insurance products and valuation of these procducts.         Learning Outcomes       On successful completion of the course, students should be able to:         - Value the cashful wo contingent upon more than one risk       - Calculate expected cashful wo contingent upon more than one risk         - Understand simple annual premium contracts profit test and how the profit test may be used to price a product, or to determine reserves       - Understand how to use multiple decrement tables to evaluate expected cashflow dependent upon more than one decrement, including: pension benefits, salary related benefits, health and care insurance products.         Pre-requisites       Pass in STAT3801; and For BSc(Actuarial Science) students only.         Offer in 2012 - 2013       1st sem       Examination       Dec         Offer in 2012 - 2014       Y       Teaching Hours       The course consists of 36 lectures and 12 tutorials/example classes.         Assessment Method       One 3-hour written examination (75% weighting), and a coursework assessment (25% weighting) based on assignments, tutorials and a class test         Course Grade       A+ to F       Grade Descriptors       A       Demonstrate through mastery at an advanced level of outersive knowledge and skills required for attaining all the course framany incomes show evedence of ansylicial and drical abilities and l	Course Aim	actuarial te part of the	techniqu ne requi	ues used in th	ne field of li	fe and non-li	fe insurance. [Stu	dents	are reminded that	this course is a
- Value the cashflow contingent upon more than one risk     - Calculate expected cashflows for whole life, endowment, term assurances,     annuities, and unit-linked contracts     - Understand simple annual premium contracts profit test and how the profit test may be used to price a product, or     to determine reserves     - Understand simple annual premium contracts profit test and how the profit test may be used to price a product, or     to determine reserves     - Understand the equity linked insurance products, and the method and idea of valuing the equity linked insurance     products.     Pre-requisites     Pass in STAT3801; and     For BSC(Actuarial Science) students only.     Offer in 2012 - 2013     1st sem     The course consists of 36 lectures and 12 tutorials/example classes.     Assessment Method     One 3-hour written examination (75% weighting), and a coursework assessment (25% weighting) based on     assignments, tutorials and a class test     Course Grade     A+ to F     Grade Descriptors     A     bernonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course     apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and     preventional and presentational skills.     B     bernonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course     apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and     preventional skills.     Demonstrate substantial command of a broad range of knowledge and skills required for attaining at the course     action target of complex, familiar and unfamiliar situations. Apply fineded for tataining most of the course learning     outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to     tarming extremes show evidence of some analytical and critical ab	Course Contents	care contra valuation fo	tracts; u for pens	unit-linked con ision plans; cos	ntracts; with st of guarar	n profit polici ntees and op	es; emerging cost ions; applications (	ts met of actu	thods; profit testing uarial techniques to	g; asset shares;
For BSc(Actuarial Science) students only.       Examination       Dec         Offer in 2012 - 2013       1st sem       Examination       Dec         Offer in 2013 - 2014       Y       Teaching Hours       The course consists of 36 lectures and 12 tutorials/example classes.       Seessment Method       One 3-hour written examination (75% weighting), and a coursework assessment (25% weighting) based on assignments, tutorials and a class test         Course Grade       A+ to F       Earning documents and a class test       Earning and the course 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 thorough mastery at an advanced level of extensive knowledge and skills required for attaining at least most of the course learning outcomes. Show storg analytical and critical abilities and logical thinking, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.         B       Demonstrate general but incomplete command of a knowledge and skills required for attaining the set most of the course tarming outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to solve problems. Apply individa and critical abilities and logical thinking, and ability to apply knowledge to solve tramiliar and some unfamiliar situations. Apply effective organizational and presentational skills.         C       Demonstrate general but incomplete command of knowledge and skills required for attaining m	Learning Outcomes	<ul> <li>Value the</li> <li>Calculate</li> <li>annuities, a</li> <li>Understar</li> <li>to determin</li> <li>Understar</li> <li>one decren</li> <li>Understar</li> </ul>	te cashfil te expect, and un and sim ine rese tand how ement, in and the	flow contingent cted cashflows hit-linked contra hple annual pre erves w to use multi including: pens	t upon more for whole I acts emium contr iple decrem sion benefits	e than one ris ife, endowme racts profit te nent tables to s, salary rela	k ent, term assurance st and how the pro o evaluate expecte ed benefits, health	ofit tes ed cas	hflows dependent care insurance	upon more than
Offer in 2013 - 2014         Y           Teaching Hours         The course consists of 36 lectures and 12 tutorials/example classes.           Assessment Method         One 3-hour written examination (75% weighting), and a coursework assessment (25% weighting) based on assignments, tutorials and a class test           Course Grade         A+ to F           Grade Descriptors <ul> <li>Permostrate 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 though, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar and unfamiliar situations. Apply high effective organizational and presentational skills.           B         Demonstrate 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 limited oragnizational and presentational skills.           D         Demonstrate partial but incomplete command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, and ability to apply knowledge to most familiar situations. Apply limited oragnizational and presentational skills.           D         Demonstrate partial but incomplete command of knowledge and skills required for attaining some of the coure</li></ul>	Pre-requisites			,	dents only.					
Teaching Hours         The course consists of 36 lectures and 12 tutorials/example classes.           Assessment Method         One 3-hour written examination (75% weighting), and a coursework assessment (25% weighting) based on assignments, tutorials and a class test           Course Grade         A+ to F           Grade Descriptors	Offer in 2012 - 2013	1st sem							Examination	Dec
Assessment Method       One 3-hour written examination (75% weighting), and a coursework assessment (25% weighting) based on assignments, tutorials and a class test         Course Grade       A+ to F         Grade Descriptors       A         B       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 coherent and logical thinking, and ability to apply knowledge to most familiar situations. Apply inderately effective organizational and presentational skills.         D       Demonstrate partial but limited command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some coherent thinking, but with limited abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.         D       Demonstrate partial but limited command of knowledge an	Offer in 2013 - 2014	Y								
assignments, tutorials and a class test       assignments, tutorials and a class test         Course Grade       A+ to F         Grade Descriptors       A         B       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 general but incomplete 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 situations. Apply effective organizational and presentational skills.         D       Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar 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, and ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.         D       Demonstrate title or no evidence of command of knowledge and skills required for attaining outcomes. Show evidence of some coherent and logical	Teaching Hours	The course	se consi	ists of 36 lectu	ires and 12	tutorials/exa	mple classes.			
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 general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.         D       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 limi	Assessment Method					veighting), ar	nd a coursework a	asses	sment (25% weigl	nting) based on
A       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 imited or barely effective organizational and presentational skills.         D       Demonstrate itile 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.         Eal       Demonstrate general but limited command of knowledge and skills required for attaining the course learning	Course Grade	A+ to F								
B       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 most 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 most show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.         D       Demonstrate partial but limited command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities, logical and coherent thinking. Show very little or no 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 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.         Refe	Grade Descriptors	A	learnii to app	ing outcomes. Sho ply knowledge to	ow strong anal	lytical and critica	I abilities and logical thi	inking,	with evidence of origina	I thought, and ability
C       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.         References       Neill, A.: Life Contingencies (Heinemann, 1977)         Bowers, N. L. et al.: Actuarial Mathematics (Society of Actuaries, 1997, 2nd ed.)         Scott, W. F.: Life Assurance Mathematics (Heriott-Watt University, 1999)         Berin, B. N.: The Fundamentals of Pension Mathematics (Society of Actuaries, 1989)         CT5 Contingencies Core Technical Core Reading (Institute of Actuaries, 2010)         Lecture note on equity linked insurance products.		В	learnii	ing outcomes. Sh	ow evidence	of analytical an	d critical abilities and le	logical t	thinking, and ability to	
D       Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.         Fail       Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities. Jogical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.         References       Neill, A.: Life Contingencies (Heinemann, 1977)         Bowers, N. L. et al.: Actuarial Mathematics (Society of Actuaries, 1997, 2nd ed.)         Scott, W. F.: Life Assurance Mathematics (Heriott-Watt University, 1999)         Berin, B. N.: The Fundamentals of Pension Mathematics (Society of Actuaries, 1989)         CT5 Contingencies Core Technical Core Reading (Institute of Actuaries, 2010)         Lecture note on equity linked insurance products.		С	outcor	omes. Show evide	nce of some a	analytical and cr	itical abilities and logica	al think	ing, and ability to apply	
Fail       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.         References       Neill, A.: Life Contingencies (Heinemann, 1977) Bowers, N. L. et al.: Actuarial Mathematics (Society of Actuaries, 1997, 2nd ed.) Scott, W. F.: Life Assurance Mathematics (Heriott-Watt University, 1999) Berin, B. N.: The Fundamentals of Pension Mathematics (Society of Actuaries, 1989) CT5 Contingencies Core Technical Core Reading (Institute of Actuaries, 2010) Lecture note on equity linked insurance products.		D	Show	v evidence of som	ne coherent ar	nd logical thinkii	ng, but with limited ana	alytical	and critical abilities. Sh	ow limited ability to
Bowers, N. L. et al.: Actuarial Mathematics (Society of Actuaries, 1997, 2nd ed.) Scott, W. F.: Life Assurance Mathematics (Heriott-Watt University, 1999) Berin, B. N.: The Fundamentals of Pension Mathematics (Society of Actuaries, 1989) CT5 Contingencies Core Technical Core Reading (Institute of Actuaries, 2010) Lecture note on equity linked insurance products.		Fail	Lack	of analytical and	critical abilities	s, logical and co	herent thinking. Show	very litt	le or no ability to apply	
Course Website webct.hku.hk	References	Bowers, N. Scott, W. F Berin, B. N CT5 Contin	N. L. et a F.: Life N.: The tingencie	al.: Actuarial N Assurance Ma Fundamentals ies Core Techr	Nathematics athematics s of Pension nical Core F	s (Society of (Heriott-Watt n Mathematic Reading (Inst	University, 1999) s (Society of Actua	aries,	, ,	
	Course Website	webct.hku.l	u.hk							

STAT3806 Investme			-	•				Academic Year	2012
Offering Department	Statistics	s and A	Actuarial Sci	ence				Quota	
Course Co-ordinator	Head of D	Dept,	Statistics and	d Actuarial	Science				
Course Aim	in the ma	nanage	ment of an i	investment	portfolio. Empl	hasis will be	placed on		res commonly use problems faced b
Course Contents	concepts	s to in	vestment pr	actice. This		over the follo	wing topic	s: Investment Ma	ndamental actuaria nagement Process
Learning Outcomes	<ul> <li>Explain</li> <li>Identify</li> <li>Describe</li> <li>Describe</li> <li>Explain</li> <li>Describe</li> <li>Identify</li> <li>Define r</li> <li>Apply Al</li> <li>Select o</li> </ul>	n how a y the ob be how be the n princi be asso y and d risk m ALM pr or build	an investmer bligations of v to select an particular iss iples of risk-t et allocation describe finan etrics to qua rinciples to th d a benchma	nt policy and a fiduciary i in investmen sues influen based capita strategies t ncial and no ntify major t ne establish ark for a give	e, students sho d an investmen n managing inv t strategy for a cing investmen al managemen hat can be use on-financial risk ypes of risk ex ment of investr en portfolio or p easurement mo	t strategy car vestment port n individual. t strategies for t. d to construc s faced by ar posure. nent policy ar portfolio mana	n help man folios. or institutio t an asset n entity. nd strategy agement si	nal investors. portfolio. /. tyle.	
Pre-requisites		(Actua	rial Science)		nly; and INA2802, or ha	ave already e	nrolled in t	his course.	
Offer in 2012 - 2013	Not offere	red						Examination	To be confirmed
Offer in 2013 - 2014	Y								
Teaching Hours	The cours	irse cor	nsists of 36 l	ectures and	12 tutorials/ex	ample classe	es.		
Assessment Method					% weighting), ssions, project			essment (50% w	eighting) based o
Course Grade	A+ to F								
Grade Descriptors	A	lea to	arning outcomes	s. Show strong ge to a wide r	analytical and crit	cal abilities and	logical thinkin	ng, with evidence of ori	attaining all the cours ginal thought, and abilit ctive organizational and
	в	lea	arning outcomes	s. Show evide		and critical abilit	ies and logic	al thinking, and ability	east most of the cours to apply knowledge to
	с	out	tcomes. Show e	evidence of so		critical abilities	and logical th	inking, and ability to a	of the course learning pply knowledge to mos
	D	Sh	now evidence of	f some cohere	ent and logical thin	king, but with lir	nited analyti		urse learning outcomes . Show limited ability to skills.
	Fail	La	ck of analytical	and critical ab		coherent thinkin	g. Show very	little or no ability to a	urse learning outcomes
References	Z. Bodie, Crouhy, C F. J. Fabo	e, A. Ka Galai, bozzi: ł	ane, & A. Ma & Mark: Ris Handbook of	rcus: Invest k Managem f Fixed Inco	ments (McGra	w-Hill, 2005, McGraw-Hill,	7th edition 2005, 7th	edition)	999)
Course Website	webct.hku	ku.hk							

STAT3807 Fundame	entals of actuarial practice (6 credits)	Academic Year	2012				
Offering Department	Statistics and Actuarial Science Quota						
Course Co-ordinator	Dr L F K Ng, Statistics and Actuarial Science						
Course Aim	This course teaches students about the business environment and exposes using the actuarial control cycle as a framework.	them to practical re	al-world situations				
Course Contents	This course provides an overview on selected materials relating to the follo Actuary, External Forces, Risk in Actuarial Problems, Design and Pricing placed on applications to various financial security programmes includ insurance, social security plans, retirement plans, investment funds and prop	of Actuarial Solution	ns. Emphasis will insurance, group				
Learning Outcomes	On successful completion of the course, students should be able to: - Provide introductory description of financial security systems, common experiences. - Describe actuarial practices, principles, approaches, methods, commonalitie						

# Department of Statistics & Actuarial Science

	- Explain those pro - Apply ac - Provide	n actuarial oviders. actuarial sl e context f	kills in nontradition	ied directly on be nal and emerging athematical and to	ehalf of financial sec gareas of practice.	urity system providers oped in the basic actua aries.	
Pre-requisites		STAT3801 (Actuarial	1; and Science) students	s only.			
Offer in 2012 - 2013	1st sem					Examination	No Exam
Offer in 2013 - 2014	Y						
Teaching Hours	The cours	rse consis	sts of 36 lectures.				
Assessment Method	100% cou report)	oursework	assessment (25%	% in-class quizze	s or group discussio	ons, 25% oral presenta	ion and 50% written
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	Lack of	f analytical and critica	I abilities, logical and		required for attaining the co w very little or no ability to a ineffective.	
References	of Actuari Bluhm, W Brown, R	ries of Aus N. F.: Gro R. L. and	stralia, 2003) oup Insurance (AC	TEX Publication	s, 2007, 5th ed.)	ment: The Actuarial Co oss Reserving for Pro	
Course Website	webct.hku	ku.hk					
Remarks	Contracts Lam, J.: E Luenberg McGill, D.	ts (ACTEX Enterprise ger, D. G.	K Publications, inc e Risk Manageme : Investment Sciel wn, K. N., Haley,	., 2007, 2nd ed.) ent: From Incentiv nce (Oxford Univ	ves to Controls (Joh ersity Press, 1998)	of Individual Life Inst n Wiley & Sons, 2003) ntals of Private Pensior	,

STAT3809 Current to	opics in actuarial science (6 credits)	Academic Year	2012				
Offering Department	Statistics and Actuarial Science	Quota					
Course Co-ordinator	Prof W K Li, Statistics and Actuarial Science						
Course Aim	This course aims at providing practical elements for actuarial students including daily life actuarial practice and basic capability to understand, research in and handle the laws as and when situations would arise, which benefit students in their coming future career.						
Course Contents	<ul> <li>This course covers a full range of topics related to both areas includi Actuaries' Legal Thinking.</li> <li>For Practical Actuarial Practice, it covers the major practical topics in Insurance, it covers the full picture of actuarial control cycle includin Reporting and Experience Analysis. For General Insurance, it covers the and Valuation.</li> <li>For Actuaries' Legal Thinking, after a quick coverage on the "why", this future actuaries to have basic understanding of how the law operates, the as the Legal System, Contract and Tort, how to conduct preliminary leg how to interpret written judgment and current issues in the law. This pa section on studying some basic legal doctrines in the law of insurance.</li> </ul>	both Life and Casual ng Product Pricing, Va backbone areas includ condensed part of the fundamentals in core l al researches, how to	ty areas. For Life Iluation, Financia ng Product Pricin course is to hel egal subjects suc work with lawyers				
Learning Outcomes	<ul> <li>On successful completion of the course, students should be able to: <ul> <li>have a basic understanding regarding Actuarial Control Cycle from A to Z for Life Insurance and Gen Insurance;</li> <li>possess some experience regarding fundamental actuarial practice through practical project;</li> <li>possess basic understanding of the legal system in Hong Kong;</li> <li>possess fundamental knowledge in certain core legal aspects such as the law of contract and the law of tort;</li> <li>possess fundamental knowledge of the law of insurance;</li> <li>conduct elementary legal researches when facing with legal problems;</li> <li>understand the basic elements of a routine judgment, the matrix of the facts and the law involved.</li> </ul> </li> </ul>						
Pre-requisites	(Pass in STAT2801, or already enrolled in this course; or Pass in STAT3801, or already enrolled in this course); and For BSc(Actuarial Science) students only.						

