

REGULATIONS FOR THE DEGREE OF BACHELOR OF SCIENCE ¹ (BSc)

(See also General Regulations and Regulations for First Degree Curricula)

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 and the Department of Biochemistry.

“Advanced course” means any level 2 and 3 course offered by the Faculty of Science or the Department of Biochemistry.

Admission to Bachelor of Science Degree

Sc2 To be eligible for admission to the degree of Bachelor of Science candidates

- (a) shall comply with the General Regulations;
 - (b) shall comply with the Regulations for First Degree Curricula; and
 - (c) shall satisfy all the requirements of the curriculum in accordance with the regulations that follow and the syllabuses of the degree.
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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

- (a) shall satisfy the requirements prescribed in UG3 of the Regulations for First Degree Curricula;
- (b) shall take no fewer than 180 credits of different courses, in the manner specified in the syllabuses; and
- (c) shall 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.

¹ For students admitted in 2009.

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.

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 studies²;
- (d) satisfactory completion of IT proficiency requirement, as specified by the Board³;
- (e) at least 90 credits of Science courses, of which no less than 60 credits must be gained from advanced courses; and
- (f) 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.

² Students may take the 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.

³ IT proficiency requirement can be satisfied by taking Information Technology proficiency test or the 6-credit IT-integrated course in Humanities and Social Sciences Studies.

SYLLABUSES FOR THE DEGREE OF BACHELOR OF SCIENCE

(Refer to <http://www.hku.hk/science> for updates)

MAJORS AND MINORS OFFERED TO BSC STUDENTS*

The following majors/minors are available for BSc students in 2009-2010.

Science Majors

Astronomy⁷
 Biochemistry
 Biology
 Biotechnology
 Chemistry
 Earth Sciences
 Ecology & Biodiversity
 Environmental Protection⁶
 Environmental Science⁸
 Food & Nutritional Science
 Materials Science⁶
 Mathematics
 Mathematics / Physics
 Microbiology⁵
 Physics
 Risk Management
 Statistics

Arts Majors¹

American Studies
 Chinese History and Culture
 Chinese Language and Literature
 Chinese Studies
 Comparative Literature
 Cross-Cultural Studies in English⁵
 English Studies
 European Studies
 Fine Arts
 French
 Geography²
 German
 History
 Human Language Technology
 Japanese Studies
 Language and Communication
 Linguistics
 Linguistics and Philosophy
 Modern China Studies
 Music
 Philosophy
 Spanish³
 Translation

Science Minors

Actuarial Studies
 Astronomy
 Biochemistry
 Biology
 Biotechnology
 Chemistry
 Earth Sciences
 Ecology & Biodiversity
 Environmental Protection⁶
 Food & Nutritional Science
 General Science (*only available for students outside the Faculty of Science*)
 Global Climate Change⁵
 Mathematics
 Microbiology⁵
 Physics
 Risk Management
 Statistics

Business and Economics Majors¹

Economics
 Finance

Business and Economics Minors

Business
 Economics
 Finance

Education Minors

Applied Child Development
 Education
 Information Management

Engineering Major¹

Computer Science⁷

Engineering Minor

Computer Science

Arts Minors

African Studies
 American Studies
 Arabic
 Chinese History and Culture
 Chinese Language and Literature
 Chinese Studies
 Comparative Literature
 Cross-Cultural Studies in English
 English Studies
 European Studies
 Fine Arts
 French
 Geography ²
 German
 Greek
 History
 Italian
 Japanese Culture
 Japanese Language
 Korea
 Language and Communication
 Linguistics
 Modern China Studies
 Music
 Philosophy
 Portuguese
 Spanish
 Swedish
 Thai
 Translation

Social Sciences Majors ¹

Criminal Justice
 Geography ⁵
 Global Studies
 Media and Cultural Studies
 Politics and Public Administration
 Psychology
 Public and Social Administration ⁶
 Social Work and Social Administration
 Sociology

Social Sciences Minors

Criminal Justice
 Family and Child Studies
 Geography ⁵
 Global Studies
 Human Resource Management
 International Business ⁴
 Journalism and Media Studies
 Media and Cultural Studies
 Politics and Public Administration
 Psychology
 Public and Social Administration ⁶
 Social Work and Social Administration
 Sociology

Human Performance Major ¹

Exercise Science

Human Performance Minor

Exercise Science

¹ non-science major can only be taken by BSc students as 2nd major

² only offered for students admitted in 2006-07 or before

³ only offered for students admitted in 2006-07 or thereafter

⁴ only offered for students admitted in 2007-08 or before

⁵ only offered for students admitted in 2007-08 or thereafter

⁶ only offered for students admitted in 2008-09 or before

⁷ only offered for students admitted in 2008-09 or thereafter

⁸ only offered for students admitted in 2009-10 or thereafter

* *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.*

Note: Details of the courses and majors/minors are provided by the offering Faculty / Department. Please contact the relevant Faculty / Department for further information or updates.

