

REGULATIONS FOR THE DEGREE OF BACHELOR OF SCIENCE (BSc)

These regulations apply to students admitted to the BSc degree curriculum in the academic year 2010-2011 and thereafter.

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

Definitions

Sc1¹ For the purpose of these regulations and the syllabuses for the BSc degree, unless the context otherwise requires:

“Science course” means any course offered by the Faculty of Science, and the Department of Biochemistry.

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

“Course” means a course of study, with a credit value expressed as a number of credit-units as specified in the syllabuses for a degree curriculum.

“Syllabus” means courses taught by departments, centres, and schools, offered under a degree curriculum.

“Credits” or “credit-units” means the value assigned to each course to indicate its study load relative to the total study load under a degree curriculum. The study load refers to the hours of student learning activities and experiences, both within and outside the classroom, and includes contact hours and time spent on assessment tasks and examinations. Candidates who satisfactorily complete courses with a credit value earn the credits assigned to these courses.

Admission to the BSc degree

Sc2 To be eligible for admission to the BSc degree, candidates shall:

- (a) comply with the General Regulations;
 - (b) comply with the Regulations for First Degree Curricula; and
 - (c) satisfy all the requirements of the curriculum in accordance with these regulations and the syllabuses.
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Period of study

Sc3 The curriculum for the BSc degree shall normally require six semesters of full-time study, extending over not fewer than three academic years, and shall include any assessment to be held during and/or at the end of each semester. Candidates shall not in any case be permitted to extend their studies beyond the maximum period of registration of five academic years.

¹ This regulation should be read in conjunction with UG1 of the Regulations for First Degree Curricula.

Selection of courses

Sc4 Candidates shall select their courses in accordance with these regulations and the guidelines specified in the syllabuses before the beginning of each semester. Any change to the selection of courses shall be made only during the add/drop period of the semester in which the course begins, and such changes shall not be reflected in the transcript of the candidate. Requests for changes after the designated add/drop period of the semester shall not be considered.

Curriculum requirements and progression in curriculum

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- (a) Candidates shall satisfy the requirements prescribed in UG5 of the Regulations of First Degree Curricula.
 - (b) Candidates shall take not fewer than 180 credits, in the manner specified in these regulations and the syllabuses.
 - (c) Candidates shall take at least 90 credits of Science courses, of which no fewer than 60 credits must be gained from advanced Science courses, including all required courses of the major programme of the BSc degree curriculum, and the Faculty elective courses.
 - (d) Candidates shall normally be required to take not fewer than 24 credits nor more than 30 credits in any one semester (except the summer semester) unless otherwise permitted or required by the Board of the Faculty, or except in the last semester of study when the number of outstanding credits required to complete the curriculum requirements may be fewer than 24 credits.
 - (e) Candidates may, of their own volition, take additional credits not exceeding 6 credits in each semester, and/or further credits during the summer semester, accumulating up to a maximum of 72 credits in one academic year. With the special permission of the Board of the Faculty, candidates may exceed the annual study load of 72 credits in a given academic year provided that the total number of credits taken does not exceed the maximum curriculum study load of 216 credits for the normative period of study specified in the curriculum regulations, save as provided for under Sc5(f).
 - (f) Where candidates are required to make up for failed credits, the Board of the Faculty may give permission for candidates to exceed the annual study load of 72 credits provided that the total number of credits taken does not exceed the maximum curriculum study load of 360 credits for the maximum period of registration specified in the curriculum regulations.
 - (g) Candidates may, with the approval of the Board of the Faculty, transfer credits for courses completed at other institutions at any time during their candidature. The number of transferred credits will be recorded on the transcript of the candidate, but the results of courses completed at other institutions shall not be included in the calculation of the GPA. The number of credits to be transferred shall not exceed half of the total credits normally required under the degree curricula of the candidates during their candidature at the University.
 - (h) Candidates shall be required to discontinue their studies if they have:
 - (i) failed to complete successfully 36 or more credits in two consecutive semesters (not including the summer semester), except where they are not required to take such a number of credits in the two given semesters, or
 - (ii) failed to achieve an average Semester GPA of 1.0 or higher for two consecutive semesters, or
 - (iii) exceeded the maximum period of registration specified in Sc3, unless otherwise permitted by the Board of the Faculty.
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Advanced standing

Sc6 Advanced standing may be granted to candidates in recognition of studies completed successfully in an approved institution of higher education elsewhere in accordance with UG2 of the Regulations for First Degree Curricula. Credits granted for advanced standing will be recorded on the transcript of the candidate but shall not be included in the calculation of the GPA.