Offer in 2012 - 2013	2nd sem	2nd sem Examination No Exam					
Offer in 2013 - 2014	Y						
Teaching Hours	The cour	rse consists of 36 lectures.					
Assessment Method	100% co	pursework assessment based on assignments, practical project and	class test(s)				
Course Grade	A+ to F						
Grade Descriptors	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thou to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective orga 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.					
	C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course lead outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar situations. Apply moderately effective organizational and presentational skills.						
	D	Demonstrate partial but limited command of knowledge and skills required for Show evidence of some coherent and logical thinking, but with limited analyt apply knowledge to solve problems. Apply limited or barely effective organization	ical and critical abilities.	Show limited ability to			
	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 Website	webct.hk	ku.hk					

STAT3810 Risk theo	ory (6 credi		Academic Year	2012					
Offering Department	Statistics a	nd Actuarial Science	Quota						
Course Co-ordinator	Dr K C Ch	Dr K C Cheung, Statistics and Actuarial Science							
Course Aim		Risk theory is one of the main topics in actuarial science. Risk theory is the applications of statistical models an stochastic processes to insurance problems such as the premium calculation, ruin probability, etc.							
Course Contents		Severity models; frequency models; collective risk models;coverage modifications; ruin theory; risk measures simulation.							
Learning Outcomes	<ul> <li>Understa total claim</li> <li>Estimate made in pr</li> <li>Calculate</li> </ul>	On successful completion of the course, students should be able to: - Understand the individual risk model and the collective risk model, evaluate the distribution and expectation of the total claim amounts. - Estimate the premium of a policyholder and the total claim amounts using the information of the claim amounts made in previous years. - Calculate some commonly used risk measures and explain their use and limitation. - Apply simulation methods within the context of actuarial models.							
Pre-requisites		AT2803, or already enrollec AT2303 or MATH2603	I in this course; or						
Offer in 2012 - 2013	2nd sem			Examination	May				
Offer in 2013 - 2014	Y								
Teaching Hours	The course	consists of 36 lectures and	12 tutorials/example classes.						
Assessment Method		r written examination (75 <sup>c</sup> s, tutorials and a class test	% weighting) and a coursewo , etc.	ork assessment (25% we	ighting) based on				
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	outcomes. Show evidence of so	plete command of knowledge and sk me analytical and critical abilities and tely effective organizational and presen	logical thinking, and ability to ap					
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outco Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited abil 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.							
References	2008, 3rd e Bowers, N Actuaries,	dition) L., Gerber, H.U., Hickman, 977, 2nd edition)	ot G. E.: Loss Models: From J.C., Jones, D.A. and Nesbitt, I Time (The MIT Press, 2001)	,	•				
Course Website	webct.hku.	)k							

Academic Year 2012

Offering Department	Statistics a	nd Actuarial Science	Quota						
Course Co-ordinator	Dr E K F La	Dr E K F Lam, Statistics and Actuarial Science							
Course Aim		This course is concerned with how models which predict the survival pattern of humans or other entities are established. This exercise is sometimes referred to as survival-model construction.							
Course Contents	The nature and properties of parametric and nonparametric survival models will be studied. Topics to be covered include: the introduction of some important basic quantities like the hazard function and survival function; some commonly used parametric survival models; concepts of censoring and/or truncation; parametric estimation of the survival distribution by maximum likelihood estimation method; nonparametric estimation of the survival functions from possibly censored samples by means of the Kaplan-Meier estimator, the Nelson-Aalen estimator; and the kernel density estimator or the Ramlau-Hansen estimator and comparisons of k independent survival functions by means of the generalized log-rank test; parametric regression model; Cox's semiparametric proportional hazards regression model; and multivariate survival analysis.								
Learning Outcomes	- acquire a death and l - perform e - analyze s	sful completion of the course, students should be able to: clear understanding of the nature of failure time data or su life, stimation for some commonly used survival models under urvival data using the Cox's semiparametric proportional ha e Cox's model to a multivariate setup to accommodate mul	different types of censoring azards model,						
Pre-requisites		AT2802, or already enrolled in this course; or AT2301 or STAT2801							
Offer in 2012 - 2013	2nd sem		Examination	May					
Offer in 2013 - 2014	Y								
Teaching Hours	The course	consists of 36 lectures and 12 tutorials/example classes.							
Assessment Method		rr written examination (75% weighting) and a coursework ts, tutorials and a class test	ork assessment (25% we	ghting) based on					
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 sk outcomes. Show evidence of some analytical and critical abilities and familiar situations. Apply moderately effective organizational and present	logical thinking, and ability to ap						
	D	Demonstrate partial but limited command of knowledge and skills requi Show evidence of some coherent and logical thinking, but with limite apply knowledge to solve problems. Apply limited or barely effective or	d analytical and critical abilities.	Show limited ability to					
	Is required for attaining the cour how very little or no ability to app or ineffective.								
References	Hosmer, D 1999) Klein, J. P.	and Oakes, D.: Analysis of Survival Data (Chapman and H . W. and Lemeshow, S.: Applied Survival Analysis: Regree . and Moeschberger, M. L.: Survival Analysis: Techniques w York, 2005, 2nd ed.)	ssion Modeling of Time to						
	0, -	. ,							

STAT3819 Project in	n statistics and actuarial science (6 credits)	Academic Year	2012
Offering Department	Statistics and Actuarial Science	Quota	
Course Co-ordinator	Prof S M S Lee, Statistics and Actuarial Science		
Course Aim	Each year a few projects suitable for Actuarial Science students will be offered to provide students with practical experience in approachin oral presentation.	ng a real problem, in re	eport writing and ir
Course Contents	These projects, under the supervision of individual staff members, inverprobability in a wide range of problems of practical and/or academic interest		of statistics and/or
Learning Outcomes	On successful completion of the course, students should be able to: - formulate meaningful research problems; - learn and apply advanced techniques in probability and/or statistics to so - summarize and present research findings in a professional manner.	lve real life problems;	
Pre-requisites	For BSc(Actuarial Science) students only.		
Offer in 2012 - 2013	Year long	Examination	No Exam
Offer in 2013 - 2014	Y		
Teaching Hours	No regular lectures. The student is expected to meet and discuss with a project.	supervisor regularly in	n the course of the
Assessment Method	Written report (50%), oral presentation and participation (50%)		
Course Grade	A+ to F		
Grade Descriptors			

Remarks	Approva	l is subject to past academic performance.
Course Website	webct.hl	ku.hk
	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.
	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.
	С	Demonstrate general but incomplete grasp of the subject. Evidence of some analytical and critical abilities and logical thinking. Use of relevant information from sources, showing ability to make comparisons between different interpretations and to quote/reference aptly. Mostly correct but some erroneous use of data and results to draw appropriate conclusions. Apply moderately effective organizational and presentational skills.
	В	Demonstrate substantial grasp of the subject. Evidence of analytical and critical abilities and logical thinking. Critical use of relevant information from sources, showing ability to make meaningful comparisons between different secondary interpretations and to quote/reference aptly. Correct use of data of results to draw appropriate conclusions. Apply effective organizational and presentational skills.
	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.]

	Funds and	Pension N	iathematics	(o creaits)	unds and Pension Mathematics (6 credits)				
Offering Department	Statistics and Actuarial Science						Quota		
Course Co-ordinator	Dr G Ma, S	Dr G Ma, Statistics and Actuarial Science							
Course Aim	of pension	This course covers the basics of pension plan design and pension fund management, as well as the fundament of pension plan valuations using different actuarial cost methods. The students will be introduced to the application of actuarial valuation techniques to the funding and accounting of pension plans.							
Course Contents	obligations	The following topics will be covered: Fundamentals of private pension plans; pricing and valuation of pension obligations; actuarial cost methods and their effects on cost patterns; selection of actuarial assumptions; principle of asset and liability management.							
Learning Outcomes	<ul> <li>calculate</li> <li>calculate</li> <li>perform g</li> <li>select app</li> <li>interpret t</li> </ul>	On successful completion of the course, students should be able to: - calculate the pension benefits in accordance with the provisions of a pension plan; - calculate the normal cost and actuarial liabilities using different actuarial cost methods; - perform gain and loss analyses for pension valuations; - select appropriate assumptions and methods for funding or accounting purposes; - interpret the valuation results presented in actuarial valuation reports; - develop models for asset and liability projections							
Pre-requisites		AT3801; and ctuarial Scie	d nce) students (	only.					
Offer in 2012 - 2013	1st sem						Examination	Dec	
Offer in 2013 - 2014	Y								
Teaching Hours	This course	e consists of	36 lectures ar	nd 12 tutorials/e	example classe	es.			
Assessment Method			amination (75 and a class tes	0 0/	and a course	ework asses	ssment (25% we	ghting) based o	
			•	0 0/	and a course	ework asses	ssment (25% we	ghting) based o	
Course Grade	assignmen	Demonstrate	thorough mastern omes. Show stron	y at an advanced g analytical and cr	level of extensive	knowledge ar	ssment (25% we ad skills required for a , with evidence of origi ns. Apply highly effect	ttaining all the cours nal thought, and abili	
Course Grade	assignmen A+ to F	Demonstrate learning outc to apply know presentationa Demonstrate learning outc	thorough masternomes. Show stron vledge to a wide il skills. substantial commo	tt. y at an advanced g analytical and cr range of complex nand of a broad ra lence of analytical	level of extensive itical abilities and l , familiar and unfa nge of knowledge	knowledge ar logical thinking amiliar situatior and skills requ ies and logical	nd skills required for a , with evidence of orig ns. Apply highly effect uired for attaining at le thinking, and ability	ttaining all the cours nal thought, and abili ive organizational an ast most of the cours	
Course Grade	A+ to F	Demonstrate learning outc to apply knor presentationa Demonstrate learning outc familiar and s Demonstrate outcomes. Sl	thorough mastern where the show stron vledge to a wide il skills. substantial commo ome s. Show evid ome unfamiliar sit general but inco ow evidence of s	y at an advanced g analytical and cr range of complex nand of a broad ra lence of analytical iuations. Apply effe mplete command some analytical an	level of extensive itical abilities and l , familiar and unfa nge of knowledge and critical abiliti ective organization of knowledge and	knowledge ar logical thinking amiliar situatior and skills requ les and logical al and presentä d skills require and logical thin	nd skills required for a with evidence of orig is. Apply highly effect wired for attaining at le thinking, and ability ational skills. d for attaining most of king, and ability to ap	ttaining all the cours nal thought, and abili ive organizational an ast most of the cours o apply knowledge t of the course learnin	
Assessment Method Course Grade Grade Descriptors	A+ to F A B	Demonstrate learning outc to apply kno presentationa Demonstrate learning outc familiar and s Demonstrate outcomes. SI familiar situal Demonstrate Show eviden	thorough mastern omes. Show stron vledge to a wide l skills. substantial commons. Show evid ome unfamiliar sit general but inco iow evidence of s ions. Apply model partial but limited ce of some coher	tt. y at an advanced g analytical and cr range of complex hand of a broad ra lence of analytical utations. Apply effective org command of know rent and logical th	level of extensive itical abilities and 1 , familiar and unfa nge of knowledge and critical abiliti active organization of knowledge and d critical abilities a anizational and pre vledge and skills re inking, but with lin	knowledge ar logical thinking amiliar situation and skills requies and logical al and presenta d skills require and logical thin essentational sk equired for atta nited analytical	nd skills required for a with evidence of orig is. Apply highly effect wired for attaining at le thinking, and ability ational skills. d for attaining most of king, and ability to ap	ttaining all the cours nal thought, and abili ive organizational an ast most of the cours o apply knowledge t of the course learnin oly knowledge to mo 'se learning outcome Show limited ability t	
Course Grade	A+ to F A B C	Demonstrate learning outc to apply knov presentationa Demonstrate learning outc familiar and s Demonstrate outcomes. SI familiar situat Demonstrate Show eviden apply knowle Demonstrate Lack of analy	thorough mastern mes. Show stron vledge to a wide il skills. substantial commo ome unfamiliar sit general but inco owe vidence of s ions. Apply moder partial but limited ce of some coher partial but limited idge to solve probl little or no evider tical and critical a	y at an advanced g analytical and cr range of complex nand of a broad ra lence of analytical iuations. Apply effec mplete command some analytical an rately effective org command of know rent and logical th ems. Apply limite nce of command of bilities, logical an	level of extensive itical abilities and l , familiar and unfa and critical abiliti active organization. of knowledge and d critical abilities a anizational and pre vledge and skills re inking, but with lin or barely effective of knowledge and	knowledge ar logical thinking amiliar situatior and skills requi es and logical al and presentä d skills required and logical thin esentational sk equired for atta nited analytical e organizational skills required g. Show very li	nd skills required for a with evidence of orig is. Apply highly effect uired for attaining at le thinking, and ability ational skills. d for attaining most of king, and ability to ap ills. ining some of the cou and critical abilities. I and presentational sk for attaining the cour the or no ability to ap	ttaining all the cours nal thought, and abili ive organizational an ast most of the cours o apply knowledge to of the course learnin ply knowledge to mo rse learning outcome Show limited ability ti ills.	
Course Grade	A+ to F A+ to F A B C D Fail Arthur W. A	Demonstrate learning outc to apply knoi presentationa Demonstrate learning outc familiar and s Demonstrate outcomes. Si familiar situal Demonstrate Show evidem apply knowle Demonstrate Lack of analy problems. Or	and a class test thorough master provided to a wide a show stron vledge to a wide a skills. substantial comm ome unfamiliar sit general but inco now evidence of s ions. Apply model partial but limited e of some coher dge to solve probl little or no evider tical and critical a ganization and pre	y at an advanced g analytical and cr range of complex nand of a broad ra lence of analytical ucations. Apply effective command of know command of know rent and logical th erns. Apply limited nce of command of abilities, logical an essentational skills a natics for Actua	level of extensive itical abilities and I , familiar and unfa and critical abiliti and critical abilities a anizational and pre vledge and skills re inking, but with lin or barely effective of knowledge and d coherent thinking are minimally effect aries (2006, 3rc	knowledge ar logical thinking amiliar situatior and skills requ- ies and logical al and presents ad logical thin esentational sk equired for atta nited analytical organizational skills required g. Show very li titve or ineffecti d edition).	nd skills required for a with evidence of orig is. Apply highly effect uired for attaining at le thinking, and ability ational skills. d for attaining most of king, and ability to ap ills. ining some of the cou and critical abilities. I and presentational sk for attaining the cour the or no ability to ap	ttaining all the cours nal thought, and abili ive organizational an ast most of the cours o apply knowledge to of the course learnin oly knowledge to mo rse learning outcome Show limited ability t ills. se learning outcome oly knowledge to solv	
Course Grade Grade Descriptors	assignmen         A+ to F         A         B         C         D         Fail         Arthur W. A         McGill, D.M         William H. J         Morneau S         Actuarial S         Actuarial S	bemonstrate learning outc to apply knoi presentationa Demonstrate learning outc familiar and s Demonstrate outcomes. Si familiar situat Demonstrate Show eviden apply knowle Demonstrate Demonstrate Show eviden apply knowle Demonstrate Cobecson: Pro M., Brown, K Aitken: Prob Sobecco: Hand Standard of P	thorough master ormes. Show stron videge to a wide a skills. substantial commons. Show evid ome unfamiliar sit general but ionwe vidence of s ions. Apply model partial but limited ce of some coher partial but limited ce of some coher	y at an advanced g analytical and cr range of complex nand of a broad ra lence of analytical ituations. Apply effec mplete command some analytical an rately effective org command of know rent and logical th ems. Apply limited nce of command of abilities, logical an esentational skills a natics for Actua ., Schieber, S pproach to Per dian Pension & Measuring Per , Selection of E	level of extensive itical abilities and I , familiar and unfa ange of knowledge and critical abilities active organization of knowledge and d critical abilities a anizational and pre- vledge and skills re- inking, but with lin or barely effective of knowledge and d coherent thinking are minimally effect aries (2006, 3rc J.: Fundamenta asion Funding a & Benefit Plans sion Obligation Economic Assu	knowledge ar logical thinking amiliar situatior and skills requi es and logical al and presenta d skills required for atta nited analytical e organizational skills required organizational skills required for atta nited analytical e organizational skills required for atta nited analytical e organizational skills required for atta nited analytical e organizational skills required for analytical construction for a the state state of the state of a the state of a the state and Valuation (2008, 14th ns mptions for	nd skills required for a , with evidence of orig is. Apply highly effect thinking, and ability ational skills. d for attaining most of king, and ability to ap ills. and critical abilities. I and presentational sk for attaining the cour tile or no ability to ap ve. e Pensions (2010, on, (2nd edition).	ttaining all the cours nal thought, and abili ive organizational an ast most of the cours o apply knowledge to of the course learnin oly knowledge to mo rse learning outcome Show limited ability t ills. se learning outcome oly knowledge to solv 9th Edition)	