Major in Astronomy ¹ (for students admitted to the first year in 2008 or thereafter)

Objectives : 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 students who would like to acquire a well-rounded foundation on the subject. 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 real-world 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 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)		Credits	
1. Introductory level courses (18 credits)			
Two of the following three courses:			
BIOL0602	Origins of life and astrobiology	3	
PHYS0001	Nature of the universe I: introduction to observational astronomy and the solar system	3	
PHYS0002	Nature of the universe II: stars, galaxies and cosmology for beginners	3	
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 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	
PHYS3035	Stellar atmosphere	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 (PHYS2000 or PHYS3000 or PHYS6000 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
-	PHYS3988	Physics internship	6
-	SCNC2005	Career development for science students	(non-credit bearing)
-	Exchange programme via HKU World Wide Exchange Programme (1 semester or 1 year)		(non-credit bearing)
-	Any other activities determined by the Faculty to conform to the spirit of experiential learning experience		(non-credit bearing)
* If the extra-learning experience is fulfilled by non-credit bearing activities, students must take an additional 6-credit advanced level physics course (PHYS2000 or PHYS3000 or PHYS6000 level)			

Note: 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.

Major in Biochemistry (for students admitted to the first year in 2007 or thereafter)

Objectives : The Major in Biochemistry offered by the Department of 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 CHEM0004#/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)		Credits
1. Introductory level courses (18 credits)		
BIOC1001	Basic biochemistry	6
BIOC1003	Introduction to molecular genetics	6
CHEM1406	Basic organic chemistry	6
	OR CHEM1401 Fundamentals of organic chemistry	6
2. Advanced level courses (48 credits)		
At least 48 credits of the following courses:		
BIOC2601	Metabolism	6
BIOC2603	Principles of molecular genetics	6
BIOC2604	Essential techniques in biochemistry and molecular biology	6
BIOC3608	Introduction to 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)
- Exchange programme via HKU World Wide Exchange Programme (1 semester or 1 year)		(non-credit bearing)
- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience		(non-credit 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 (BIOC2000 or BIOC3000 level)		

Note: # Not available in 2009-2010 or thereafter.

Major in Biology (for students admitted to the first year in 2009 or thereafter)

Objectives : 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)

		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	6
BIOL2215	Animal physiology	6
BIOL2303	Molecular biology	6

Plus 18 credits of BIOL2000 or 3000 level course

Students are recommended to take the following courses:

BIOL2117	Genetics II	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:

- 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)
- Exchange programme via HKU World Wide Exchange Programme (1 semester or 1 year)		(non-credit bearing)
- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience		(non-credit 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 (BIOL2000 or BIOL3000 level)

Major in Biotechnology (for students admitted to the first year in 2009 or thereafter)

Objectives : 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)		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	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	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)
- Exchange programme via HKU World Wide Exchange Programme (1 semester or 1 year)		(non-credit bearing)
- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience		(non-credit 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 (BIOL2000 or BIOL3000 level)		

Major in Chemistry (for students admitted to the first year in 2007 or thereafter)

Objectives : 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 chemistry-related companies or research laboratories.)

Minimum Entry Requirement : AL Chemistry or equivalent or a pass in CHEM0004[#]/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)		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 (CHEM2000 or CHEM3000 level) of which 6 credits must be at CHEM3000 level, subject to prerequisite requirements. 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:		
- CHEM2111	Directed studies in chemistry	6
- CHEM3105	Chemistry project	12
- CHEM3988	Chemistry internship	6
- SCNC2005	Career development for science students	(non-credit bearing)
- Exchange programme via HKU World Wide Exchange Programme (1 semester or 1 year)		(non-credit bearing)
- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience		(non-credit 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 (CHEM2000 or CHEM3000 level)		

Note: [#] Not available in 2009-2010 or thereafter.