	economics II (6 credits)					Academic Year	2012		
Offering Department	Statistics a	and Actuarial		Quota					
Course Co-ordinator	Dr E C K Cheung, Statistics and Actuarial Science								
Course Aim	stochastic	calculus, ar		This course and		covers Black-Scho T2806 will cover			
Course Contents	Sharpe rat option's ela bonds and	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.							
Learning Outcomes	- Understau - Understau - Understau - Understau	nd Brownian nd the Ito ca nd the Black nd the delta	on of the course, st motion and its prop culus and Ito formu Scholes model and hedging and some I ic interest rate mod	perties Ia I option pricing the basic risk manage	ory				
Pre-requisites	Pass in MA	ATH2603 or S	STAT2803 or STAT	2806 or STAT281	2 or STAT3316				
Offer in 2012 - 2013	2nd sem					Examination	May		
Offer in 2013 - 2014	Y								
Teaching Hours	The course	a consists of							
· · · · · · · · · · · · · · · · · · ·			36 lectures and 12	tutorials/example	classes.				
Assessment Method			amination (75% w	•		ssment (25% weig	hting) based or		
		ur written ex	amination (75% w	•		ssment (25% weig	hting) based or		
Assessment Method	assignmen	ur written ex nts and a class Demonstrate learning outc	amination (75% w s test thorough mastery at ar mes. Show strong analy ledge to a wide range	reighting) and a	coursework asse	ssment (25% weig nd skills required for att , with evidence of origin ns. Apply highly effectiv	aining all the course al thought, and ability		
Assessment Method Course Grade	assignmen A+ to F	Demonstrate learning outc to apply know presentationa Demonstrate learning outc	amination (75% w s test thorough mastery at ar mes. Show strong anal- yledge to a wide range I skills. substantial command of	eighting) and a advanced level of ex- ytical and critical abiliti of complex, familiar a f a broad range of kno of analytical and critic	coursework asse tensive knowledge a as and logical thinking nd unfamiliar situatio wledge and skills req al abilities and logica	nd skills required for att , with evidence of origin ns. Apply highly effectiv uired for attaining at lea t thinking, and ability to	aining all the course al thought, and ability e organizational and st most of the course		
Assessment Method Course Grade	A+ to F	Demonstrate learning outc to apply know presentationa Demonstrate learning outc familiar and s Demonstrate outcomes. Sl	amination (75% w s test thorough mastery at ar omes. Show strong analy ledge to a wide range I skills. substantial command of omes. Show evidence of ome unfamiliar situations general but incomplete	eighting) and a advanced level of ex- trical and critical abiliti of complex, familiar a f a broad range of kno of analytical and critic s. Apply effective orga command of knowle inalytical and critical a	tensive knowledge a es and logical thinking nd unfamiliar situatio wledge and skills req al abilities and logica nizational and present dge and skills require oilities and logical thir	nd skills required for att , with evidence of origin ns. Apply highly effectiv uired for attaining at lea I thinking, and ability to ational skills. ed for attaining most of king, and ability to appl	aining all the course al thought, and ability e organizational and st most of the course apply knowledge to the course learning		
Assessment Method Course Grade	A+ to F A B	Demonstrate learning outor to apply knoo presentationa Demonstrate learning outor familiar and s Demonstrate outcomes. SI familiar situat Demonstrate Show eviden	amination (75% w s test thorough mastery at ar omes. Show strong analy ledge to a wide range I skills. substantial command of omes. Show evidence of ome unfamiliar situation: general but incomplete iow evidence of some a ons. Apply moderately e partial but limited comm e of some coherent an	reighting) and a advanced level of ex- ytical and critical abiliti of complex, familiar a f a broad range of kno of analytical and critical adultical and critical a frective organizational and of knowledge and d logical thinking, but	tensive knowledge a as and logical thinking nd unfamiliar situatio wledge and skills req al abilities and logica nizational and present dge and skills required joilities and logical thir and presentational skills skills required for atta with limited analytics	nd skills required for att , with evidence of origin ns. Apply highly effectiv uired for attaining at lea I thinking, and ability to ational skills. ed for attaining most of king, and ability to appl	aining all the course al thought, and ability e organizational and st most of the course apply knowledge to the course learning y knowledge to most e learning outcomes how limited ability to		
Assessment Method Course Grade	A+ to F A B C	Demonstrate learning outco to apply know presentationa Demonstrate learning outco familiar and s Demonstrate outcomes. St familiar situat Demonstrate Show eviden apply knowle Demonstrate Show eviden Demonstrate Show eviden	amination (75% w s test thorough mastery at ar omes. Show strong analy ledge to a wide range I skills. substantial command of omes. Show evidence of somes. Show evidence of general but incomplete ow evidence of some a ons. Apply moderately of partial but limited comm e of some coherent an dge to solve problems. A little or no evidence of	reighting) and a a advanced level of ex- trical and critical abiliti of complex, familiar a f a broad range of kno of analytical and critic s. Apply effective orga- icommand of knowle and of knowledge and d logical thinking, but apply limited or baroly of command of knowledge , logical and coherent	coursework asse tensive knowledge a as and logical thinking nd unfamiliar situatio wledge and skills require al abilities and logical thin and presentational sh skills required for atta with limited analytica affective organizationa ge and skills required thinking. Show very I	nd skills required for att , with evidence of origin ns. Apply highly effectiv uired for attaining at lea- thinking, and ability to ational skills. ed for attaining most of king, and ability to appli cills. aining some of the cours I and critical abilities. S I and presentational skill for attaining the coursi title or no ability to appli	aining all the course al thought, and ability e organizational and st most of the course apply knowledge to the course learning y knowledge to most e learning outcomes how limited ability to s.		
Assessment Method Course Grade	A+ to F A B C D Fail	Demonstrate learning outo to apply know presentationa Demonstrate learning outo familiar and s Demonstrate outcomes. SI familiar situat Demonstrate Show eviden apply knowle Demonstrate Lack of analy problems. Or	amination (75% w s test thorough mastery at an mmes. Show strong anal- yledge to a wide range I skills. substantial command of ome unfamiliar situation: general but incomplete jow evidence of some a ons. Apply moderately e partial but limited comm ze of some coherent an dge to solve problems. A liitle or no evidence of tical and critical abilities	reighting) and a advanced level of ex- ytical and critical abiliti of complex, familiar a f a broad range of kno of analytical and critical adultical and critical a ecommand of knowle and of knowledge and do logical thinking, but ypply limited or barely of command of knowledge , logical and coherent tional skills are minima	tensive knowledge a as and logical thinking nd unfamiliar situatio wledge and skills required al abilities and logical nizational and present dge and skills required ities and logical thin and presentational sh skills required for atta with limited analytica affective organizationa ge and skills required thinking. Show very I Ily effective or ineffect	nd skills required for att , with evidence of origin ns. Apply highly effectiv uired for attaining at lea: I thinking, and ability to ational skills. ad for attaining most of nking, and ability to appl ills. and critical abilities. S I and critical abilities. S I and presentational skil for attaining the course ittle or no ability to appl ive.	aining all the course al thought, and abilit e organizational and st most of the course apply knowledge to the course learning y knowledge to mos e learning outcomes how limited ability to s.		
Assessment Method Course Grade Grade Descriptors	A+ to F A B C D Fail Robert L. N John Hull: Alison Ethe	Demonstrate learning outo to apply know presentationa Demonstrate learning outo familiar and s Demonstrate outcomes. SI familiar situat Demonstrate Show eviden apply knowle Demonstrate Lack of analy problems. Or McDonald: D Options, Fut	amination (75% w s test thorough mastery at ar mes. Show strong analy ledge to a wide range I skills. substantial command of ome unfamiliar situation: general but incomplete ow evidence of some a ons. Apply moderately e partial but limited comm ze of some coherent an dge to solve problems. A little or no evidence of tical and critical abilities janization and presental	reighting) and a advanced level of ev ytical and critical abiliti of complex, familiar a f a broad range of kno of analytical and critical adultical and critical a ffective organizational and of knowledge and do logical thinking, but upply limited or barely command of knowled bilogical and coherent tional skills are minima 2nd edition), Chap ivatives (2008, 7th loculus (2002)	tensive knowledge a as and logical thinking nd unfamiliar situatio wledge and skills required al abilities and logical nizational and present dge and skills required inters and logical thin and presentational sh skills required for atta with limited analytica effective organizational ge and skills required thinking. Show very I Ily effective or ineffect oters 20, 21 and 2 edition)	nd skills required for att , with evidence of origin ns. Apply highly effectiv uired for attaining at lea: I thinking, and ability to ational skills. ad for attaining most of hking, and ability to appl ills. and critical abilities. S I and critical abilities. S I and presentational skil for attaining the course ittle or no ability to appl ive. 4.	aining all the course al thought, and abilit e organizational and st most of the course apply knowledge to the course learning y knowledge to mos e learning outcomes how limited ability to s.		

STAT3822 Risk The	ory II (6 credits)	Academic Year	2012
Offering Department	Statistics and Actuarial Science	Quota	
Course Co-ordinator	Dr J K Woo, Statistics and Actuarial Science		
Course Aim	This course is an advanced course in risk theory which extends val discusses utility theory, ruin theory, aggregate claims process, and related		in STAT3810. It
Course Contents	Utility theory; discrete ruin model; compound Poisson risk model; ru coefficient; Lundbergs inequality; Tijms approximation; non-homogeneou Poisson process; inflation model; IBNR (Incurred But Not Reported) clai moments; equilibrium distributions.	s birth process; contag	gion model; mixed
Learning Outcomes	On successful completion of the course, students should be able to: - understand utility theory including some commonly used utility function utility maximization - define discrete and continuous ruin models - calculate the adjustment coefficient, Lundbergs inequality and Tijms app - understand the effect of reinsurance and change of parameters on ruin p - understand non-homogeneous birth process and its applications as com - understand mixed Poisson process and its applications including the infl - derive the relationship between stop-loss moments and equilibrium distr	roximation in ruin theor probability agion models for claim ation model and the IBI	y frequencies
Pre-requisites	Pass in STAT3810		
Offer in 2012 - 2013	1st sem	Examination	Dec
Offer in 2013 - 2014	Y		

Teaching Hours	The course consists of 36 lectures and 12 tutorials/example classes.					
Assessment Method	One 3-hour written examination (75% weighting) and a coursework assessment (25% weighting) based on assignments, tutorials, and a class test, etc.					
Course Grade	A+ to F					
Grade Descriptors	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.					
	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.					
	C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.					
	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.					
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.					
References	<ul> <li>Klugman S.A., Panjer H.H., &amp; Willmot G.E.: Loss Models: From Data to Decisions (John Wiley &amp; Sons, 200 edition).</li> <li>Kaas R., Goovaerts M., Dhaene J., &amp; Denuit M.: Modern Actuarial Risk Theory (Springer, 2004, 1st edition)</li> <li>Bowers N.L., Gerber H.U., Hickman J.C. &amp; Jones D.A.: Actuarial Mathematics (Society of Actuaries, 199 edition).</li> <li>Willmot G.E. &amp; Lin X.S.: Lundberg Approximations for Compound Distributions with Insurance Applic (Springer, 2000, 1st edition).</li> </ul>					
Course Website	webct.hku.hk					

STAT3988 Statistics	internship	o (6 crea	lits)		Academic Year	2012		
Offering Department	Statistics a	and Actua	rial Science	Quota				
Course Co-ordinator	Dr P L H Y	Dr P L H Yu, Statistics and Actuarial Science						
Course Aim	take on a r	minimum	of 160 hours of inter	ng in Statistics or Risk Manag nship work related to his ma ademic knowledge in a real-li	ajor disciplines. It provides	s students with first		
Course Contents	his/her int encountere	Upon completion of the internship, each student is required to submit a written report and to give a presentation of his/her internship experience. The report should emphasize important working/educational experiences encountered by the student during his/her internship. In many situations, this would mean a report of the project(s that the student has been involved in during his/her internship.						
Learning Outcomes	<ul> <li>gain first-l</li> <li>apply kno</li> <li>understand</li> </ul>	On successful completion of the course, students should be able to: - gain first-hand work experience in an industry related to statistics and risk management; - apply knowledge in statistics and risk management to solve practical problems in the work place; - understand contexts for specific quantitative skills developed in basic statistics and risk management courses; - communicate specialist knowledge in statistics and risk management to non-experts in a work environment.						
Pre-requisites	Students a	are expec	ed to have satisfacto	rily completed their Year 2 st	udy.			
Offer in 2012 - 2013	1st sem 2	2nd sem	Summer		Examination	No Exam		
Offer in 2013 - 2014	Y							
Teaching Hours	No formal I working da		but students are exp	ected to work for at least 16	0 hours (lunch hour exclu	ided) in at least 20		
Assessment Method	presentatio during the i	on on the internship	ir internship experie	ch student is required to sunce. Supervisors will assess of internships outside the unive ternal supervisor).	the students based on	their performance		
Course Grade	Pass/Fail							
Grade Descriptors	Pass	required colleague	in the job or assigned b es, and clients in the job.	weldge to solve problems in the w y supervisor(s). Establish effective Successfully fulfill the requirements valuation by supervisor(s), etc.	collaboration and communicati	on with supervisor(s),		
	Fail	Demonstrate very limited or no ability of applying knowledge to solve problems in the workplace. Fail to handle or carry out the						
Course Website	webct.hku.l	.hk						
Remarks	who have of Satisfactory internship Students w Visit http://v Enrolment	complete ry comple will be r who are in /www.hku of this co	d Year 1. tion of this course ca ecorded on the stud terested to enrol in th hk/science/current/b urse is not conducted	rily completed their Year 2 st an be counted towards the E lent's transcript. This course is course should contact the sc/internship/ for more inform d via the online course select pproval has been obtained fr	experiential Learning request will be assessed on P Department to obtain the ation. tion system and should be	irement. Details of ass or Fail basis. approval. a made through the		

		or statistical and risk analysts (0 credits)							
Offering Department	Statistics a	nd Actuarial Science	Quota	48					
Course Co-ordinator	Dr C W Kw	Dr C W Kwan, Statistics and Actuarial Science							
Course Aim	Science. It are essent	e is offered to students majoring in Statistics or Risk Manage t aims to enhance students' IT knowledge and skills which are ial for career development of statistical and risk analysts. The omputer hand-on workshops on VBA programming, MS-office	not covered in the cur course may contain a	rent curriculum bu variety of activitie					
Course Contents	analyses. T will be cons (Students a	Fraining in MS-Office includes VBA basic and macro, Access and SQL, with applications in statistical and risk analyses. Training in SPSS includes data management and statistical analysis. Training in other related software will be considered subject to the Departmental approval. Firm visits and career talks. Group project. Students are expected to have completed their Year 2 study. Special consideration will be given to those who have completed Year 1. Students who are interested to enroll in this course should contact the Department.)							
Learning Outcomes	- Understan - Understan - Understan	sful completion of the course, students should be able to: nd VBA in MD-Excel nd data management by MS-Access and SQL nd data management and statistical analysis by SPSS nd financial data management and analysis using appropriate s	software						
Pre-requisites	Students a	re expected to have satisfactorily completed their Year 2 study							
Offer in 2012 - 2013	Summer		Examination	No Exam					
Offer in 2013 - 2014	Y								
Teaching Hours		20 working hours of experiential learning activities consists of xercises of the computer software conducted in a computer lab							
Assessment Method		rse work involves attendance (10%), exercises and quizzes (6 ed on a Pass or Fail basis.	0%), group project (309	%). The course w					
Course Grade	Pass/Fail								
Grade Descriptors	Pass	Demonstrate ability of applying knowledge to solve problems in the workprequired in the job or assigned by supervisor(s). Establish effective coll colleagues, and clients in the job. Successfully fulfill the requirements se hours, written and oral report, and evaluation by supervisor(s), etc.	aboration and communication	on with supervisor(s),					
	Fail	Demonstrate very limited or no ability of applying knowledge to solve problems in the workplace. Fail to handle or carry out the							
Course Website	webct.hku.	hk							
Remarks	Actuarial S Experientia 2. Students Science co Enrolment	webct.hku.hk 1. This course is exclusively for 2nd and 3rd year BSc Risk Management & Statistics major students and BSc Actuarial Science students only. Priority would be given to those Year 3 students who have not satisfied a Experiential Learning (EL) requirements. 2. Students who take this course for satisfying the EL requirement must take an additional 6-credit advanced lev Science course in their primary Science major to complete the credit requirement. Enrolment of this course is not conducted via the online course selection system and should be made through t relevant Department/School office after approval has been obtained from the course coordinator.							

STAT6109 Research	n methods in statistics (6 credits)	Academic Year	2012			
Offering Department	Statistics and Actuarial Science	Quota				
Course Co-ordinator	Prof S M S Lee, Statistics and Actuarial Science					
Course Aim	This course introduces some statistical concepts and methods which potential graduate students will find usef preparing for work on a research degree in statistics. Focus is on applications of state-of-the-art statist techniques and their underlying theory.					
Course Contents	<ol> <li>The contents will be chosen from the following topics:</li> <li>Basic asymptotic methods: modes of convergence; stochast theorems; delta method; Edgeworth expansions; saddlepoint appr 2. Parametric and nonparametric likelihood methods: high-order a signed likelihood ratio statistics; empirical likelihood.</li> <li>Nonparametric statistical inference: sign and rank tests; Kolm density estimation; kernel methods.</li> <li>Robust methods: measures of robustness; M-estimator; L-estim 5. Computationally-intensive methods: cross-validation; bootstrap; 6. Sequential analysis: sequential probability ratio test; sequential 7. Model selection using information criteria.</li> <li>Other topics as determined by the instructor.</li> </ol>	oximations. pproximations; profile likeliho ogorov-Smirnov test; nonpara ator; R-estimator; estimating f permutation methods.	od and its variants ametric regression			
Learning Outcomes	On successful completion of the course, students should be able t - comprehend the language and technicalities found in statistical r - understand the use of standard mathematical tools for conductin - apply a variety of research tools to solve standard statistical prot acquire exposure to some developments in contemporary statistic	esearch literature; g statistical research; lems;				
Pre-requisites	Pass in STAT2301 or STAT2804. This course is mutually exclusive	ve to STAT3306.				
Offer in 2012 - 2013	Not offered	Examination	Dec			
Offer in 2013 - 2014	Y					
Teaching Hours	36 hours of lectures and 12 hours of tutorials					

Assessment Method	One 2-hour written examination (75% weighting) and a coursework assessment (25% weighting) based on assignments and a class test					
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.					
Textbooks	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	webct.hku.hk					

STAT6110 Advance	d probabili	lity (6 crea	dits)			Academic Year	2012	
Offering Department	Statistics a	and Actuari	al Science			Quota		
Course Co-ordinator	Prof Y Larr	m, Statistics	s and Actuarial Scie	nce				
Course Aim	will focus o	on some ba	asic concepts in the	neasure theory and probabil pretical probability which are arial science, probability and	e essentia	l for		
Course Contents	space, me lemma, do convergen	Contents include: sigma-algebra, measurable space, measure and probability, measure space and probability space, measurable functions, random variables, integration theory, monotone convergence theorem, Fatou's emma, dominated convergence theorem, characteristic functions, convergence of random variables, weak convergence, probabilistic inequalities, L to the power 2 - and Hilbert spaces, conditional expectation, martingales and applications.						
Learning Outcomes	- Understan - Learn the theorem, F - Understan	and the func le general co Fatou's lem and the con	damental measure t oncept of integratior			ence		
Pre-requisites	Pass in ST	TAT2303 or	r STAT2803. This c	ourse is mutually exclusive	to STAT3	316.		
Offer in 2012 - 2013	Not offered	ed				Examination	Мау	
Offer in 2013 - 2014	Y							
Teaching Hours	36 hours of	of lectures a	and 12 hours of tuto	rials				
Assessment Method			examination (50% s, and a class test, e	weighting) and a coursew	ork asse	ssment (50% weig	hting) based or	
Course Grade	A+ to F							
Grade Descriptors	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.							
	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.							
	C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.							
	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.							
	Fail       Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.							
References	New York, Chow Y. H	Jean Jacod and Philip Protter: Probability Essentials (Universitext, Springer-Verlag, New York, 2004, 2nd edition) Chow Y. H. and Teicher H.: Probability Theory (Springer-Verlag, New York, 1997, 3rd edition) Chung K. L.: A Course in Probability Theory (Academic Press, 2001, 3rd edition)						
Course Website	webct.hku.	ı hk	•	, ,				

STAT6111 Computa	tional stati	STICS (O CREATS)	Academic Year	2012				
Offering Department	Statistics a	and Actuarial Science	Quota					
Course Co-ordinator	Dr G Tian,	Statistics and Actuarial Science						
Course Aim	computatio	nis course aims to give undergraduate and postgraduate students in statistics a background in modern omputationally-intensive methods in statistics. It emphasizes the role of computation as a fundamental tool of scovery in data analysis, of statistical inference, and for development of statistical theory and methods.						
Course Contents	Carlo integ	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.						
Learning Outcomes	<ul> <li>understal integration</li> <li>realize th and apply</li> <li>understal range of aj</li> <li>apply EM Carlo meth</li> <li>apply Boo</li> </ul>	On successful completion of the course, students should be able to: understand the importance of the technique for generating random variables in Bayesian statistics, Monte Carlo ntegration and bootstrapping methods; realize the advantages and disadvantages of the Newton-Raphson algorithm and the Fisher scoring algorithm and apply them to fit generalized linear models; understand the essence and basic principle of the EM-type algorithms and MM-type algorithms, realize their ange of application, and apply them to solve practical problems; apply EM-type algorithms to find the posterior mode and apply Markov chain Monte Carlo methods to generate posterior samples; apply Bootstrap methods to obtain estimated standard errors of estimators and confidence intervals of parameters for both parametric and non-parametric cases.						
Pre-requisites	Pass in ST	AT2301 or STAT2804. This course is mutually exclusive to STA	T3317.					
Offer in 2012 - 2013	Not offered	t	Examination	May				
Offer in 2013 - 2014	Y							
Teaching Hours	36 hours o	f lectures and 12 hours of tutorials						
Assessment Method		ur written examination (50% weighting) and a coursework as nts, practical work, and a term test	ssessment (50% wei	ghting) based on				
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.							
			Tan, M., Tian, G.L. and Ng, K.W: Bayesian Missing Data Problems: EM, Data Augmentation and Non-iterative Computation (Chapman & Hall/CRC, Boca Raton, 2010).					
Textbooks	Augmenta							
Textbooks References	Augmentat 2010). Givens, G.		Raton,					

STAT6114 Advanced	statistical modelling (6 credits)	Academic Year	2012		
Offering Department	ment Statistics and Actuarial Science Quota				
Course Co-ordinator Dr J F Yao, Statistics and Actuarial Science					
Course Aim	This course introduces modern methods for constructing and evaluating implementation using popular computing software, such as SAS or R.	ting statistical mo	dels and their		
Course Contents	It will cover both the underlying principles of each modelling approach and the estimation procedures. Topics from: (i) Review of multiple linear regression a cross validation; the bootstrap; diagnostics; stochastic regressors; shrinkage mixed models; (iii) Nonparametric and semi-parametric methods: kernel densit selection of smoothing parameters; (iv) Additive models; semi-parametric models; and (v) Basic state space modelling for time series data.	nd its extensions: v e methods; (ii) Ran y estimation; local k	ariable selection dom effects and ernel regression		
Learning Outcomes	On successful completion of the course, students shold be able to: - Undersatnding the definition and basic characteristics of each statistical mod - Identifying for a given set of data the most suitable stistical model and tools to - In perticular, skills of building a scoring model for various management and p	o use;			

Pre-requisites	Pass in S	STAT2301					
Offer in 2012 - 2013	2nd sem	2nd sem Examination May				May	
Offer in 2013 - 2014	Y	Y					
Teaching Hours	24 hours	4 hours of lectures and 12 hours of tutorials					
Assessment Method		ne 2-hour examination (50% weighting) and a coursework assessment (50% weighting) based on assignments nd class test(s)					
Course Grade	A+ to F						
Grade Descriptors	A	learning outcome	rough mastery at an advanced level c s. Show strong analytical and critical al ge to a wide range of complex, famili ills.	bilities and logical thinking	, with evidence of origin	nal thought, and ability	
	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	Lack of analytica	e or no evidence of command of know I and critical abilities, logical and cohe zation and presentational skills are min	rent thinking. Show very li	ttle or no ability to app		
Textbooks			ed Linear Models (2nd ed.), Wil nparametric and Semi-paramet				
References	M. Panik	, 2009: Regressio	n Modeling, CRC Press				
Course Website	webct.hk	ku.hk					

	a quantitati	e risk management and f	finance (6 credits)	Academic Year	2012			
Offering Department	Statistics a	d Actuarial Science		Quota				
Course Co-ordinator	Prof W K L	Statistics and Actuarial Science	ce					
Course Aim	finance the	covers statistical methods any to market practice via statis address the discrepancy betwee	stical modeling and decision	making. Emphases will I				
Course Contents	options an	asic Monte Carlo and Quasi-Monte Carlo Methods; Variance Reduction Techniques; Simulating the value of ptions and the value-at-risk for risk management; Review of univariate volatility models; multivariate volatility nodels; Extreme value theory for risk management.						
Learning Outcomes	<ul> <li>apply More</li> <li>predict volume</li> </ul>	Il completion of the course, st e Carlo methods to determine tility of a set of securities using e value-at-risk under extreme	the value of options and othe g appropriate models;	er derivative securities;				
Pre-requisites	Pass in ST	Т3322						
Offer in 2012 - 2013	2nd sem			Examination	May			
Offer in 2013 - 2014	Y							
Teaching Hours	The course	consists of 36 lectures and 12	The course consists of 36 lectures and 12 tutorials/example classes.					
		One 2-hour written examination (75% weighting) and a coursework assessment (25% weighting) based on assignments, tutorials and a class test						
Assessment Method			reighting) and a coursework	assessment (25% we	ighting) based o			
			reighting) and a coursework	assessment (25% we	ighting) based o			
Course Grade	assignmen		n advanced level of extensive know ytical and critical abilities and logical	ledge and skills required for a thinking, with evidence of orig	attaining all the cours inal thought, and abilit			
Course Grade	assignmen A+ to F	, tutorials and a class test Demonstrate thorough mastery at an earning outcomes. Show strong analy io apply knowledge to a wide range	n advanced level of extensive know ytical and critical abilities and logical of complex, familiar and unfamiliar f a broad range of knowledge and s of analytical and critical abilities an	ledge and skills required for a thinking, with evidence of orig situations. Apply highly effec kills required for attaining at le d logical thinking, and ability	attaining all the cours inal thought, and abilit ive organizational an			
Course Grade	A+ to F	, tutorials and a class test Demonstrate thorough mastery at an earning outcomes. Show strong analy to apply knowledge to a wide range presentational skills. Demonstrate substantial command of earning outcomes. Show evidence of	n advanced level of extensive know ytical and critical abilities and logical of complex, familiar and unfamiliar f a broad range of knowledge and si of analytical and critical abilities an s. Apply effective organizational and a command of knowledge and skills analytical and critical abilities and log	ledge and skills required for a thinking, with evidence of orig situations. Apply highly effec kills required for attaining at le d logical thinking, and ability presentational skills. a required for attaining most gical thinking, and ability to ap	attaining all the cours inal thought, and abilit tive organizational an east most of the cours to apply knowledge to of the course learning			
Assessment Method Course Grade Grade Descriptors	A+ to F A B	, tutorials and a class test Demonstrate thorough mastery at an earning outcomes. Show strong analy to apply knowledge to a wide range presentational skills. Demonstrate substantial command of earning outcomes. Show evidence of familiar and some unfamiliar situations Demonstrate general but incomplete outcomes. Show evidence of some a	n advanced level of extensive know ytical and critical abilities and logical of complex, familiar and unfamiliar f a broad range of knowledge and s of analytical and critical abilities an s. Apply effective organizational and e command of knowledge and skills analytical and critical abilities and log effective organizational and presenta nand of knowledge and skills required d logical thinking, but with limited a	ledge and skills required for a thinking, with evidence of orig situations. Apply highly effec kills required for attaining at le d logical thinking, and ability presentational skills. a required for attaining most gical thinking, and ability to ap tional skills. d for attaining some of the cou analytical and critical abilities.	attaining all the cours inal thought, and abilit tive organizational an east most of the cours to apply knowledge to of the course learning ply knowledge to most rse learning outcomest Show limited ability t			
Course Grade	A+ to F A B C	, tutorials and a class test Demonstrate thorough mastery at an earning outcomes. Show strong analy to apply knowledge to a wide range presentational skills. Demonstrate substantial command of earning outcomes. Show evidence of amiliar and some unfamiliar situations Demonstrate general but incomplete putcomes. Show evidence of some a familiar situations. Apply moderately e Demonstrate partial but limited comm Show evidence of some coherent an	n advanced level of extensive know ytical and critical abilities and logical of complex, familiar and unfamiliar f a broad range of knowledge and si of analytical and critical abilities an s. Apply effective organizational and e command of knowledge and skills analytical and critical abilities and log effective organizational and presenta hand of knowledge and skills required a logical thinking, but with limited a Apply limited or barely effective organ command of knowledge and skills, logical and coherent thinking. Sho	ledge and skills required for a thinking, with evidence of orig situations. Apply highly effec kills required for attaining at le d logical thinking, and ability presentational skills. a required for attaining most gical thinking, and ability to ap tional skills. d for attaining some of the cou analytical and critical abilities. sizational and presentational si required for attaining the coul w very little or no ability to ap	attaining all the cours inal thought, and abilit ive organizational an east most of the cours to apply knowledge t of the course learnin ply knowledge to most rse learning outcomes Show limited ability t kills.			
Course Grade	assignmen         A+ to F         A         B         C         D         Fail         McLeish, D         Glasserman         Danielsson         McNeil, A.	, tutorials and a class test Demonstrate thorough mastery at an earning outcomes. Show strong analy to apply knowledge to a wide range presentational skills. Demonstrate substantial command of earning outcomes. Show evidence of familiar and some unfamiliar situations Demonstrate general but incomplete outcomes. Show evidence of some a familiar situations. Apply moderately e Demonstrate partial but limited comm Show evidence of some coherent an apply knowledge to solve problems. A Demonstrate little or no evidence of Lack of analytical and critical abilities	n advanced level of extensive know ytical and critical abilities and logical of complex, familiar and unfamiliar f a broad range of knowledge and s of analytical and critical abilities an s. Apply effective organizational and e command of knowledge and skills mandytical and critical abilities and log effective organizational and presenta and of knowledge and skills required d logical thinking, but with limited a Apply limited or barely effective organ command of knowledge and skills , logical and coherent thinking. Sho tional skills are minimally effective or & Finance. (Wiley, 2005). n Financial Engineering. (Spri g (Willy 2011) uantitative Risk Management	ledge and skills required for a thinking, with evidence of orig situations. Apply highly effect kills required for attaining at led d logical thinking, and ability presentational skills. a required for attaining most tical thinking, and ability to ap tional skills. d for attaining some of the cou analytical and critical abilities. nizational and presentational sl required for attaining the cour w very little or no ability to ap ineffective.	attaining all the cours inal thought, and abili inve organizational an east most of the cours to apply knowledge to of the course learnin ply knowledge to mo rse learning outcome Show limited ability t kills.			

## Course Code: CCCH9020

Course Title: Science and Technology: Lessons from China

#### **Course Description**:

In spite of the vast and superior knowledge possessed by the ancient Chinese relative to the rest of the world, China did not develop into a dominant technoculture. This course will explore some of the lesser known inventions and scientific development in ancient China and factors that caused China to fall behind the West in technological development. The contents of the course include perception of the material world in ancient China, early Chinese views of the universe, earth and Nature, changes in the perception of these entities over time, scientific inventions and theories of ancient China, and the linkage between science, art and literature in China. Guest speakers will give insights on specific areas of technological advancement in ancient China.

#### Offer Semester: Second semester

Day of Teaching: Wednesday

Assessment: 70% coursework; 30% examination

## **Course Co-ordinator**:

Professor L S Chan Department of Earth Sciences, Faculty of Science Tel: 2859 8002 Email: chanls@hku.hk

## Teacher(s):

Professor L S Chan Department of Earth Sciences, Faculty of Science Tel: 2859 8002 Email: chanls@hku.hk

## Study Load

Activities	Number of hours
Lectures	16
Tutorials	4
Seminars	4
Fieldwork / Visits	6
Reading / Self-study	80
Assessment: Essay / Report writing	40
Assessment: Examination	2
Total:	152

#### **Course Learning Outcomes**

 On completing the course, students will be able to:

 1.
 Give an account of the extent of scientific achievements in ancient China and explain the social-environmental background governing the development of science and technology in ancient China.

 2.
 Deliver an in-depth account on why western style science did not flourish in China.

3. Give a critical comparison of the approach and inquiry methods used by scholars in ancient China and in modern scientific studies.

#### Assessment

Assessment Tasks	Weighting
Essays	40
Examination	30
Field trip / Discussion / Hands-on work	10
Book analysis	20

## **Required Reading**

Institute of the History of Natural Sciences, Chinese Academy of Sciences. (1983). Ancient China's technology and science. Beijing: Foreign Languages Press.

## Course Code: CCGL9016

#### Course Title: Feeding the World

#### **Course Description**:

Continuing human population increases, competition for water supplies, and concern about energy prices have led to profound pessimism about long-term food supplies. Already a billion people go hungry every day. This course offers an in-depth look at key issues in global food sufficiency, food production, food distribution, prospects and constraints. You will develop an integrated technical, economic and political understanding of the global food supply crisis. You will be equipped to understand and appreciate media reports related to this issue in your lives as informed and influential citizens. Topics covered will include: global food production and population trends; the special problem of China the world's biggest producer and consumer of food; the Green Revolution; alternative agricultures; meat production; agriculture as an energy-intensive business; water and agriculture; and biofuels.

[Non-permissible combination: CCGL9017 "Food: Technology, Trade and Culture"]

Offer Semester: First semester

Day of Teaching: Saturday

Assessment: 100% coursework

## **Course Co-ordinator:**

Dr H Corke School of Biological Sciences, Faculty of Science Tel: 2299 0313 Email: harold@hku.hk

#### Teacher(s):

Dr H Corke School of Biological Sciences, Faculty of Science Tel: 2299 0313 Email: harold@hku.hk

#### Professor D L Phillips

Department of Chemistry, Faculty of Science Tel: 2859 2160 Email: phillips@hku.hk

## Study Load

Activities	Number of hours
Lectures	24
Tutorials	12
Seminars	6.5
Reading / Self-study	40
Assessment: Essay / Report writing	12
Assessment: Presentation (incl preparation)	60
Assessment: In-class test	1.5
Total	156

#### **Course Learning Outcomes**

On	completing the course, students will be able to:		
1.	. Describe and explain the Green Revolution and its relationship to future improvements in		
	agriculture through biotechnology.		
2.	Demonstrate an understanding of the critical issues facing China's struggle to feed itself.		
3.	Discuss critically the fundamental relationships among energy supply, energy cost, and food		
	production.		
4.	Use newly developed skills to critically read, analyze and interpret media reports on food		

	supply related topic.
5.	Demonstrate investigative skills by preparing an in-depth group investigation (resulting in a 30
	minute presentation) using library databases and FAOStat production data.

Assessment			
Assessment Tasks	Weighting		
Quizzes / Participation	10		
Proposal / Outline for essay	5		
In-class test	50		
Group project and presentation	35		

## **Required Reading**

Several newspaper, popular science, business school case studies, website references, and other teaching resources will be prepared using up-to-date sources for each class session. Extensive use will be made of FAOSTAT, an agricultural production database from the United Nations.

## Course Code: CCGL9017

Course Title: Food: Technology, Trade and Culture

## **Course Description**:

Why do we eat what we eat? Where does the food come from? What makes for "desirability" or sensory quality in food? How and why did global trade develop around the production and shipping of food? What are the historical roots of the modern-day globalized food industry? This course will offer an in-depth look at key issues in the economic history of global trade in food, in processing foods for optimum quality, and the development of markets for new products. Examples will be drawn from commodities – such as salt, sugar or spices; major beverages – such as wine or coffee; and newly globalized products – such as pizza or chocolate. The major themes of the course are:

The historical development of food commodity trading

The globalization of food preferences

The definition, development and spread of "new" products

The understanding of some basic underlying technology/science in the production and processing of major foods.

[Non-permissible combination: CCGL9016 "Feeding the World"]

## Offer Semester: Second semester

Day of Teaching: Saturday

Assessment: 60% coursework; 40% examination

## **Course Co-ordinator**:

Dr H Corke School of Biological Sciences, Faculty of Science Tel: 2299 0313 Email: harold@hku.hk

#### Teacher(s):

Dr H Corke School of Biological Sciences, Faculty of Science Tel: 2299 0313 Email: harold@hku.hk

# Professor D L Phillips

Department of Chemistry, Faculty of Science Tel: 2859 2160 Email: phillips@hku.hk

Study Load

Activities

Number of hours

Lectures	24
Tutorials	12
Seminars	6
Reading / Self-study	30
Research and development of project	20
Assessment: Essay / Report writing	10
Assessment: Presentation (incl preparation)	48
Assessment: Examination	2
Total:	152

## **Course Learning Outcomes**

On completing the course, students will be able to:

- 1. Describe and explain the origin, production, and processing of a range of key food materials and food products.
- 2. Outline the history of global trade in selected food commodities and products, showing an understanding of how this impacted economic development and cultural change.
- 3. Apply formal methodologies from sensory science to evaluating the organoleptic properties of food products.
- 4. Appreciate the massive changes in the dietary culture of a "global city" such as Hong Kong over the past 30 years.
- 5. Demonstrate the ability to investigate a topic within the subject matter of the course, and apply new methodologies and paradigms to summarize and present the results.

#### Assessment

Assessment Tasks	Weighting
Tutorial active participation	10
Short critical reports	10
Project development	10
Project outcome and presentation	30
Examination	40

## **Required Reading**

Pomeranz, K., & Topik, S. (2006). *The world that trade created: Society, culture, and the world economy, 1400 to the present* (2nd ed.). Armonk, NY: M. E. Sharpe.

## Course Code: CCGL9033

Course Title: Weapons of Mass Destruction: Science, Proliferation and Terrorism

## **Course Description**:

Weapons of mass destruction (WMD), i.e. nuclear, chemical and biological, comprise the most destructive and lethal weapons ever developed by humankind. Given that these weapons pose a severe threat to the survivability of humanity, increasing our understanding of their development, deterrent potential, reduction and more recently, the threat posed by proliferation networks as well as terrorist groups is of utmost importance. This course will start with the historical development of WMD and will be followed by a discussion of the underlying physical principles involved in WMD technology as well as biological and medical effects of nuclear weapons and other weapons of mass destructions. We will then draw the students' attention to the political and philosophical aspects of weapons of mass destruction, the current spread of WMD technology and non-proliferation treaties that aim to regulate and reduce WMD proliferation. We will also take a close look at the evolution of WMD proliferation networks, the emergence of nuclear terrorism and the consequences of terror-networks acquiring WMD materials. Finally, we will end this course with an important question: can the world move towards the complete disarmament of all WMD and would such a goal be desirable?

Offer Semester: First semester

Day of Teaching: Wednesday

## Assessment: 100% coursework

#### **Course Co-ordinator**:

Dr K H Lemke Department of Earth Sciences, Faculty of Science Tel: 2241 5474 Email: kono@hku.hk

## Teacher(s):

Dr K H Lemke Department of Earth Sciences, Faculty of Science Tel: 2241 5474 Email: kono@hku.hk

## Dr Y Chiu

Department of Politics and Public Administration, Faculty of Social Sciences Tel: 3917 1926 Email: yvchiu@hku.hk

#### Study Load

Activities		Number of hours
Lectures		24
Tutorials		12
Reading / Self-study		40
Assessment: Essay / Report writing		15
Assessment: Presentation (incl preparation)		15
Assessment: In-class test (incl preparation)		15
	Total:	121

## **Course Learning Outcomes**

	8			
On	On completing the course, students will be able to:			
1.	Describe and explain the technological development of nuclear, chemical and biological WMD			
	and their application in conflicts.			
2.	Identify and evaluate the relationship between WMD producers and proliferators and how			
	globalization has impacted these relationships.			
3.	Evaluate key components of recent nuclear test ban treatises and describe what type of			
	technology is used for compliance monitoring.			
4.	Discuss how proliferation networks of nuclear, chemical and biological WMD differ and how			
	non-state actors seek to acquire WMD.			
5.	Identify and analyze potential worst-case WMD attack scenarios and develop appropriate			
	response strategies.			
A	Accomment			

Assessment

Assessment Tasks	Weighting
Essay	25
Group multimedia presentation	25
Group debate	20
In-class test	30

## **Required Reading**

Reading materials, i.e. articles, review papers, white paper-type reports will be provided on a weekly basis. Current issue related course reading materials may change and will be provided accordingly.