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, 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, CHEM3504/CHEM3513.

Major in Earth Sciences (for students admitted to the first year in 2008 or thereafter)

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)		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 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)
- Exchange programme via HKU World Wide Exchange Programme (1 semester or 1 year)		(non-credit bearing)
- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience		(non-credit 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 (EASC2000 or EASC3000 level)		

Note: 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)

Major in Ecology & Biodiversity (for students admitted to the first year in 2009 or thereafter)

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 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. 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 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 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)		Credits
1. Introductory level courses (18 credits)		
BIOL0601	Ecology of Hong Kong	3
BIOL0604	Evolutionary diversity	6
BIOL0605	Ecology field course	3
BIOL0625	Ecology and evolution	6
The following introductory courses are recommended as Faculty 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
BIOL2611	Systematics & phylogenetics	6
BIOL2612	Conservation biology	6
Plus at least 30 credits of the following courses ¹ :		
BIOL2210	Evolution	6
BIOL2606	Environmental microbiology	6
BIOL2607	Fish biology	6
BIOL2610	Biological oceanography	6
BIOL2615	Freshwater ecology	6
BIOL2616	Plant structure and evolution	3
BIOL2617	Coastal 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)
- Exchange programme via HKU World Wide Exchange Programme (1 semester or 1 year)		(non-credit bearing)
- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience.		(non-credit 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 (BIOL2000 or BIOL3000 level)		

- Note: 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, BIOL2617, BIOL2618, BIOL2619.
- (b) For students who are interested in marine biology: BIOL2607, BIOL2610, BIOL2617, BIOL3621.

Major in Environmental Science (for students admitted to the first year in 2009 or thereafter)

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:

- 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)
- 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)
- 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)
- 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

Required courses (78 credits)

1. Introductory level courses (24 credits) ¹

		Credits
ENVS0001	Introduction to environmental science	6
Plus 18 credits of the following courses:		
ENVS1002	Environmental life science	6
CHEM0008	Fundamental chemistry	6
EASC0118	Blue planet	6
PHYS0625	Physics by inquiry	6
	OR BIOL0126 Fundamentals of biology	6
	OR CHEM1009 Basic chemistry	6
	OR PHYS1417 Basic physics	6

2. Advanced level courses (48 credits) ²

Students must take a minimum of 8 courses from at least 3 of the following 4 key areas. The key areas that are suggested in order to help prepare students for potential career pathways. To meet the interdisciplinary objectives of the Environmental Science major and foster the development of transferable skills a maximum of 3 courses can only be credited from any given area. Students can take more than 3 courses from each area only if they have taken more than the minimum 8 courses.

Area 1: Life and Environment

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

BIOL2606	Environmental microbiology	6
BIOL2610	Biological oceanography	6
BIOL2612	Conservation biology	6
BIOL2615	Freshwater ecology	6
BIOL2617	Coastal ecology	6
BIOL2619	Terrestrial ecology	6
BIOL3621	Fisheries and mariculture	6
ENVS2003	Demographic principles in population and evolutionary biology	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
EASC2128	Earth-ocean-atmosphere interactions	6
EASC2129	Physical 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.

BIOL3622	Environmental impact assessment	6
EASC2130	Earth observation and remote sensing	6
ENVS2004	Environment and society	6
ENVS2005	Environmental policies and planning	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 the following compulsory course to fulfill the experiential learning requirement:

ENVS3016	Environmental science in practice	6
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Other experiential learning courses/activities are also available as electives:

- ENVS2011	Directed studies in environmental science	6
- ENVS3015	Environmental science project	12
- ENVS3988	Environmental science internship	6
- SCNC2005	Career development for science students	(non-credit bearing)
- Exchange programme via HKU World Wide Exchange Programme (1 semester or 1 year)		(non-credit bearing)
- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience		(non-credit bearing)

Note: ¹ Students taking these introductory level courses would have satisfied Block B – The Physical World, and Block C – Life & Living.

² Availability of the advanced level courses is subject to change.