Course Code: CCST9011

Course Title: Biotechnology - Science and Impacts

## **Course Description**:

This course provides students with the facts about the scientific discovery leading to the development of this new and revolutionary technology, and challenges them to think, investigate and evaluate how this technology can help solve medical and health, agricultural and food, and environmental and sustainable resources problems and also its potential risk and hazards. Students will gain general understanding and knowledge of basic genetic, molecular biology and biotechnology, and interest in and awareness of the modern advancement of molecular biology and biotechnology. Students will be challenged to gain understanding about the impacts of biotechnology in human medical health, agriculture and environment. The moral-ethical issues associated with the biotechnology industry will be discussed and debated leading to the appreciation of the potential significant interconnection between biotechnology knowledge and humanities.

[Non-permissible combination: CCST9006 "Biomedical Breakthroughs in a Pluralistic World"]

## Offer Semester: First semester

**Day of Teaching**: Wednesday

Assessment: 100% coursework

#### **Course Co-ordinator**:

Professor F C C Leung School of Biological Sciences, Faculty of Science Tel: 2299 0825 Email: fcleung@hkucc.hku.hk

#### Teacher(s):

Professor F C C Leung School of Biological Sciences, Faculty of Science Tel: 2299 0825 Email: fcleung@hkucc.hku.hk

#### Study Load

Activities		Number of hours
Lectures		24
Tutorials		12
Discussion (reading and self-study)		48
Assessment: Essay / Report writing		15
Assessment: Presentation (incl preparation)		30
	Total:	129

#### **Course Learning Outcomes**

Cou	The Learning Outcomes			
On	On completing the course, students will be able to:			
1.	Describe and explain the principles of inheritance, recombinant DNA and cloning.			
2.	Determine, explain and appraise the benefits and shortcomings of the application of			
	biotechnology knowledge.			
3.	Select and justify the use of advanced biotechnology products through bioethical			
	consideration.			
4.	Demonstrate professional and ethical approaches in presenting findings and analyses in a			
	coherent and effective manner.			

## Assessment

Assessment Tasks	Weighting
In-class participation and quizzes	15
Essays and written reports	20
Discussion forum	35
Poster and oral presentation	30

#### **Required Reading**

Selected reading materials (2-3 assigned articles per week) from *Scientific American*, the science and technology section of *The New York Times* and *The Washington Post*, and the Internet.

**Course Title**: Our Place in the Universe

## **Course Description**:

This course discusses the historical changes in the perception of our place in the universe as a result of astronomical development. We begin with ancient models of the universe in different cultures and the religious and philosophical interpretation of celestial objects, through the Copernican revolution and the work of Kepler, Galileo and Newton, towards our current physical model of the universe.

## Topics include:

Changing perceptions of our place in the universe as the result of astronomical development. Illustration of the development of the scientific method and how science has influenced the evolution of our philosophical thinking and cultural development;

Ancient models of the universe and the early philosophical and religious interpretation of celestial objects;

The development of concepts of time and calendars through the observation of solar, lunar, and planetary motions;

The Copernican revolution and the change from geocentric to heliocentric cosmology;

The application of scientific method and a physical interpretation of the universe through the work of Kepler, Galileo and Newton;

The expansion of the spatial scale of the universe as the result of modern astronomical observations;

Expansion of the time domain in cosmic history through the study of the history of the Earth, biological evolution, and cosmic evolution.

## Offer Semester: Second semester

Day of Teaching: Wednesday

Assessment: 60% coursework; 40% examination

## **Course Co-ordinator**:

Professor S Kwok Faculty of Science Tel: 2859 2682 Email: deansci@hku.hk

#### Teacher(s):

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#### Dr J C S Pun

Department of Physics, Faculty of Science Tel: 2859 1962 Email: jcspun@hkucc.hku.hk

## Study Load

Activities		Number of hours
Lectures		22
Tutorials		8
Fieldwork / Visits		2
Reading / Self-study		100
Laboratory		4
Assessment: Essay / Report writing		10
Assessment: Examination		4
	Total:	150

## **Course Learning Outcomes**

On completing the course, students will be able to:

1.	Describe the scientific method and explain how the scientific method was developed and	
	applied to explain and predict motions of celestial objects.	
2	Evaluate the role of acience in transforming our philosophical thinking	

2. Evaluate the role of science in transforming our philosophical thinking.

3.	Identify qualitative and quantitative everyday astronomical phenomena and describe how such understanding has evolved over history.
4.	Describe the emergence of rational thinking and assess the effects of social environment on intellectual development through historical examples.

## Assessment

Assessment Tasks	Weighting
Assignments	20
Laboratory reports	20
Mid-term test	20
Examination	40

## **Required Reading**

Koestler, A. (1968). *The sleepwalkers: A history of man's changing vision of the universe*. New York: Penguin Books.

## Course Code: CCST9013

Course Title: Our Living Environment

## **Course Description**:

This course will introduce to students the diverse ways in which human society has interacted with the natural environment, raise their awareness of the complexity of environmental issues, and encourage them to explore various aspects of global and local environmental problems. The teaching will focus firstly on how scientific and technological development has influenced human society in gaining economic benefits from understanding and being able to modify and manage the natural environment. It will then draw students' attention to the consequences of human's modification of the natural environment, including an increase in the scale of natural hazards recently occurring across the world. Students will be guided to examine global (resources, climate change, economic growth, etc.) and local (pollution and resource depletion in China and Hong Kong) environmental issues, and explore possible scientific and technological solutions along with political, social and economical considerations to these environmental problems.

[Non-permissible combination: CCST9016 "Energy: Its Evolution and Environmental Impacts"]

Offer Semester: Second semester

Day of Teaching: Wednesday

Assessment: 100% coursework

**Course Co-ordinator:** 

Dr S C Chang Department of Earth Sciences, Faculty of Science Tel: 2857 8577 Email: suchin@hku.hk

Teacher(s):Dr S C ChangDepartment of Earth Sciences, Faculty of ScienceTel: 2857 8577Email: suchin@hku.hk

Dr J A King Department of Earth Sciences, Faculty of Science Tel: 2241 5473 Email: jessking@hkucc.hku.hk

#### Study Load Activities Number of hours Lectures 20 Tutorials 8 Fieldwork / Visits 4 4 Palaeoclimate laboratory Reading / Self-study 84 Workshops on essay writing 2 Assessment: Essay / Report writing 16 Assessment: Presentation (incl preparation) 8 Assessment: Quizzes 2 Total: 148

## **Course Learning Outcomes**

On completing the course, students will be able to:

1.	Recognize and describe the reciprocal relationships between humans and their environment	
	influenced by scientific discovery and technological development.	
2	Analyze the importent of existing discourses and technological development on the network	

- 2. Analyze the impacts of scientific discovery and technological development on the natural environment and human societies at different spatial and temporal scales.
- 3. Demonstrate an awareness of the impacts of science within the broader economic, environmental and socio-cultural context, and apply knowledge gained to evaluate solutions appropriate to the specific cultures and environments.
- 4. Produce written evidence, in the form of individual course work, of their aquisition of knowledge and analytical skills in the topic.
- 5. Present, in the form of internet searching for relevant information and group digital presentation of research results, their IT and communication skills.

## Assessment

Assessment Tasks	Weighting
Literature reviews	20
Paleoclimate laboratory (report and quiz)	30
Lamma fieldtrip	10
Concept mapping with explanations	20
Multiple choice quiz	20

## **Required Reading**

Sections from:

Jones, G. E. (2004). *People and environment: A global approach*. New York: Pearson Prentice Hall. Simmons, I. G. (1989). *Changing the face of the earth: Culture, environment, history*. Oxford: Blackwell.

## Course Code: CCST9014

Course Title: Science and Music

## **Course Description**:

The course aims at an appreciation of the close connection between music and science that has existed historically from Pythagoras on into modern times. The essential physics of musical sound production and analysis will be provided in order to facilitate the elementary principles behind wind, string and percussion instruments and their characteristic timbre. The development of scales from fundamental principles will be dealt with leading to an appreciation of some of the subtle differences between Chinese and Western music. Contemporary music and science interactions will focus on electronic music and the working principles of modern instruments such as the electric guitar. Finally some scientific understanding of musical appreciation will be given by looking at the factors that make music pleasing.

## Offer Semester: First Semester

## Day of Teaching: Wednesday

Assessment: 100% coursework

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Teacher(s):Dr H F ChauDepartment of Physics, Faculty of ScienceTel: 2859 1925Email: hfchau@hku.hk

Dr H Y Chan School of Humanities (Music), Faculty of Arts Tel: 3917 5210 Email: tlychan@hkucc.hku.hk

## **Study Load**

Activities		Number of hours
Lectures		24
Tutorials		8
Reading / Self-study		50
Assessment: Essay / Report writing		20
Assessment: Presentation (incl preparation)		15
Assessment: In-class tests (incl preparation)		20
	Total:	137

## **Course Learning Outcomes**

On completing the course, students will be able to:

On	r completing the course, students will be able to.		
1.	Demonstrate appreciation of the close ties there have been between the study of music an		
	science over the centuries, and how in the modern era close ties still exist but for various		
	reasons are largely ignored.		
2.	2. Explain the production of musical tone and timbre in musical instruments using the scientific		
	principles and understanding of sound propagation, waves and harmonics.		
3.	Apply simple mathematics to the construction of different musical scales (just, equal,		
	meantone) and appreciate the historical development of scales in both Europe and China.		
4.	Realize and discuss coherently philosophical issues at the science and music interface.		
5.	Demonstrate academic research capabilities by carrying out a research project on some topics		
	relating science and music.		

## Assessment

Assessment Tasks	Weighting
In-class tests	40
Project component 1 (content)	30
Project component 2 (portfolio)	10
Project component 3 (presentation)	20

#### **Required Reading**

Hall, D. E. (2002). *Musical acoustics* (3rd ed.). Pacific Grove, CA: Brooks/Cole Publishing Co. [Chaps. 2, 11, 12, 18]

## Course Code: CCST9017

Course Title: Hidden Order in Daily Life: A Mathematical Perspective

**Course Description**:

Although not obvious, mathematics actually permeates many areas of our modern society, affecting us fundamentally on an everyday basis. For example, the Human Genome Project, GPS systems, and mobile phones use mathematics extensively as well as other non-science matters such as financial investment, data encryption, and internet searching. Even voting systems, an important feature of our democracy, can be analyzed with the help of mathematics, enabling us to gain a deeper understanding of what is meant by fairness of a voting system or a social choice procedure and its limitations. Through exploring non-technically some mathematically rich daily life topics, this course aims to help students gain essential mathematical literacy for living in the 21st century. Students will learn the mathematical concepts and principles of things that they encounter in modern society, and learn how to handle and interpret numerical and other forms of mathematical data that affect their daily life.

Note: Mathematics beyond the level of general school mathematics is not required. The focus of the course is on demonstrating analytical reasoning, formulating evidential and logical arguments, and presenting and communicating the coherent body of knowledge acquired.

[Non-permissible combination: CCST9037 "Mathematics: A Cultural Heritage"]

Offer Semester: First semester

Day of Teaching: Wednesday

Assessment: 100% coursework

## **Course Co-ordinator**:

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## Teacher(s):

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## Dr K H Chan

Department of Mathematics, Faculty of Science Tel: 2857 8571 Email: mkhchan@hku.hk

## Study Load

Study Load		
Activities		Number of hours
Lectures		24
Tutorials		12
Reading / Self-study		36
Assessment: Essay / Report writing		25
Assessment: Presentation (incl preparation)		10
Assessment: In-class test		1.5
Assessment: Assignments		30
	Total:	138.5

## **Course Learning Outcomes**

On completing the course, students will be able to:
1. Demonstrate understanding of important applications of mathematics in our everyday life.
2. Apply mathematical ideas and methods to decision making on everyday issues.
3. Investigate the mathematical foundation of topics that are related to everyday life.
4. Communicate daily life problems and solutions using appropriate mathematical terminology and good English.
5. Solve real-life problems using mathematics and present the solutions using appropriate software.

## Assessment

Assessment Tasks	Weighting
Written assignment	35
Mini project and group presentation	35
In-class test	30

## Required Reading

Bryan, K., & Leise, T. (2006). The \$25,000,000,000 eigenvector: The linear algebra behind Google. *Siam Review*, 48(3), 569-581.

Gura, E-Y., & Maschler, M. (2008). *Insights into game theory: An alternative mathematical experience*. Cambridge: Cambridge University Press. [Chap. 3]

Haigh, J. (2003). *Taking chances: Winning with probability* (New ed.). Oxford: Oxford University Press. [Chap.14]

Lysyanskaya, A. (2008). How to keep secrets safe. Scientific American, 299(3), 88-95.

Shermer, M. (2008). The doping dilemma. *Scientific American*, 298(4), 82-89. From http://www.sciam.com/article.cfm?id=the-doping-dilemma

Taylor, A. D., & Pacelli, A. M. (2008). *Mathematics and politics: Strategy, voting, power and proof* (2nd ed.). New York: Springer.

Woolfson, M. M. (2008). *Everyday probability and statistics: Health, elections, gambling and war.* London: Imperial College Press.

## Course Code: CCST9018

**Course Title**: Origin and Evolution of Life

#### **Course Description**:

Among the most fundamental questions we can ask ourselves as human beings are: Where do we come from – how did life begin and evolve? Are we alone – is the Earth unique in our universe in supporting life? and Where are we going – what is the long-term future for humankind? These questions focus on the origin, evolution and future of life, a field of study collectively termed astrobiology. Answers have been sought via scientific inquiry throughout human history, and technological advances have created paradigm shifts in the way that society reconciles new scientific findings with accepted norms and belief-systems. The course will examine: (i) how the conditions for life arose in the universe and how scientific and technological advances have changed this perception over time; (ii) the various scientific threads supporting the appearance of life including humans, and their evolutionary changes over time; and (iii) the societal implications of discovering extraterrestrial life.

Offer Semester: First semester

Day of Teaching: Wednesday

Assessment: 100% coursework

## **Course Co-ordinator:**

Dr S B Pointing School of Biological Sciences, Faculty of Science Tel: 2299 0677 Email: pointing@hku.hk

#### Teacher(s):

Dr G W Porter Faculty of Science Tel: 2241 5195 Email: porterg@hku.hk

## Study Load

Activities	Number of hours
Lectures	24
Tutorials (incl preparation)	18
Reading / Self-study	36

Assessment: Essay / Report writing	24
Assessment: Presentation (incl preparation)	24
Total:	126

## **Course Learning Outcomes**

On completing the course, students will be able to:

1.	Describe how advances in technology have influenced scientific thinking on the origin,	
	evolution and future of life.	
2.	Discriminate between scientific explanations and other belief-based explanations for the origin	
	and evolution of life	

- 3. Describe and explain the societal implications of scientific discoveries relating to the origin, evolution and future of life.
- 4. Evaluate how technological advances can affect the long-term future of humankind.

#### Assessment

Assessment Tasks	Weighting
Video critiques / Self-produced video interview	20
Debate	10
Mini-essay	20
Poster presentation	30
Quizzes and tutorial activities	20

#### **Required Reading**

Grady, M. M. (2001). *Astrobiology*. Washington, DC: Smithsonian Institution Press in association with the Natural History Museum, London.

NASA. Astrobiology Magazine. From http://www.astrobio.net

## Course Code: CCST9019

Course Title: Understanding Climate Change

## **Course Description**:

Climate change is consistently in the news, yet there is little public understanding of what is now one of the biggest issues facing humanity. This course will provide students with the scientific literacy needed to understand climate change and consider existing and proposed solutions. The guiding objective is to promote the understanding needed to evaluate, develop and propose emerging and creative solutions at individual, local and global levels. Students will be required to critically examine different media on the subject including critiques of "An Inconvenient Truth" and "The Great Global Warming Swindle" films that present opposing sides of the climate change argument. Besides lectures, the course will use self-directed web-based learning and "blog" discussions together with a climate lab and field trip to stimulate student thinking. An interest in climate change issues and the ability to think critically and express ideas are the only prerequisites for the course.

Offer Semester: First semester

Day of Teaching: Wednesday

Assessment: 100% coursework

## **Course Co-ordinator:**

Dr Z H Liu Department of Earth Sciences, Faculty of Science Tel: 2859 2831 Email: zhliu@hku.hk

## Teacher(s):

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## Dr J A King

Department of Earth Sc	iences, Faculty of Science
Tel: 2241 5473	Email: jessking@hkucc.hku.hk

# Study Load

Activities		Number of hours
Lectures		16
Practical classes		4
Tutorials		8
Seminars		4
Fieldwork / Visits		8
Reading / Self-study		80
Palaeoclimate laboratory		4
Blog participation		2
Assessment: Essay / Report writing		18
Assessment: Presentation (incl preparation)		4
	Total:	148

## **Course Learning Outcomes**

(	On	completing the course, students will be able to:
	1.	Describe, explain and connect the basic principles, concepts and theories, pertaining to the
		climate change debate using appropriate scientific language.
1	2.	Describe and explain how climate change impacts everyday life and society.
	3.	Critically assess films and other media information (e.g. from the Internet, the popular press,
		books, journals) on the climate change debate.
4	4.	Work constructively in peer-selected groups to produce a presentation.
	5.	Demonstrate public speaking skills.

#### Assessment

Assessment Tasks	Weighting
Essay	20
Multiple choice quiz	20
Group presentation and blog	20
Fieldtrip worksheet	10
Laboratory report	30

## **Required Reading**

Caron, Z., & May, E. (2009). *Global warming for dummies*. Mississauga, ON: J. Wiley & Sons Canada.

Weekly or bi-weekly reading from the Internet such as *Science News*, *Science*, *The Washington Post*, *The New York Times*, *South China Morning Post*, etc.

## Course Code: CCST9021

Course Title: Hong Kong: Our Marine Heritage

#### **Course Description**:

This course will provide students with an in-depth understanding of our marine heritage in relation to its historical, social, economical, physicochemical, and ecological aspects. In particular, the course will acquaint students with key principles and skills to resolve the environmental problems with respect to the sustainable development of marine natural resources. Students will also explore the positive and negative impacts of science and technology such as those demonstrated in the evolution of fishing gear and chemical use. Eventually, students will learn how to critically analyze the various situations, problems, conflicts and solutions regarding the use and management of our marine resources.