Major in Food & Nutritional Science (for students admitted to the first year in 2009 or thereafter)

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 detailed critical knowledge and understanding of the theoretical and practical aspects of food science and technology and nutrition and their relationship to human health.
- A critical knowledge and understanding on the relationship between food safety and a wide range of social, legal, technological and environmental factors.
- 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 education 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)** **Credits**

BIOL1125	Introduction to biochemistry	OR	CHEM1406	Basic organic chemistry	6
	OR	CHEM1401	Fundamentals of organic chemistry		
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	3
BIOL1122	Functional biology	6

(these courses are also strongly recommended as electives)

2. Advanced level courses (48 credits)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	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	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
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)
- Exchange programme via HKU World Wide Exchange Programme (1 semester or 1 year)		(non-credit bearing)
- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience		(non-credit 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 (BIOL2000 or BIOL3000 level)

Note: ¹ Students who wish to specialize in a certain area are recommended to choose courses from the following lists:

- Food Science and Technology: BIOL2302, BIOL2503, BIOL2507, BIOL2515, BIOL2535, BIOL2536, BIOL3527, BIOL3538, BIOL3539.
- Nutrition and Health Science: BIOL2218, BIOL2529, BIOL2530, BIOL2531, BIOL2532, BIOL2533, BIOL2534, BIOL2536, BIOL2537, BIOL3540, PBSL2229.
- Food Safety and Toxicology: BIOL2218, BIOL2515, BIOL2529, BIOL2536, BIOL3527, BIOL3539.

Major in Mathematics (for students admitted to the first year in 2007 or thereafter)

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[#] : 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)		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 ¹ :		
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 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 ²	6
- MATH2999	Directed studies in mathematics	6
- MATH3988	Mathematics internship	6
- MATH3999	Mathematics project	12
- SCNC2005	Career development for science students	(non-credit bearing)
- Exchange programme via HKU World Wide Exchange Programme (1 semester or 1 year)		(non-credit bearing)
- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience		(non-credit 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 level)		

Note: # Students with different mathematics background must consult the Department of Mathematics for advice on the bridging courses.

- 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 pure mathematics: MATH2303, MATH2304, MATH2402, MATH2403, MATH3302, MATH3310, MATH3404, MATH3501, MATH3502.
- (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.

² MATH2002 is for first year BSc students only.

Major in Mathematics/Physics¹

(for students admitted to the first year in 2008 or thereafter)

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 emphasizes 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)
- f. Students should be able to apply scientific and quantitative methods in tackling problems in research or real-world setting.
(By means of projects, directed studies, local and foreign internships attached to universities, research centers, government bodies, NGOs and influential companies.)

Minimum Entry Requirement[#] :

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 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)		Credits
1. Introductory level courses (24 credits)²		
MATH1111	Linear algebra	6
MATH1211	Multivariable calculus	6
PHYS1414	General physics I	6
PHYS1415	General physics II	6
2. Advanced level courses (48 credits)³		
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 ⁴	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 ⁵	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
- PHYS3988	Physics internship	6
- SCNC2005	Career development for science students	(non-credit bearing)
- Exchange programme via HKU World Wide Exchange Programme (1 semester or 1 year)		(non-credit bearing)
- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience		(non-credit 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 PHYS2533 or PHYS3531 or PHYS3000 or PHYS6000 level)		

Note: # Students with different mathematics background must consult the Department of Mathematics for advice on the bridging courses.

¹ Students would have already satisfied requirements from Blocks A and B with this curriculum.

² Students are recommended to take also MATH1001.

³ Students who intend to pursue further studies in Mathematics/Physics are recommended to take also MATH2401, MATH3501, PHYS3331, and PHYS3332.

⁴ Students may consider taking PHYS2627 as early as possible to allow for maximum flexibility in course selection for advanced level courses.

⁵ MATH2002 is for first year BSc students only.

Major in Microbiology (for students admitted to the first year in 2009 or thereafter)

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 from 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)

				Credits
1. Introductory level courses (18 credits)				
BIOL0129	Introductory microbiology			3
BIOL0131	Basic medical microbiology			3
BIOL1125	Introduction to biochemistry	OR	BIOC1001	6
BIOL1133	Biological science laboratory course		Basic biochemistry	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)
-	Exchange programme via HKU World Wide Exchange Programme (1 semester or 1 year)			(non-credit bearing)
-	Any other activities determined by the Faculty to conform to the spirit of experiential learning experience			(non-credit 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 (BIOL2000 or BIOL3000 level)

Major in Physics (for students admitted to the first year in 2008 or thereafter)

Objectives : 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 real-world 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 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)		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 (PHYS0000 or PHYS1000 level), subject to prerequisite requirements.		
2. Advanced level courses (48 credits)¹			
PHYS2627	Introductory quantum physics 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 (PHYS2000 or PHYS3000 or PHYS6000 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
-	PHYS3988	Physics internship	6
-	SCNC2005	Career development for science students	(non-credit bearing)
-	Exchange programme via HKU World Wide Exchange Programme (1 semester or 1 year)		(non-credit bearing)
-	Any other activities determined by the Faculty to conform to the spirit of experiential learning experience		(non-credit 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 (PHYS2000 or PHYS3000 or PHYS6000 level)			

Note: ¹ Students who intend to pursue further studies in Physics are recommended to take also PHYS3331 and HYS3332

² Students may consider taking PHYS2627 as early as possible to allow for maximum flexibility in course selection for advanced level courses.

Major in Risk Management (for students admitted to the first year in 2009 or thereafter)

Objectives : The Risk Management curriculum at the University of Hong Kong aims to provide students with the skills and expertise to enable them to competently and confidently undertake risk management using an integrated approach. 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)** **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
STAT2320	Risk management and Basel II in banking and finance	6
STAT3301	Time-series analysis	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	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
- SCNC2005	Career development for science students	(non-credit bearing)
- Exchange programme via HKU World Wide Exchange Programme (1 semester or 1 year)		(non-credit bearing)
- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience		(non-credit 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 (STAT2000 or STAT3000 level)

Major in Statistics (for students admitted to the first year in 2009 or thereafter)

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)** **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	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	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
- SCNC2005	Career development for science students	(non-credit bearing)
- Exchange programme via HKU World Wide Exchange Programme (1 semester or 1 year)		(non-credit bearing)
- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience		(non-credit 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 (STAT2000 or STAT3000 level)

Minor in Actuarial Studies

(for students admitted to the first year in 2009 or thereafter)

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

<u>Required courses (36 or 42 credits)</u>		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-economics 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 from 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

Minor in Astronomy (for students admitted to the first year in 2008 or thereafter)

Objectives : The Minor in Astronomy is intended to provide interested students a fundamental outlook on the subject. Students would acquire a taste of the subject through a large selection of elective courses to allow them to pursue their interest in the subject and to establish connections between the field of astronomy and other science disciplines.

Learning Outcomes:

- Students should be able to identify and describe astrophysical phenomena with fundamental knowledge in physics.
(By means of coursework and tutorial classes in the curriculum)
- 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 opportunities of field activities in the curriculum)
- 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)

Minimum Entry Requirement : Nil ¹

Minimum Credit Requirement : 36 credits (12 credits introductory level & 24 credits advanced level courses)

Impermissible Combination : Major in Astronomy ²

* Refer to the Physics Department website <http://www.physics.hku.hk> for suggested curriculum.

Required courses (36 credits)		Credits
1. Introductory level courses (12 credits)		
PHYS0001	Nature of the universe I: introduction to observational astronomy and the solar system	3
PHYS0002	Nature of the universe II: stars, galaxies and cosmology for beginners	3
Plus at least 6 credits of introductory level Physics course (PHYS0000 or PHYS1000 level) ³		
2. Advanced level courses (24 credits)		
At least 24 credits of advanced level Physics courses (PHYS2000 or PHYS3000 or PHYS6000) level, out of which at least 12 credits are of the following courses:		
PHYS2021	The physical universe	6
PHYS2022	Observational astronomy	6
PHYS3031	Astrophysics	6
PHYS3033	General relativity	6
PHYS3034	Cosmology	6
PHYS3040	Stellar physics	6

Note: ¹ 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.

² 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.

³ Students are advised to take at least one of the following courses: PHYS1417, PHYS1414, or PHYS1415 to allow for maximum flexibility in selection for advanced level Physics courses.

Minor in Biochemistry (for students admitted to the first year in 2007 or thereafter)

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 select courses that will compliment the individual student's Major.

Learning Outcomes:

- 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)
- 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)
- 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 CHEM0004[#]/CHEM0008 Fundamental chemistry or equivalent

Minimum Credit Requirement : 36 credits (12 credits introductory level & 24 credits advanced level courses)

Impermissible Combination : Major in Biochemistry

<u>Required courses (36 credits)</u>		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 BIOC2000 level courses and at least 12 credits of BIOC3000 level courses, subject to prerequisite requirements.	