## Offer Semester: Second semester

#### Day of Teaching: Wednesday

Assessment: 100% coursework

## **Course Coordinator**:

Dr K M Y Leung School of Biological Sciences, Faculty of Science Tel: 2299 0607 Email: kmyleung@hkucc.hku.hk

## Teacher(s):

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Professor Y Sadovy

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## Study Load

Activities		Number of hours
Lectures		24
Tutorials		12
Reading / Self-study		64
Self-learning exercises through museum and site visits		20
Assessment: Group project / Presentation (incl preparation)		20
Assessment: Essay / Report writing		20
	Total:	160

## **Course Learning Outcomes**

On	completing the course, students will be able to:
1.	Demonstrate in-depth understanding of our marine heritage in relation to its historical, societal,
	physicochemical, and ecological aspects.
2.	Critically analyze the various situations, problems and conflicts with respect to the use and
	management of our marine resources.
3.	Apply essential principles and skills to resolve the environmental problems in relation to the
	sustainable development of marine natural resources.
4.	Appreciate our own culture related to history of the unique marine heritage in contrast to the
	cultures in other jurisdictions.
5.	Demonstrate understanding of the potential positive and negative impacts of science and
	technology such as those demonstrated in fishing gears' evolution.
6.	Ascertain self-learning habits, problem solving and communication skills through various
	learning activities.

#### Assessment

Assessment Tasks	Weighting
Selfl-learning exercises	30
Group project	30
Tutorial participation and individual presentation	20
Essay writing	20

## **Required Reading**

Blewitt, J. (2008). Understanding sustainable development. London: Earthscan. [e-book]

Environmental Protection Department. (2006). 20 years of marine water quality monitoring in Hong Kong, 1986-2005. Hong Kong: Environmental Protection Department, HKSAR Government. From http://www.epd.gov.hk/epd/misc/marine\_quality/1986-2005/

Rogers, P. P., Jalal, K. F., & Boyd, J. A. (2008). *An introduction to sustainable development*. London; Sterling, VA: Earthscan. [e-book]

Tsang, S. Y. S. (2004). A modern history of Hong Kong. London: I. B. Tauris. [e-book]

## Course Code: CCST9022

Course Title: How the Mass Media Depicts Science, Technology and the Natural World

## **Course Description**:

Public understanding and perception of science and technology issues are heavily shaped by their depictions in the mass media. This course aims at helping students to understand what is science from the point of view of scientists, to become discerning and critical consumers of science and technology as depicted in the mass media, and to be able to critically understand how science and technology influence our daily life from multiple perspectives. In this course, we first introduce the scientific method (i.e., observations, hypothesis, prediction, experiment, and theory) and how it is applied in the real world (e.g., issues such as public/private funding source, control sample, statistics, and press-release versus peer-reviewed publications). We then introduce elements of media criticism and how the media shape our view of the world.

Offer Semester: Second semester

Day of Teaching: Wednesday

Assessment: 100% coursework

## **Course Co-ordinator**:

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## Teacher(s):

Dr H F Chau Department of Physics, Faculty of Science Tel: 2859 1925 Email: hfchau@hkusua.hku.hk

## Mr T Abraham

Journalism and Media Studies Centre, Faculty of Social Sciences Tel: 2219 4017 Email: thomas@hkucc.hku.hk

## **Study Load**

Activities		Number of hours
Lectures		22
Tutorials		10
Reading / Self-study		60
Assessment: Presentation (incl preparation)		15
Assessment: Case study		15
Assessment: Mini-project		15
Assessment: In-class quizzes (incl revision time)		8
	Total:	145

#### **Course Learning Outcomes**

On	On completing the course, students will be able to:		
1.	Define the scientific method and recognize how it is applied in the real world.		
2.	Describe how the mass media shapes our view of the modern world.		
3.	Explain how the public understanding and perception of science and technology issues is		
	shaped by the mass media.		
4.	Critically appraise the depiction of science in the media and in popular culture: learning to		
	formulate opinions on facts depicted, seeing how it shapes our society.		

#### Assessment

Assessment Tasks	Weighting
Examination	20
Individual mini-project	30
Group presentation	20
Case study	30

## **Required Reading**

Day, R. A., & Gastel, B. (2006). *How to write and publish a scientific paper*. Westport, CT: Greenwood Press.

Erickson, M. (2005). *Science, culture and society: Understanding science in the twenty-first century.* Cambridge, UK: Polity.

Goldacre, B. (2009). Bad science. London: Fourth Estate.

Gregory, J., & Miller, S. (1998). *Science in public: Communication, culture, and credibility*. New York: Plenum Trade.

Hargreaves, I., & Ferguson, G. (2000). *Who's misunderstanding whom?* Swindon, UK: Economic and Social Research Council.

Sagan, C. (1997). *The demon-haunted world: Science as a candle in the dark*. New York: Ballantine Books.

Scanlon, E. (1999). Communicating science: Contexts and channels. London; New York: Routledge.

Silverstone, R. (1985). *Framing science: The making of a BBC documentary*. London: British Film Institute Publishing.

The nature of Nature. (2009, April 25). The Economist, 390(8628), 83-84.

#### Course Code: CCST9023

Course Title: The Oceans: Science and Society

#### **Course Description**:

The oceans are the last frontier on earth. They cover 70% of the earth surface, and yet we have mapped only 5% of the ocean floors. Given that the oceans are the primary reason that the Earth is habitable, increasing our understanding of this system and its role in the development of civilization, and our interdependence on the oceans' many resources is critical. In this course we will explore the interactions between humans and the oceans throughout civilization. Humans rely on the oceans for water supply, food, energy, and military and economic activities. We will discuss how historical and recent oceanographic explorations have enlightened our understanding of the earth and contributed to the advancement of technology. The course will also explore the human impacts on the oceans and how such impacts could in turn produce adverse effects on civilization – including climate change.

Offer Semester: Second semester

Day of Teaching: Wednesday

Assessment: 100% coursework

#### **Course Co-ordinator:**

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**Teacher(s)**: Dr S C Chang

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Dr J A King Department of Earth Sciences, Faculty of Science Tel: 2241 5473 Email: jessking@hkucc.hku.hk Dr C E Dingle

Department of Earth S	ciences, Faculty of Science
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## Study Load

Activities	Number of hours
Lectures	22
Tutorials	8
Practical (laboratory) classes	4
Fieldwork / Visits	8
Reading / Self-study	60
Assessment: Fieldtrip quiz (incl preparation)	2
Assessment: Essay / Laboratory report writing	15
Assessment: Debate presentation (incl preparation)	10
Assessment: Final class MCQ (incl preparation)	15
Total:	144

#### **Course Learning Outcomes**

On completing the course, students will be able to:

1. Describe the scientific process and how it relates to oceanography.

	2.	Describe how global conflict and the quest for food and resources led to advancement in our
understanding of the oceans.		understanding of the oceans.
Ī	3.	Evaluate critically the physical, chemical and biological impacts of human activities on the

ocean systems.
4. Apply knowledge on the human dependence on the oceans to decision making on policies pertaining to their management.

#### Assessment

Assessment Tasks	Weighting
Black box assignment	15
Field trip worksheet and MCQ	15
Laboratory report	15
Essay	10
Mini-debate	15
Final class MCQ	30

## **Required Reading**

These readings are subject to change. More appropriate literature may be available later.

Charnock, H. (1973). H.M.S. *Challenger* and the development of marine science. *The Journal of Navigation*, 26(1), 1-12.

Imbrie, J., & Imbrie, K. P. (1979). *Ice age: Solving the mystery*. Short Hills, NJ: Enslow Publishers. [The Deep and the Past, pp. 123-133]

Kious, W. J., Tilling, R. I., & Geological Survey (U.S.). (1994). *This dynamic earth: The story of plate tectonics*. Washington, DC: U.S. Geological Survey. [Developing the Theory, pp. 14-30; Also available from <u>http://pubs.usgs.gov/publications/text/developing.html</u>]

Powell, H. (2008). Fertilizing the ocean with iron. Oceanus, 46(1), 4-9.

Reves-Sohn, R. (2004). Unique vehicles for a unique environment. Oceanus, 42(2), 25-27.

Safina, C. (1995). The world's imperiled fish. Scientific American, 273(5), 46-53.

Smith, L. (2008, May 24). Titanic search was cover for secret Cold War subs mission. The Times.

Viviano, F. (2005). China's Great Armada. National Geographic, 208(1), 28-53.

## Course Code: CCST9026

Course Title: Scientific Revolutions and their Impact on Modern Societies

Course Description:

The main purpose of this course is to review some of the most important scientific revolutions that took place in the history of science (Heliocentric, Newtonian, the Chemical, the Relativistic, the Quantum, and the Darwinian revolutions), and to present and discuss their historical context, and origin, the struggle of the individual scientists for scientific truth, and how they succeeded in changing the dominant views on nature and society. The scientific revolutions had a deep social impact, by changing the world and the way of life through the development of new technologies, and shaping a new social order. The course will promote open discussion on the social contexts and socio-cultural impacts of the major scientific discoveries. Scientific knowledge and the procedures used by scientists influence the way many individuals in society think about themselves, others, and the environment, and deeply influence the way of life of common people through technology. The course will address the following fundamental issues: what is science and how it works; the nature of research; normal science (paradigm), and its development; scientific anomaly and the shift in professional commitments to shared assumptions; the scientific revolution and its meaning and consequences; and the social impact of the scientific revolution.

**Offer Semester**: First semester

Day of Teaching: Wednesday

Assessment: 100% coursework

#### **Course Co-ordinator:**

Professor K S Cheng Department of Physics, Faculty of Science Tel: 2859 2368 Email: hrspksc@hkucc.hku.hk

## Teacher(s):

Professor K S Cheng Department of Physics, Faculty of Science Tel: 2859 2368 Email: hrspksc@hkucc.hku.hk

## Professor A S C Cheung

Department of Chemistry, Faculty of Science Tel: 2859 2155 Email: hrsccsc@hku.hk

## Dr T C Harko

Department of Physics, Faculty of Science Tel: 2241 5747 Email: harko@hkucc.hku.hk

#### Study Load

Activities		Number of hours
Lectures		22
Tutorials		11
Seminars		2
Reading / Self-study		40
Assessment: Presentation (incl preparation)		30
Assessment: In-class test (incl preparation)		28
	Total:	133

## **Course Learning Outcomes**

On completing the course, students will be able to:
1. Describe and explain the most important scientific revolutions that took place in science, their causes, and their historical context.
2. Use the relevant information about the scientific revolutions to critically examine their social impact.
3. Apply the knowledge obtained from the course to assess the impact on society of the major scientific discoveries of the future.
4. Examine the role of science in modern human history.
5. Analyze the impact of science in larger socio-cultural context.

## Assessment

Assessment Tasks	Weighting	
In-class test	40	
Individual mini-project-essay	20	
Group presentation	20	
Reading assignments	20	

## **Required Reading**

Selected chapters from:

Barrow, J. D. (2005). The artful universe expanded. Oxford; New York: Oxford University Press.

Barrow, J. D. (2008). *Cosmic imagery: Key images in the history of science* (1st Amer. ed.). London: Bodley Head.

Feyerabend, P. (1987). Farewell to reason. London; New York: Verso.

Galison, P., Gordin, M. D., & Kaiser, D. (2001). *Science and society: The history of modern physical science in the twentieth century*. New York: Routledge.

Hall, A. R. (1994). Science and society: Historical essays on the relations of science, technology, and medicine. Aldershot, UK: Variorum.

Kuhn, T. S. (1996). *The structure of scientific revolutions* (3rd ed.). Chicago, IL: University of Chicago Press.

Popper, K. R. (2002). The logic of scientific discovery. London: Routledge Classics.

## Course Code: CCST9028

Course Title: Critical Thinking about Science and Technology

## **Course Description**:

Science and technology are important parts of modern life, and understanding of scientific concepts is necessary to form an informed judgment on a range of topics from claims in product advertisements to policies on global issues. This process can be complex due to the abundance of easily available information. Thus, it is necessary to be able to distinguish between facts and fallacies and discriminate between different claims.

This course aims to help students to develop critical thinking skills and to apply them to a variety of science and technology issues. To achieve this aim, the course will first cover the general topics about scientific method and critical thinking, with numerous examples of both good and bad research practices, examples of misleading advertising, and controversial policy issues. The principles of critical thinking and sound scientific research will then be applied to several specific topics, which will be selected among the following areas: nanotechnology, global warming, pesticide use, nuclear energy, biofuels, alternative medicine and health supplements industry, genetic engineering, cloning and stem cell research, health risks of modern lifestyles, and threats of global epidemics.

[Non-permissible combination: CCST9035 "Making Sense of Science-related Social Issues"]

Offer Semester: Second semester

Day of Teaching: Wednesday

Assessment: 75% coursework; 25% examination

Course Co-ordinator: Dr A Djurisic Department of Physics, Faculty of Science Tel: 2859 7946 Email: dalek@hku.hk

**Teacher(s)**: Dr A Djurisic Department of Physics, Faculty of Science

## Tel: 2859 7946 Email: dalek@hku.hk

#### **Study Load**

Brudy Loud	
Activities	Number of hours
Lectures	24
Tutorials	10
Reading / Self-study	60
Assessment: Essay / Report writing	10
Assessment: Presentation (incl preparation)	20
Assessment: Poster (incl preparation of own poster and grading other	20
posters)	
Assessment: Examination (incl preparation)	12
Total:	156

#### **Course Learning Outcomes**

On	completing the course, students will be able to:		
1.	Find the information on a specific topic, understand the scientific terminology, explain and		
	interpret the relevant information, and examine its validity.		
2.	Describe and explain the interplay between science and technology, government policies,		
	economics, and society.		
3.	Critically examine different science and technology issues relevant to their daily life.		
4.	. Compare information from different sources, discriminate between information with different		
	reliability, and form an informed opinion about scientific controversies.		
Asse	Assessment		

Assessment Tasks	Weighting
Assignments	0
Poster	45
Group presentations and debates	30
Examination	25

#### **Required Reading**

Easton, T. A. (2010). *Taking sides: Clashing views on controversial issues in science, technology, and society* (9th ed.). Boston: McGraw Hill Higher Education. [Older editions are also acceptable]

Vaughn, L. (2008). The power of critical thinking: Effective reasoning about ordinary and extraordinary claims. New York: Oxford University Press.

Yudkin, B. (2006). *Critical reading: Making sense of research papers in life sciences and medicine*. London: Routledge.

#### **Course Code**: CCST9030

Course Title: Forensic Science: Unmasking Evidence, Mysteries and Crimes

#### **Course Description**:

Modern forensic science covers multiple scientific disciplines such as chemistry, physics, biology, medicine, computing, engineering, etc. This course will lead students to explore the world of modern forensic science through a series of selected forensic science topics interplayed with interesting, famous or mysterious crime case studies and problem-based learning tutorials. Additionally, hands-on practicals will enable students to carry out the collection of, and examination and analysis on, several types of forensic materials, including hairs and fibers, fingerprints and soil samples, which can be found in everyday life. Through the hands-on work, students can appreciate the possible gap between theory and practice, which will help them develop in-depth understanding of the scientific topics taught in lectures or read from books as well as applying and verifying ideas and theories in practice. In additional to introducing students to the underlying scientific, legal and ethical concepts of crime investigation, knowledge gained in the course will be used by students to critically analyze assigned crime cases and generate logical solutions. All course contents including practicals are designed to be suitable for students having little or no science training.

[Non-permissible combination: CCST9010 "The Science of Crime Investigation"]

**Offer Semester**: Second semester (Course will be offered twice)

Day of Teaching: Wednesday

Assessment: 100% coursework

#### **Course Co-ordinator**:

Professor D L Phillips Department of Chemistry, Faculty of Science Tel: 2859 2160 Email: phillips@hkucc.hku.hk

#### Teacher(s):

Professor D L Phillips Department of Chemistry, Faculty of Science Tel: 2859 2160 Email: phillips@hkucc.hku.hk

#### Dr W T Chan

Department of Chemistry, Faculty of Science Tel: 2859 2156 Email: wtchan@hku.hk

Dr A S T Wong

School of Biological Sciences, Faculty of Science Tel: 2299 0865 Email: awong1@hku.hk

Dr B L Lim

School of Biological Sciences, Faculty of Science Tel: 2299 0826 Email: bllim@hkucc.hku.hk

#### Study Load

Study Loud	
Activities	Number of hours
Lectures	24
Tutorials	12
Reading / Self-study	40
Case study of a crime scence	20
Assessment: Essay / Report writing	20
Assessment: Presentation (incl preparation)	10
Assessment: Laboratory practicals including preparation, performance	20
and report writing	
Assessment: Quizzes	4
Total:	150

#### **Course Learning Outcomes**

On	completing the course, students will be able to:
1.	Describe and explain how scientific and technological principles are being applied in modern
	forensic science.
2.	Demonstrate good understanding of how modern forensic science is being applied to uphold
	justice in the society and solve crimes in everyday life.
3.	Investigate and apply forensic principles and analysis on evidences/samples gathered by
	students.
4.	Apply critical thinking and scientific knowledge systematically on uncertain and unfamiliar situations, starting from identifying and defining problems, gathering evidences, analytical reasoning and group discussion, to finally generating solutions to solve the problem of crime case studies.

#### Assessment Tasks

Assessment Tasks	Weighting
Case studies and problem-based learning tutorial	20
Individual collection of references into a personal reference folder	20
with a summary report and a group presentation	
Assignments and laboratory reports	30
Quizzes	30

#### **Required Reading**

General:

Saferstein, R. (2007). *Criminalistics: An introduction to forensic science*. Upper Saddle River, NJ: Pearson Prentice Hall.

#### Case studies:

Evans, C. (2003). A question of evidence: A casebook of great forensic controversies, from Napoleon to O. J. Hoboken, NJ: John Wiley & Sons.

Evans, C. (2004). *Murder two: The second casebook of forensic detection*. Hoboken, NJ: John Wiley & Sons.

Lee, H. C., & O' Neil, T. (2004). *Cracking more cases: The forensic science of solving crimes*. Amherst, NY: Prometheus Books.

Owen, D. (2000). *Hidden evidence: 40 true crimes and how forensic science helped solve them.* Willowdale, Ontario: Firefly Books.

#### Course Code: CCST9036

Course Title: Material World: Past, Present, and Future

#### **Course Description**:

The civilization and technology of humankind in the pre-historical period may be described by the type of materials used. The transition from one period to another reflects the evolution in human civilization and their skills in making and processing materials. Analyzing the chemical components in archaeological objects is indeed a very important tool to identify when these objects were made. The rapid advancement in modern technology is also a consequence of the development of many new types of materials. For example, the discovery of silicon in 19th century and the invention of the transistor in 20th century paved the road for the "information age".

This course is designed to equip students with a general understanding that the development of materials by humankind in history has a close relationship with human civilization. The organization of the course will be based on the development of materials by humankind in chronological order, and the underlying scientific principles. The principles related to the preparation, processing, and functions of different types of materials will be integrated into the topics presented.