Note: [#] Not available in 2009-2010 or thereafter.

Minor in Biology (for students admitted to the first year in 2009 or thereafter)

Objectives : The aim of this minor 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.

Learning Outcomes:

- 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)
- 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)
- 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)
- 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)		Credits
1. Introductory level courses (12 credits)		
At least 12 credits of the following courses:		
BIOL1122	Functional biology	6
BIOL0604	Evolutionary diversity	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 (BIOL2000 and BIOL3000 level)		
Students are recommended to take the following courses:		
BIOL2112	Plant physiology	6
BIOL2115	Cell biology & cell technology	6
BIOL2116	Genetics I	6
BIOL2117	Genetics II	6
BIOL2207	Endocrinology: human physiology II	6
BIOL2210	Evolution	6
BIOL2215	Animal physiology	6
BIOL2611	Systematics & phylogenetics	6

Minor in Biotechnology (for students admitted to the first year in 2009 or thereafter)

Objectives : The Biotechnology Minor is aimed to provide students a fundamental understanding of biotechnology which is relevant to many business sections and our daily life. Students will learn the scientific principles underlying current biotechnological advances and will become literate in biotechnology business and advancements.

Learning Outcomes:

- a. Develop and apply basic technical and knowledge-based skills in biotechnology.
(by means of coursework and laboratory-based learning in the curriculum)
- b. Develop and apply skills of critical inquiry, teamwork, and effective communication.
(by means of group projects, tutorial classes and presentation opportunities in the curriculum)
- c. Understand and describe the issues and concerns fundamental to the field.
(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 Biotechnology

<u>Required courses (36 credits)</u>		Credits
1. Introductory level courses (12 credits)		
At least 12 credits of the following courses:		
BIOL1122	Functional biology	6
BIOL1125	Introduction to biochemistry	6
BIOL1133	Biological sciences laboratory course	6
2. Advanced level courses (24 credits)		
BIOL2303	Molecular biology	6
<u>Plus</u> at least 18 credits of the following courses:		
BIOL2111	Molecular microbiology	6
BIOL2116	Genetics I	6
BIOL2203	Reproduction & reproductive biotechnology	6
BIOL2205	Basic immunology	6
BIOL2302	Fermentation technology	6
BIOL2515	Food microbiology	6
BIOL2530	Molecular biology and nutrigenomics	6
BIOL3214	General virology	6
BIOL3219	Clinical microbiology and applied immunology	6
BIOL3307	Biotechnology industry	6
BIOL3315	Animal biotechnology	6
BIOL3316	Plant biotechnology	6
BIOL3317	Microbial biotechnology	6

Minor in Chemistry (for students admitted to the first year in 2009 or thereafter)

Objectives : The Chemistry minor is aimed to provide students who are interested in chemistry with an introduction to the fundamental concepts of chemistry. The minor curriculum is designed to provide students from different science majors with a high degree of flexibility of selecting courses to enhance their knowledge and interest in chemistry.

Learning Outcomes:

- to understand and apply the basic concepts of chemistry;
(by means of coursework and laboratory-based learning in the curriculum)
- to apply chemistry concepts in other subjects;
(by means of coursework and laboratory-based learning in the curriculum)
- to transfer the basic concepts to complement their major of study.
(by means of coursework and laboratory-based learning in the curriculum)

Minimum Entry Requirement : AL 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 Chemistry

Required courses (36 credits)		Credits
1. Introductory level courses (12 credits)		
12 credits of the following courses:		
CHEM1002	Chemistry: principles and concepts ¹	6
CHEM1003	Chemistry: the molecular world	6
CHEM1009	Basic chemistry ¹	6
CHEM1406	Basic organic chemistry OR CHEM1401	6
	Fundamentals of organic chemistry	6
2. Advanced level courses (24 credits)		
Any	24 credits of advanced level Chemistry courses (CHEM2000 or CHEM3000 level), subject to prerequisite requirements.	

Note: ¹ CHEM1002 and CHEM1009 are mutually exclusive.

Minor in Earth Sciences

(for students admitted to the first year in 2008 or thereafter)

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)		Credits
1.	Introductory level courses (12 credits)	
<u>Any</u>	two of the following three courses:	
EASC0105	Earth through time	6
EASC0118	Blue planet	6
EASC0116	Introduction to physical geology	6
2.	Advanced level courses (24 credits)	
<u>Any</u>	24 credits of advanced level Earth Sciences courses (EASC2000 or EASC3000 level), subject to prerequisite requirements.	

Minor in Ecology & Biodiversity (for students admitted to the first year in 2009 or thereafter)

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:

- 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)
- understand and describe the impacts of environmental change and the causes and consequences of biodiversity loss;
(by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- appreciate and describe the ecological principles underlying different policies and plans for 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

<u>Required courses (36 credits)</u>		Credits
1. Introductory level courses (12 credits)		
At least 12 credits of the following courses:		
BIOL0601	Ecology of Hong Kong	3
BIOL0604	Evolutionary diversity	6
BIOL0605	Ecology field course	3
BIOL0625	Ecology and evolution	6
2. Advanced level courses (24 credits)		
<u>Plus</u> at least 24 credits of the following courses:		
BIOL2606	Environmental microbiology	6
BIOL2607	Fish biology	6
BIOL2608	Biometrics	6
BIOL2610	Biological oceanography	6
BIOL2611	Systematics & phylogenetics	6
BIOL2612	Conservation biology	6
BIOL2615	Freshwater ecology	6
BIOL2616	Plant structure and evolution	3
BIOL2617	Coastal ecology	6
BIOL2619	Terrestrial ecology	6

Minor in Food & Nutritional Science (for students admitted to the first year in 2009 or thereafter)

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

<u>Required courses (36 credits)</u>		Credits
1. Introductory level courses (12 credits)		
BIOL1514	Nutrition and metabolism	6
BIOL1528	Food chemistry	6
The following course is strongly recommended as Faculty elective:		
BIOL0002	Introduction to food and nutritional science	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	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
BIOL3527	Food safety and quality management	6
BIOL3538	Food product development	6
BIOL3540	Diet, brain function and behaviour	6

Minor in General Science **(for students admitted to the first year in 2007 or thereafter)**

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.

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.

Minor in Global Climate Change

(for students admitted to the first year in 2009 or thereafter)

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, its 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:

- 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)
- to describe and interpret the evolution of Earth's climate system
(by means of coursework, tutorial and laboratory-based learning in the curriculum)
- 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)
- 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 : Nil¹

Required courses (36 credits)		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)		
At least 24 credits of advanced level Earth Sciences courses (EASC2000 or EASC3000)including:		
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 biology	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
PHYS2624	Introductory atmospheric physics	6

Note: 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.

Minor in Mathematics (for students admitted to the first year in 2007 or thereafter)

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

Learning Outcomes:

- a. to be able to understand and describe fundamental concepts of mathematics
(by means of coursework, tutorial classes and project-based learning in the curriculum)
- b. to be able to apply mathematical methods and analysis to real life problems
(by means of coursework, tutorial classes and project-based learning in the curriculum)
- c. to be able to communicate and discuss scientific issues related to mathematics
(by means of coursework, tutorial classes and presentation opportunities in the curriculum)

Minimum Entry Requirement[#] : 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 : 36 credits (12 credits introductory level & 24 credits advanced level courses)

Impermissible Combination : Major in Mathematics
Major in Mathematics/Physics

<u>Required courses (36 credits)</u>		Credits
1.	Introductory level courses (12 credits)¹	
MATH1111	Linear algebra	6
<u>Plus</u>	one of the following courses:	
MATH1211	Multivariable calculus	6
MATH1805	University mathematics B	6
MATH1813	Mathematical methods for actuarial science	6
2.	Advanced level courses (24 credits)	
<u>Any</u>	24 credits of advanced level Mathematics courses (MATH2XXX or MATH3XXX level), subject to prerequisite requirements.	

Note: [#] Students with different mathematics background must consult the Department of Mathematics for advice on the bridging courses.

¹ Students are strongly advised to take also MATH1001.

Minor in Microbiology (for students admitted to the first year in 2009 or thereafter)

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 from 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 in.