Offer Semester: Second semester

Day of Teaching: Wednesday

Assessment: 100% coursework

#### **Course Co-ordinator**:

Professor W K Chan Department of Chemistry, Faculty of Science Tel: 2859 8943 Email: waichan@hku.hk

#### Teacher(s):

Professor W K Chan Department of Chemistry, Faculty of Science Tel: 2859 8943 Email: waichan@hku.hk

Study Load Activities

Number of hours

Lectures	24
Tutorials	8
Seminars	4
Reading / Self-study	20
Practical sessions	12
Assessment: Essay / Report writing	20
Assessment: Presentation (incl preparation)	10
Assessment: In-class test	2
Assessment: Group Project	40
Total:	140

#### **Course Learning Outcomes**

On completing the course, students will be able to:

On	completing the course, students will be usic to:
1.	Identify, describe, and compare some essential materials used by human in the past and
	present, and to explain the basic scientific principles of how there materials function.
2.	Describe and explain the relationship between the usage of materials and advancement in
	human civilization.
3.	Identify problems related to the improper usage and disposal of materials, and describe the
	impact of these problems to our society.
4.	Analyze simple scientific problems related to materials, to design and conduct simple
	experiments to solve these problems, and to organize, present, and discuss their findings in
	pubic or other workshops.
Asse	essment

## Assessment TasksWeightingMini group project30Presentation of project15Participation in practical sessions10Participation in discussion group5Final quiz40

#### **Required Reading**

Arunachalam, V. S. & Fleischer, E. L. (2000). Behind the themes and between the lines: Materials challenges for the next century. *MRS Bulletin*, 25(1), 3.

Arunachalam, V. S., & Fleischer, E. L. (2001). Materials challenges for the next century: A concluding note. *MRS Bulletin*, 26(12), 1020-1021.

Cottrell, A. (2000). A centennial report: Looking back on 100 years of materials of development. *MRS Bulletin*, 25(2), 125-132.

#### Course Code: CCST9037

Course Title: Mathematics: A Cultural Heritage

#### **Course Description**:

Mathematics is one of the major threads, together with language, science, and the arts, that have woven the beautiful fabric of human civilization. Through examples gathered from the long history of humankind, around our daily lives, and in diverse areas of human activities, this course aims to help students to comprehend how mathematics was, and is being, developed as a work of human endeavour with cultural, intellectual, and social contexts. We will also investigate the role of mathematics in the development of other areas of our civilization. In particular we shall examine the interplay between mathematics and other cultural pursuits such as philosophy, the arts, and science and technology, and to study how they have affected each others' development. Rather than transmitting a body of technical knowledge in mathematics, our emphasis is placed on appreciating, contemplating, and examining the beauty, the utility, and the "Way" of mathematics, as well as the intricate relationship between mathematics and other human cultural pursuits.

The demand on technical preparation in mathematics is minimal, say up to the level of the general mathematics curriculum in secondary school, but the student is expected to possess intellectual curiosity and willingness to participate in the reasoning process.

[Non-permissible combination: CCST9017 "Hidden Order in Daily Life: A Mathematical Perspective"]

#### Offer Semester: Second semester

Day of Teaching: Wednesday

Assessment: 100% coursework

#### **Course Co-ordinator:**

Dr N K Tsing Department of Mathematics, Faculty of Science Tel: 2859 2251 Email: nktsing@hku.hk

#### Teacher(s):

Dr N K Tsing Department of Mathematics, Faculty of Science Tel: 2859 2251 Email: nktsing@hku.hk

#### Dr S P Yung

Department of Mathematics, Faculty of Science Tel: 2859 1992 Email: spyung@hkucc.hku.hk

#### Dr T W Ng

Department of Mathematics, Faculty of Science Tel: 2241 5631 Email: ntw@maths.hku.hk

#### Study Load

Activities	Number of hours
Lectures	24
Tutorials	10
Reading / Self-study	60
Assessment: Essay / Report writing	30
Assessment: Weekly assignments	20
Total:	144

#### **Course Learning Outcomes**

On completing the course, students will be able to:

- 1. Appreciate and describe the beauty, the utility, and the "Way" of mathematics.
- 2. Comprehend and describe how mathematics was and is being developed as a work of human culture.
- 3. Investigate and describe the interplay among mathematics and other areas of human culture.
- 4. Investigate and explain the role of mathematics in the development of civilization.

#### Assessment

Assessment Tasks	Weighting
In-class worksheets	10
Weekly assignments	30
Tutorial discussions	20
Essay	40

#### **Required Reading**

Selected sections from:

Calinger, R. (1999). *A contextual history of mathematics*. Upper Saddle River, NJ: Prentice Hall. Davis, P. J., & Hersh, R. (1998). *The mathematical experience*. Boston: Houghton Mifflin.

Selected excerpts from other books. Selected articles from journals, magazines, and newspapers.

#### Course Code: CCST9038

Course Title: Science and Science Fiction

#### **Course Description**:

Science fiction represents a blend of science, social science and arts. It frequently draws inspiration from science, as well as addressing the social issues relevant today by highlighting certain social aspects. Science fiction also serves to popularize science and affects public opinion about certain scientific and technological issues. Therefore, there is a complex relationship between science and science fiction, and understanding this relationship requires its analysis from multiple perspectives.

This course will cover the topics of the influence of science on science fiction, the influence of science fiction on science, and the influence of science fiction on public perception of science and scientists. These topics will be discussed in the context of examples of science fiction works dealing with space exploration and space travel, time travel, near future fiction, and science fiction dealing with social issues. The science concepts involved in these topics will be briefly explained at a layperson level, and the main emphasis will be placed on critical thinking and analyzing interdisciplinary connections and relationships.

#### Offer Semester: First semester

Day of Teaching: Wednesday

Assessment: 100% coursework

#### **Course Co-ordinator**:

Dr A Djurisic Department of Physics, Faculty of Science Tel: 2859 7946 Email: dalek@hku.hk

#### Teacher(s):

Dr A Djurisic Department of Physics, Faculty of Science Tel: 2859 7946 Email: dalek@hku.hk

#### Study Load

Activities		Number of hours
Lectures		22
Tutorials		12
Reading / Self-study		60
Assessment: Essay / Report writing		25
Assessment: Presentation (incl preparation)		30
Assessment: In-class test (incl preparation)		12
	Total:	161

#### **Course Learning Outcomes**

On completing the course, students will be able to:

1. Describe what is science fiction and classify different types of science fiction.

2. Illustrate the use and misuse of science as a plot device.

- 3. Describe and explain the influence of science on science fiction and vice versa.
- 4. Appraise and evaluate scientific and societal relevance of science fiction works.

#### Assessment

Assessment Tasks	Weighting
Debates in tutorials and short assignments	0

Group presentation	45
Short essay	30
In-class test	25

#### **Required Reading**

Lambourne, R. J., Shallis, M., & Shortland, M. (1990). *Close encounters? Science and science fiction*. Bristol, UK: Adam Hilger.

Stocker, J. H. (Ed.). (1998). *Chemistry and science fiction*. Washington, DC: American Chemical Society.

At least one of the books from the list of examples of works provided. Science fiction books not on the list can be acceptable if approved by the course coordinator.

#### Course Code: CCST9039

Course Title: Statistics and Our Society

#### **Course Description**:

The course seeks to expose students to a range of statistical concepts and perspectives essential to the understanding of different scientific, social and economic issues. The course consists of two parts. The first part aims at enhancing students' understanding of some fundamental statistical principles and concepts. This enables them to comprehend and assess critically the statistical analyses presented in various sources, such as news media and research reports which they would frequently come across in their daily lives. The second part introduces students to a range of major official statistical series compiled by the Government and selected statistics compiled by non-government organizations, the academia, and private companies. Key concepts and methodologies underlying the compilation of these statistics will be covered. The focus of this part is on analyzing and interpreting the interrelatedness among Hong Kong, Mainland China and other major territories in the world, and understanding various socio-economic issues through studying different sets of statistics. Through a more in-depth understanding of the proper interpretation and application of statistics, students will be able to compare and formulate solutions using appropriate statistics in discerning the complexities and cross-disciplinary nature of real life issues.

[Non-permissible combination: CCST9002 "Quantitative Literacy in Science, Technology and Society"]

Offer Semester: Second semester

Day of Teaching: Wednesday

Assessment: 60% coursework; 40% examination

#### **Course Co-ordinator**:

Dr K C Cheung Department of Statistics and Actuarial Science, Faculty of Science Tel: 2859 1987 Email: kccg@hku.hk

Teacher(s):Dr K C CheungDepartment of Statistics and Actuarial Science, Faculty of ScienceTel: 2859 1987Email: kccg@hku.hk

Professor W K Li Department of Statistics and Actuarial Science, Faculty of Science Tel: 2859 2473 Email: hrntlwk@hku.hk

Dr L H Yu Department of Statistics and Actuarial Science, Faculty of Science

#### Tel: 2857 8321 Email: plhyu@hku.hk

#### **Study Load**

Stady 20tha	
Activities	Number of hours
Lectures	24
Tutorials	12
Reading / Self-study	30
Assessment: Group project	30
Assessment: Examination (incl preparation)	30
Total:	126

#### **Course Learning Outcomes**

On completing the course, students will be able to:

1. Demonstrate understanding of some commonly used probability and statistical concepts.

2. Evaluate and interpret critically statistics reporting from the press and various research reports.

- 3. Analyze problems and make logical decisions from a statistical perspective.
- 4. Analyze the inter-relatedness among different territories, appraise the socio-economic wellbeing of a territory through statistics.

#### Assessment

Assessment Tasks	Weighting
Written examination	40
Group project (written report)	40
Tutorial participation and performance	20

#### **Required Reading**

There is no official textbook for the course. Lecture notes will be distributed and all required readings will be provided.

#### Course Code: CCST9043

Course Title: It's All About Time

#### **Course Description**:

This course will introduce students to a well-known but poorly understood phenomenon, time. We all have a personal concept of time since it drives our lives minute by minute, and day after day. It changes us over our lifetime yet it is one of the greatest mysteries to humankind. In this course, we will discuss the concept of time and how it profoundly affects our everyday lives from different yet connected angles: cosmological, biological, geological, historical and cultural. We will explore the fundamental definition of time, how we measure it, how it is essential to the development of humankind. We will examine the patterns and laws that are exposed in the progression of events. We will investigate the concept of evolution, one of the greatest discoveries in the history of science as an intrinsic property of life and other components of nature.

Offer Semester: Second semester (Not offered in 2012-13)

Day of Teaching: Wednesday

Assessment: 80% coursework; 20% examination

#### **Course Co-ordinator:**

Professor J G Malpas Department of Earth Sciences, Faculty of Science Tel: 2859 2103 Email: jgmalpas@hku.hk

#### Teacher(s):

Professor J G Malpas Department of Earth Sciences, Faculty of Science Tel: 2859 2103 Email: jgmalpas@hku.hk

#### Dr Y Li Department of Earth Sciences, Faculty of Science Tel: 2859 8021 Email: yiliang@hku.hk

#### **Study Load** Activities Number of hours Lectures 20 10 Tutorials Seminars 12 Fieldwork / Visits 2 Reading / Self-study 30 Movie and discussion 5 Problem-based Learning sessions 10 20 Assessment: Essay / Report writing Assessment: Presentation (incl preparation) 20 Assessment: Examination 2 Total: 131

#### **Course Learning Outcomes**

On completing the course, students will be able to:

1.	Describe and explain the concept of Time and how it has been measured and perceived in
	different stages of the story of human civilization.
2.	Elaborate critically on an ordinary, everyday phenomenon such as Time, and on its role in the
	development of knowledge and its consequences for modern society.
3.	Use the familiar concept of Time to derive connection and commonalities between different
	aspects and disciplines of science and the humanities.
4.	Demonstrate an understanding of the universal beauty of natural science and obtain a better
	understanding of the nature of Time as perceived in different cultures.
5.	Realize the importance of good management of time.

#### Assessment

Assessment Tasks	Weighting
PBL sessions and group poster presentation	30
Essay	50
Examination	20

#### **Required Reading**

Davis, P. (1996). *About time, Einstein's unfinished revolution*. New York: Simon & Schuster. Holland, C. H. (1999). *The idea of time*. Chichester, UK: John Wiley & Sons Ltd.

# SECTION IX

## **BSc Degree Regulations**

## SCIENCE

Regulations for First Degree Curricula (for students admitted to the first year in 2012-2013 under the 3-year '2010 curriculum')

#### REGULATIONS FOR FIRST DEGREE CURRICULA<sup>1</sup>

(See also General Regulations)

#### **UG1** Definitions:

For the purpose of regulations and syllabuses for all first degree curricula unless otherwise defined —

An 'academic year' comprises two semesters, the first semester to commence in September and end in December, and the second semester to commence in January and end in May/June, on dates as prescribed by the Senate. It includes, normally at the end of each semester, a period during which candidates are assessed. For some curricula, a 'summer semester' may be organized in addition to the normal two semesters. Clinical curricula have extended semesters.

A 'summer semester' normally comprises seven to eight weeks of intensive timetabled teaching and assessment to commence four weeks after the end of the second semester assessment period, and to conclude about one week before the start of the next academic year.

The 'maximum period of registration' is equivalent to a period which is 150% of the curriculum's normative period of study as specified in the degree regulations, provided that where this results in a residual fraction of an academic year, the fractional period shall be extended to one full academic year.

'Degree curriculum' means the entire study requirements for the award of an undergraduate degree.

'Major programme' means the study requirements for a single major area of disciplinary, interdisciplinary or multidisciplinary study, accumulating not fewer than 60 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.

'Course' means a course of study, with a credit value expressed as a number of credit-units as specified in the syllabuses for a degree curriculum.

'Disciplinary elective course' or 'Disciplinary Elective' means any course offered in the same major programme or discipline 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.

'Syllabus' means courses taught by departments, centres, and schools, offered under a degree curriculum.

<sup>&</sup>lt;sup>1</sup> These regulations are applicable to candidates admitted under the 3-year '2010 curriculum' to the first year of first degree curricula in 2012-13. 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 before 2012-13.)

'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' is the number of 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' is 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 6 credits in English language enhancement;
- (b) successful completion of 3 credits in Chinese language enhancement<sup>2</sup>; and
- (c) successful completion of 12 credits of courses in the Common Core Curriculum, selecting no more than one course from each Area of Inquiry.

#### **UG 6 Exemption:**

Candidates may be exempted, with or without special conditions attached, from any of the requirements in UG 5 by the Senate in exceptional circumstances. Candidates who are so exempted must replace the number of exempted credits with courses of the same credit value.

#### 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 satisfactorily completed 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.

<sup>&</sup>lt;sup>2</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*.

#### **UG 8** Grading system:

(a) The grades, their standards and the grade points for assessment shall be as follows<sup>3</sup>:

Grade		Standard	Grade Point
A+	٦		4.3
А	}	Excellent	4.0
A-	J		3.7
B+	ſ		3.3
В	}	Good	3.0
B-	J		2.7
C+	٦		2.3
С	}	Satisfactory	2.0
C-	J	·	1.7
D+		Pass	1.3
D		r ass	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 calculation of the GPA.

#### **UG 9** Honours classifications:

(a) Honours classifications shall be awarded in five divisions<sup>4</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	CGPA range
First Class Honours	3.60 - 4.30
Second Class Honours	(2.40 - 3.59)
Division One	3.00 - 3.59
Division Two	2.40 - 2.99
Third Class Honours	1.70 - 2.39
Pass	1.00 - 1.69

- (b) Honours classification may not be determined solely on the basis of a candidate's Cumulative GPA and the Board of Examiners for the degree may, at its absolute discretion and with justification, award a higher class of honours to a candidate deemed to have demonstrated meritorious academic achievement but whose Cumulative GPA falls below the range stipulated in UG9(a) of the higher classification by not more than 0.05 Grade Point.
- (c) A list of candidates who have successfully completed all degree requirements shall be posted on Faculty noticeboards.

<sup>&</sup>lt;sup>3</sup> UG 8 is not applicable to the BDS and MBBS curricula.

<sup>&</sup>lt;sup>4</sup> UG 9 is not applicable to the BChinMed, BDS and MBBS.

Regulations for First Degree Curricula (for students admitted to the first year in 2010-2011, 2011-2012 and admitted directly to the second year in 2011-2012 and 2012-2013)

#### REGULATIONS FOR FIRST DEGREE CURRICULA<sup>1</sup>

(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 for a single major area of disciplinary, interdisciplinary or multidisciplinary study, accumulating not fewer than 60 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.

'Course' means a course of study, with a credit value expressed as a number of credit-units as specified in the syllabuses for a degree curriculum.

'Disciplinary elective course' or 'Disciplinary Elective' means any course offered in the same major programme or discipline 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.

'Syllabus' means courses taught by departments, centres, and schools, offered under a degree curriculum.

<sup>&</sup>lt;sup>1</sup> These regulations are applicable to candidates admitted to the first year of first degree curricula in 2010-11 and thereafter. 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 2009-10 for the Regulations for First Degree Curricula applicable to cohorts admitted before 2010-11.)

'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, and is calculated by the total of the product of grade points earned for each course attempted (including failed courses) and its credit value being 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' is the number of 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.

'Weighted Grade Point Average' or 'Weighted GPA' is the GPA in respect of courses attempted by a candidate calculated with weighted factors defined by the Board of the Faculty.

'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' is 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 required to discontinue 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, 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 6 credits in English language enhancement;
- (b) successful completion of 3 credits in Chinese language enhancement<sup>2</sup>; and
- (c) successful completion of 12 credits of courses in the Common Core Curriculum, selecting no more than one course from each Area of Inquiry.

#### **UG 6 Exemption:**

Candidates may be exempted, with or without special conditions attached, from any of the requirements in UG 5 by the Senate in exceptional circumstances. Candidates who are so exempted must replace the number of exempted credits with courses of the same credit value.

#### 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 satisfactorily completed 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.

<sup>&</sup>lt;sup>2</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*.

#### **UG 8 Grading system:**

Grade		Standard	Grade Point
A+	ו		4.3
А	ł	Excellent	4.0
A-	J		3.7
B+	ו		3.3
В	}	Good	3.0
B-	J		2.7
C+	ו		2.3
С	}	Satisfactory	2.0
C-	J		1.7
D+		Pass	1.3
D		Pass	1.0
F		Fail	0

(a) The grades, their standards and the grade points for assessment shall be as follows<sup>3</sup>:

(b) Special permission may be given by Senate for courses in individual curricula to be graded as 'Pass', 'Fail' or 'Distinction'.

<sup>&</sup>lt;sup>3</sup> UG 8 is not applicable to the BDS and MBBS curricula.

*Regulations for First Degree Curricula (for students admitted to the first year in 2009-2010 or before and admitted directly to the second year in 2010-2011)* 

#### REGULATIONS FOR FIRST DEGREE CURRICULA $^{1}$

(see also General Regulations G1-20)

#### UG1 Definitions:

For the purpose of regulations and syllabuses for all first degree curricula unless otherwise defined -

An 'academic year' comprises two semesters, the first semester to commence in September and end in December, and the second semester to commence in January and end in May/June, on dates as prescribed by the Senate. It includes, normally at the end of each semester, a period during which candidates are assessed. For some curricula, a 'summer semester' may be organized in addition to the normal two semesters.

'Course' means a course of study, normally with a credit value (expressed as a number of units, known also as credit-units or credits) as defined in the syllabuses for a degree curriculum.

'Core course' means any of the courses that are mainly offered to candidates following the degree curriculum concerned and must be completed by them in order to fulfill the curriculum requirements.

'Elective course' or 'Elective' means any of the courses other than core courses that can be taken by candidates in order to complete the degree curriculum.

'Syllabus' means courses or a combination of courses taught by departments, centres, schools and programmes, offered under a degree curriculum.

'Prerequisite' means a course or a group of courses which candidates must have taken and/or 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 weight assigned to each course relative to the total study load under a degree curriculum. The number of credits is normally indicative of the contact hours, study time and/or candidate workload associated with the course. Candidates who satisfactorily complete courses with a credit value earn the credits of these courses.

'Semester Grade Point Average' or 'Semester GPA' is the combined grade average of all courses attempted by a candidate (including failed courses) during a given semester, where each course is given a weight, normally equal to its credit-unit value.

'Cumulative Grade Point Average' or 'Cumulative GPA' is the combined grade average of all courses completed successfully by a candidate (failed courses are excluded) at the time of calculation, where each course is given a weight, normally equal to its credit-unit value.

'Weighted Grade Point Average' or 'Weighted GPA' is the combined grade average of all courses taken by a candidate weighted by factors (such as the level of the courses) defined by the Board of the Faculty.

A 'transcript' is 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. The amount of advanced credits to be granted shall be determined by the Board of a Faculty, in accordance with the following principles:

- (a) under the provisions in Statute III.5, a minimum of two semesters of study at this University shall be required before the candidate is considered for the award of the degree; and
- (b) a minimum of 60 credits shall be gained in this University.

<sup>&</sup>lt;sup>1</sup> These regulations are applicable to candidates admitted to the first year of first degree curricula in or after 1998-99, except those in the Bachelor of Medicine and Bachelor of Surgery and the Bachelor of Dental Surgery curricula.

Advanced credits granted shall not normally be included in the calculation of the cumulative GPA, but, if so decided by the Board of Faculty, may be recorded on the transcript of the candidate.

#### UG 3 Requirements for graduation:

To be eligible for admission to the degree, candidates shall fulfill the following requirements in addition to requirements prescribed in the regulations and syllabuses governing the degree curricula:

- (a) Successful completion of a 3-unit English language enhancement course; and a 3-unit Chinese language enhancement course<sup>1</sup>;
- (b) Successful completion, in the manner specified in the regulations and syllabuses governing the degree curricula, of one of the following courses<sup>2</sup>:
  - (i) a 3-unit course or a 6-unit IT-integrated course in Humanities and Social Sciences Studies; or
  - (ii) a 3-unit course or a 6-unit IT-integrated course in Science and Technology Studies.
- (c) Successful completion, in the manner specified in the regulations and syllabuses governing the degree curricula, of one of the following courses<sup>2</sup>:
  - (i) a 3-unit course or a 6-unit IT-integrated course in Culture and Value Studies; or
  - (ii) a 3-unit course which is outside the candidates' own degree curricula, as an elective course; or
  - (iii) a Common Core Course which is outside the candidates' own degree curricula.
- (d) Either (i) successful completion of a 6-unit IT-integrated course in Humanities and Social Sciences Studies, Science and Technology Studies, or Culture and Value Studies, under (b)(i) or (ii) or (c)(i) above;
  - or (ii) obtaining a pass in an information technology proficiency test;
  - or (iii) successful completion of a 3-unit course in information technology;
  - or (iv) satisfying the information technology proficiency requirements as specified in the regulations and syllabuses governing the degree curricula.

#### UG 4 Exemption:

Candidates may be exempted, with or without special conditions attached, from any of the requirements in UG 3 by the Senate in exceptional circumstances.

#### UG 5 Grading system:

The grades, their standards and the grade points for assessment shall be as follows<sup>3,4</sup>:

Grade		Standard	Grade Point
A+	٦		4.0
А	}	Excellent	4.0
A-	J		3.7
B+	٦		3.3
В	}	Good	3.0
В-	J		2.7
C+	٦		2.3
С	}	Satisfactory	2.0
C-	J	2	1.7
D+	ſ	Pass	1.3
D	ſ		1.0
F		Fail	0

<sup>&</sup>lt;sup>1</sup> Candidates who have not studied Chinese language during their secondary education may be exempted from this requirement, see *Regulation UG4*.

<sup>&</sup>lt;sup>2</sup> Students failing to successfully complete courses in Humanities and Social Sciences Studies, Science and Technology Studies or Culture and Value Studies by 2009-10 shall be required to satisfy the requirements in (b) and (c) by taking 6-credit courses in the Common Core Curriculum to be offered from 2010-11 onwards.

<sup>&</sup>lt;sup>3</sup> UG5 is not applicable to the BDS and MBBS curricula.

<sup>&</sup>lt;sup>4</sup> Special permission may be given for courses in individual curricula to be graded as 'Pass', 'Fail' or 'Distinction'.

#### REGULATIONS FOR THE DEGREE OF BACHELOR OF SCIENCE (BSc)

These regulations apply to students admitted under the 3-year curriculum to the first year of the BSc degree curriculum in the academic year 2012-2013 and students admitted directly to the  $2^{nd}$  year in 2013-2014.

(See also General Regulations and Regulations for First Degree Curricula)

#### Definitions

 $Sc1^1$  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 2, 3 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 six semesters of full-time study, extending over not fewer than three 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 five 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 180 credits, in the manner specified in these regulations and the syllabuses.
- (c) Candidates shall take at least 90 credits of Science courses, of which no fewer than 60 credits must be gained from advanced Science courses, including all required courses of the major programme of the BSc degree curriculum, and the Faculty elective courses.
- (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 216 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 360 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 satisfactorily completed 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.

#### 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 180 credits, comprising
  - (i) at least 90 credits of Science courses, of which no fewer than 60 credits must be gained from advanced Science courses; and
  - (ii) all required courses as prescribed in the major programme of the BSc degree curriculum; and the Faculty elective courses.

#### **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 the Degree of Bachelor of Science \* (BSc)

#### 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 2, 3 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 six semesters of full-time study, extending over not fewer than three 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 five academic years.

#### 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.

\* These Regulations apply to students admitted to the first year of study for the Degree of BSc in the academic years 2010-2011 and 2011-2012.

<sup>&</sup>lt;sup>1</sup> This regulation should be read in conjunction with UG1 of the Regulations for First Degree Curricula.

#### 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 180 credits, in the manner specified in these regulations and the syllabuses.
- (c) Candidates shall take at least 90 credits of Science courses, of which no fewer than 60 credits must be gained from advanced Science courses, including all required courses of the major programme of the BSc degree curriculum, and the Faculty elective courses.
- (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 216 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 360 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 required to discontinue their studies if they have:
  - failed to complete successfully 36 or more credits in two consecutive semesters (not including the summer semester), except where they are not required to take such a number of credits in the two given semesters, or
  - (ii) failed to achieve an average Semester GPA of 1.0 or higher for two consecutive semesters, 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 satisfactorily completed 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.

#### Degree classification

- **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 180 credits, comprising
  - (i) at least 90 credits of Science courses, of which no fewer than 60 credits must be gained from advanced Science courses; and
  - (ii) all required courses as prescribed in the major programme of the BSc degree curriculum; and the Faculty elective courses.

**Sc9** The degree of Bachelor of Science shall be awarded in five divisions: First Class Honours, Second Class Honours Division One, Second Class Honours Division Two, Third Class Honours, and Pass. A list of candidates who have successfully completed all the degree requirements shall be posted on Faculty notice boards.

#### Regulations for the Degree of Bachelor of Science \* (BSc)

#### Terminology

Sc1 In these Regulations, and in the Syllabuses for the degree of Bachelor of Science, unless the context otherwise requires -

"Study programme" means a combination of core, elective and general education courses as specified in the syllabus, and approved by the Faculty Board.

"Science Course" means any course offered by the Faculty of Science or the Department of Biochemistry.

"Advanced course" means any level 2, 3 or above course offered by the Faculty of Science or the Department of Biochemistry.

#### Admission to the Bachelor of Science Degree

Sc2 To be eligible for admission to the degree of Bachelor of Science 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 the regulations that follow and the syllabuses of the degree.

#### Length of Study

Sc3 The curriculum for the degree of Bachelor of Science shall normally require six semesters of full-time study, spread over three academic years, excluding summer semesters. Candidates shall not be permitted to complete the curriculum in more than five academic years, except with the approval of the Faculty Board.

#### Curriculum Requirements

Sc4 To complete the curriculum, candidates shall

- (a) satisfy the requirements prescribed in UG3 of the Regulations for First Degree Curricula;
- (b) take no fewer than 180 credits of different courses, in the manner specified in the syllabuses; and
- (c) follow the required number of core and elective courses as prescribed in the syllabuses, normally equivalent to 60 credits for each year of study. For each semester, candidates shall select, no less than 24, nor more than 36 credits of courses. Should students wish to deviate from the prescribed programme structure or select fewer than 24 or more than 36 credits of courses in a semester, approval must be sought from the Dean via the Head of Department.

#### Selection of Courses

Sc5 Candidates select courses in accordance with these regulations and the guidelines specified in the syllabuses before the beginning of each academic year. Changes to the selection of course(s) may be made only during a period specified by the Faculty, normally in the first two teaching weeks of the semester to which the course begins. Such changes shall not be reflected in the transcripts of candidates. Requests to change after the specified period of a semester shall not be considered, and candidates withdrawing from any course without permission after the specified period of a semester shall be given a failed grade.

<sup>\*</sup> These Regulations apply to students admitted to the first year of study for the Degree of BSc in the academic year 2009-2010 and students admitted directly to the second year in the academic year 2010-2011 only.

#### Assessment

Sc6 Candidates shall have passed a course if the Board of Examiners is satisfied by their performance in the assessment, which may be conducted in any one or any combination of the following manners: written examinations or tests, continuous assessment of performance, laboratory work, field work, research or project reports, or in any other manner as prescribed in the syllabuses. Grades shall be awarded in accordance with UG 5 of the Regulations for New Degree Curricula.

Sc7 Candidates failing to fulfil the laboratory or fieldwork component of a course, if any, may result in failure of the whole course.

Sc8 Candidates who fail a course may retake the course and both grades shall be recorded on the transcript. In the calculation of the semester GPA, all credit-units attempted are counted. In the calculation of the cumulative GPA, only credits-units gained are counted.

Sc9 Candidates shall not be permitted to repeat a course for which they have received a pass grade for upgrading purposes.

#### Unsatisfactory Progress

Sc10 Candidates who have passed less than 36 credits of courses in any academic year or obtained a Semester or Year GPA of 1.2 or below may be required to discontinue their studies in accordance with General Regulation G12.

#### Absence from Examination

Sc11 Failure to take the examination as scheduled, normally results in automatic course failure. Candidates who are unable because of illness to be present at any examination of a course, may apply for permission to present themselves for examination at some other time. Any such application shall be made on the form prescribed within two weeks of the day of the examination.

#### Advanced Standing

Sc12 Advanced credits granted under UG2 of the Regulations for First Degree Curricula shall be recorded on the transcript of candidates but not included in the calculation of the cumulative GPA. Candidates with advanced standing credits shall normally have their degree classification determined separately by the Faculty Board.

#### Degree Classification

Sc13 To be eligible for the award of the degree of Bachelor of Science, candidates shall pass a minimum of 180 credits of courses, including

- (a) 6 credits of courses in English language enhancement;
- (b) 3 credits of course in Chinese language enhancement;
- (c) a 3-credit course from those listed under the Humanities and Social Sciences studies<sup>#</sup>;
- (e) satisfactory completion of IT proficiency requirement, as specified by the Board<sup>®</sup>;
- (f) at least 90 credits of Science courses, of which no less than 60 credits must be gained from advanced courses; and
- (g) all required courses as prescribed in the major and minor curriculum; and Faculty elective courses.

Sc14 The degree of Bachelor of Science 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 Faculty Board and a list of candidates who have successfully completed all the degree requirements shall be posted on Faculty noticeboards.

- <sup>#</sup> Students may take a 6-credit IT-integrated course in Humanities and Social Sciences Studies offered in 2009-2010 or a 6-credit course in the Common Core Curriculum to be offered from 2010-2011 onwards to satisfy this requirement.
- <sup>®</sup> IT proficiency requirement can be satisfied by taking Information technology proficiency test or a 6-credit IT-integrated course in Humanities and Social Science Studies.

# SECTION X

### **Teaching Weeks**

## SCIENCE

Teaching Weeks 2012-2013 for	• Undergraduate and 2	Taught Postgraduate Students
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	SUN	MON	TUE	WED	THUR	FRI	SAT	Week No	
	2	3	4	5	6	7	1 8	1 2	
SEP-12	9 16	10	11	12	13	14	15	3	FIRST SEMESTER: SEP 17, 2012 - JAN 5, 2013
	16 23 20	17 24	18 25	19 26	20 27	21 28	22 29	4 5	First Day of Teaching: Sep 17, 2012
	30	[1]	[2]	3	4	5	6	6	
<b>OCT-12</b>	7 14	8 15	9 16	10 17	11 18	12 19	13 20	7 8	
	21 28	22 29	[23] 30	24 31	25	26	27	9 10 (Reading)	Reading/ Field Trip Week: Oct 29 - Nov 3
	4	5	6	7	1 8	2 9	3 10	11	
NOV-12	4	12	13	14	15	16	10	11	
	18 25	19 26	20 27	21 28	22 29	23 30	24	13 14	
	2	3	4	5	6	7	1 8	15	Last Day of Teaching: Dec 8, 2012
DEC-12	9	10	11	12	13	14	15	16 (Revision)	Revision Period: Dec 10 - 14
DEC-12	16	17	18	19	20	21	22	17	Assessment Period: Dec 15 - Dec 22 *
	23 30	(24) <31>	[25]	[26]	27	28	29	18	(up to Jan 5, 2013, if needed)
	6	7	<u>[1]</u> 8	2 9	3 10	4 11	5 12	19 20 (Break)	
JAN-13	13	14	15	16	17	18	19	21 (Break)	SECOND SEMESTER: JAN 21 - JUN 1, 2013
	20 27	21 28	22 29	23 30	24 31	25	26	22 23	First Day of Teaching: Jan 21, 2013
						1	2		
FEB-13	3 10	4	5 [12]	6 [13]	7 14	8 15	9 16	24 25 (Suspension)	Class Suspension Period for the Lunar New Year: Feb
	17	18	19	20	21	22	23	26	
	24	25	26	27	28	1	2	27	
	3 10	4	5 12	6 13	7 14	8 15	9 (16)	28 29 (Reading)	Reading/ Field Trip Week: Mar 11 - 16
MAR-13	17	18	19	20	21	22	23	30	Reading Field Hip Week Mail II 10
	24 31	25	26	27	28	[29]	[30]	31	
	7	[1] 8	2 9	3 10	[4] 11	5 12	6 13	32 33	
APR-13	14	15	16	17	18	19	20	34	
	21 28	22 29	23 30	24	25	26	27	35 36	
	5	6	7	[1] 8	2 9	3 10	4 11	27 (Povision)	Last Day of Teaching: May 4, 2013 Revision Period: May 6 - 11
MAY-13	12	13	14	8 15	9 16	10 [17]	11	37 (Revision) 38	Assessment Period: May 13 - Jun 1
	19 26	20 27	21 28	22 29	23 30	24 31	25	39 40	
							1		
WD1 12	2 9	3 10	4 11	5 [12]	6 13	7 14	8 15	41 (Break) 42 (Break)	
JUN-13	16	17	18	19	20	21	22	43 (Break)	
	23 30	24	25	26	27	28	29	44 (Break)	OPTIONAL SUMMER SEMESTER: JUL 2 - AUG
		[1]	2	3	4	5	6	45	
JUL-13	7 14	8 15	9 16	10 17	11 18	12 19	13 20	46 47	
	21	22	23	24	25	26	27	48	
	28	29	30	31	1	2	3	49	
AUC 12	4	5 12	6	7 14	8	9	10	50 51	
AUG-13	11 18	12 19	13 20	21	15 22	16 23	17 24	52	
	25	26	27	28	29	30	31	53 (Break)	
[] Genera	l Holiday				Reading/ I	Field Trip V	Veek		
() Univers	sity Holida	ıy (Full Day	/)		Revision I	Period			
<> Unive	rsity Holic	lay (afterno	on only)		Class Susp	pension Per	iod for the	Lunar New Year	
					Assessmen	nt Period			
					A	t Dania J ()	c	х х	

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11	
12	
13	
14	
15	Last Day of Teaching: Dec 8, 2012
Revision)	Revision Period: Dec 10 - 14
17	Assessment Period: Dec 15 - Dec 22 *
18	(up to Jan 5, 2013, if needed)
19	
(Break)	
(Break)	SECOND SEMESTER: JAN 21 - JUN 1, 2013
22	First Day of Teaching: Jan 21, 2013
23	
24	Class Suspension Period for the Lunar New Year: Feb 9 - 15
uspension)	•
26	
27	
28	
0,	Reading/ Field Trip Week: Mar 11 - 16
30	
31	
32	
33	
34 35	
36	
50	Last Day of Teaching: May 4, 2013
Revision)	Revision Period: May 6 - 11
38	Assessment Period: May 13 - Jun 1
39	
40	
(Break)	
(Break)	
(Break)	
(Break)	
	<b>OPTIONAL SUMMER SEMESTER: JUL 2 - AUG 24, 20</b>

TIONAL SUMMER SEMESTER: JUL 2 - AUG 24, 2013

#### Notes:

First Semester: 10 Mondays, 9 Tuesdays, 11 Wednesdays, Thursdays, Fridays and Saturdays Second Semester: 12 Mondays, 13 Tuesdays, 12 Wednesdays, Thursdays, Fridays and Saturdays

\* Depending on the papers to be examined, if possible, assessment period will end on Dec 22, but if necessary, it will extend beyond the Christmas and the New Year Holidays, up to Jan 5

Assessment Period (if necessary)

### Useful contacts and websites

# SCIENCE

Faculty of Science	Tel Fax Email Website ( <i>Please visit <u>htt</u></i>	: : : : : :	G12, Ground Floor, Chong Yuet Ming Physics Building 2859 2683 2858 4620 science@hku.hk http://www.scifac.hku.hk/ www.scifac.hku.hk/ for the latest ses, timetables, notices and forms)
	upuales of boc of	ours	
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/
Mathematics	Website	:	http://www.math.hku.hk/
Physics	Website	:	http://www.physics.hku.hk/
Statistics and Actuarial Science	Website	:	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
<b>Resources for Students</b> (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