Learning Outcomes:

- 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)
- 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)
- 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)
- 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)				Credits	
1. Introductory level courses (12 credits)					
12 credits of the following courses:					
BIOL0129	Introductory microbiology			3	
BIOL0131	Basic medical microbiology			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	

Minor in Physics (for students admitted to the first year in 2008 or thereafter)

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

Learning Outcomes:

- Students should be able to identify and describe physical systems with fundamental knowledge in physics.
(By means of coursework and tutorial classes in the curriculum)
- Students should be able to analyze some physics problems qualitatively and quantitatively.
(By means of coursework, tutorial classes and laboratory works in the curriculum)
- 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)

Minimum Entry Requirement : AL / AS Physics or AL Engineering Science; or a pass in PHYS0114 Fundamental physics I and PHYS0115 Fundamental physics II

Minimum Credit Requirement : 36 credits (12 credits introductory level & 24 credits advanced level courses)

Impermissible Combination : Major in Mathematics/Physics
Physics

* Refer to the Physics Department website <http://www.physics.hku.hk> for suggested curriculum.

Required courses (36 credits)		Credits
1. Introductory level courses (12 credits)		
PHYS1417	Basic Physics	6
Plus	at least 6 credits of introductory level Physics course (PHYS0000 or PHYS1000 level) ¹	
Or		
PHYS1414	General physics I	6
PHYS1415	General physics II	6
2. Advanced level courses (24 credits)		
Any	24 credits of advanced level Physics courses (PHYS2000 or PHYS3000 or PHYS6000 level), subject to prerequisite requirements.	

Note: 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.

Minor in Risk Management (for students admitted to the first year in 2009 or thereafter)

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:

- 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)
- 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)
- 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;
Statistics
Minor in Statistics

<u>Required courses (36 credits)</u>		Credits
1. Introductory level courses (12 credits)		
STAT1301	Probability and statistics I	6
<u>Or</u>		
STAT1306	Introductory statistics	6
<u>Or</u>		
STAT0302	Business statistics	6
<u>Plus</u>		
STAT1302	Probability and statistics II	6
<u>Or</u>		
STAT1303	Data management	6
<u>Or</u>		
	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
STAT2320	Risk management and Basel II in banking and finance	6
STAT2812	Financial economics I	6
STAT3301	Time-series analysis	6
STAT3308	Financial engineering	6
STAT3321	Credit risk analysis	6
STAT3322	Market risk analysis	6
STAT3821	Financial economics II	6

Minor in Statistics (for students admitted to the first year in 2009 or thereafter)

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 Risk Management;
Statistics
Minor in Risk Management

Required courses (36 credits)		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
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
STAT2309	The statistics of investment risk	6
STAT2310	Risk management and insurance	6
STAT2311	Computer-aided data analysis	6
STAT2312	Data mining	6
STAT2313	Marketing engineering	6
STAT2314	Business forecasting	6
STAT2315	Practical mathematics for investment	6
STAT2320	Risk management and Basel II in banking and finance	6
STAT2812	Financial economics I	6
STAT3301	Time-series analysis	6
STAT3302	Multivariate data analysis	6
STAT3304	Computer-aided statistical modelling	6
STAT3306	Selected topics in statistics	6
STAT3308	Financial engineering	6
STAT3316	Advanced probability	6
STAT3317	Computational statistics	6
STAT3322	Market risk analysis	6
STAT3811	Survival analysis	6
STAT3821	Financial economics II	6

Note: The following combinations of courses are recommended for students interested in more focused areas:

- ¹ Statistical theory and research methodology: STAT1301, STAT1302, STAT2301, STAT2302, STAT2303, STAT3316, STAT3301, STAT3302.
- ² Finance and investment: STAT1303, STAT2301, STAT2309, STAT2310, STAT2311, STAT2314, STAT2315, STAT2320, STAT2806/STAT2812, STAT3301, STAT3305/STAT3322, STAT3308, STAT3812/STAT3821.
- ³ Business and management: STAT1303, STAT1304, STAT2301, STAT2305, STAT2306, STAT2311, STAT2312, STAT2313, STAT2314, STAT3302.
- ⁴ Biological sciences: STAT1303, STAT2301, STAT2303, STAT2304, STAT2307, STAT2308, STAT2311, STAT3811.
- ⁵ Information technology: STAT1303, STAT2311, STAT2312, STAT3317, STAT3304, STAT3305/STAT3322.

Candidates admitted to this programme could refer to p.1296 to p.1673 for courses offered by other Faculties and Centres.