Assessment

Sc7

- (a) Candidates shall be assessed for each of the courses for which they have registered, and assessment may be conducted in any combination of continuous assessment of coursework, written examinations and/or any other assessable activities. Only satisfactorily completed courses will earn credits.
 - (b) Candidates who are unable, because of illness, to be present at the written examination of any course may apply for permission to present themselves at a supplementary examination of the same course to be held before the beginning of the First Semester of the following academic year. Any such application shall be made on the form prescribed within two weeks of the first day of the candidate's absence from any examination. Any supplementary examination shall be part of that academic year's examinations, and the provisions made in the regulations for failure at the first attempt shall apply accordingly.
 - (c) Candidates shall not be permitted to repeat a course for which they have received a D grade or above for the purpose of upgrading.
 - (d) Candidates are required to make up for failed courses in the following manner: repeating the failed course by undergoing instruction and satisfying the assessment, or for elective courses, taking another course in lieu and satisfying the assessment requirements.
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Degree classification

Sc8 To be eligible for the award of the BSc degree, candidates shall have:

- (a) satisfied the requirements in UG5 of the Regulations for First Degree Curricula;
 - (b) passed not fewer than 180 credits, comprising
 - (i) at least 90 credits of Science courses, of which no fewer than 60 credits must be gained from advanced Science courses; and
 - (ii) all required courses as prescribed in the major programme of the BSc degree curriculum; and the Faculty elective courses.
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Sc9 The degree of Bachelor of Science shall be awarded in five divisions: First Class Honours, Second Class Honours Division One, Second Class Honours Division Two, Third Class Honours, and Pass. A list of candidates who have successfully completed all the degree requirements shall be posted on Faculty notice boards.

SYLLABUSES FOR THE DEGREE OF BACHELOR OF SCIENCE

(Refer to <http://web.science.hku.hk:8080/sr/servlet/enquiry> for the curriculum structure of the Science majors and minors)

MAJORS AND MINORS OFFERED TO BSC STUDENTS*

(1) The following majors/minors¹ are available for BSc students admitted in 2009 or before.

Science Majors

Astronomy⁵
 Biochemistry
 Biology
 Biotechnology
 Chemistry
 Earth Sciences
 Ecology and Biodiversity
 Environmental Protection⁴
 Environmental Science⁷
 Food and Nutritional Science
 Materials Science⁴
of Science)
 Mathematics
 Mathematics / Physics
 Microbiology³
 Physics
 Risk Management
 Statistics

Arts Majors¹

American Studies
 Chinese History and Culture
 Chinese Language and Literature
 Chinese Studies
 Comparative Literature
 Cross-Cultural Studies in English³
 English Studies
 European Studies
 Fine Arts
 French
 General Linguistics⁸
 German
 History
 Human Language Technology
 Japanese Studies
 Language and Communication
 Linguistics⁶
 Linguistics and Philosophy⁶
 Modern China Studies
 Music
 Philosophy
 Spanish
 Translation

Science Minors

Actuarial Studies
 Astronomy
 Biochemistry
 Biology
 Biotechnology
 Chemistry
 Earth Sciences
 Ecology and Biodiversity
 Environmental Protection⁴
 Food and Nutritional Science
 General Science (*only available for students outside the Faculty of Science*)
 Global Climate Change³
 Mathematics
 Microbiology³
 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 Science⁵

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
 General Linguistics⁸
 German
 Greek
 History
 Italian
 Japanese Culture
 Japanese Language
 Korea
 Language and Communication
 Linguistics⁶
 Modern China Studies
 Music
 Philosophy
 Portuguese
 Spanish
 Swedish
 Thai
 Translation

Human Performance Major¹

Exercise Science

Human Performance Minor

Exercise Science

Social Sciences Majors¹

Criminal Justice⁶
 Cognitive Science⁸
 Counselling⁸
 Criminology⁸
 Culture, Heritage and Tourism⁸
 Geography³
 Global Studies
 Media and Cultural Studies
 Politics and Public Administration
 Psychology
 Public and Social Administration⁴
 Social Policy and Community Building⁸
 Social Work and Social Administration
 Sociology
 Urban Governance⁸

Social Sciences Minors

Criminal Justice
 Cognitive Science⁸
 Counselling⁸
 Criminology⁸
 Culture, Heritage and Tourism⁸
 Family and Child Studies
 Geography³
 Global Studies
 Human Resource Management
 International Business²
 Journalism and Media Studies
 Media and Cultural Studies
 Politics and Public Administration
 Psychology
 Public and Social Administration⁴
 Social Policy and Community Building⁸
 Social Work and Social Administration
 Sociology
 Urban Governance⁸

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

² only offered for students admitted in 2007-08 or before

³ only offered for students admitted in 2007-08 or thereafter

⁴ only offered for students admitted in 2008-09 or before

⁵ only offered for students admitted in 2008-09 or thereafter

⁶ only offered for students admitted in 2009-10 or before

⁷ only offered for students admitted in 2009-10 or thereafter

⁸ only offered for students admitted in 2010-11 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 non-Science courses and majors/minors are provided by the offering Faculty / Department. Please contact the relevant Faculty / Department for further information or updates.

- (2) **List of Majors and Minors offered by other Faculties to BSc students admitted in 2010-2011 is available at <http://web.science.hku.hk:8080/sr/servlet/enquiry>**
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Major in Astronomy (Offered to students admitted to Year 1 in 2010-2011)

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 the students who would like to acquire a solid foundation on the subject. A large selection of elective courses is provided for students to pursue their interest specialization in the subject, including observational astronomy, planetary science, stellar physics, and interstellar medium. Students would attain professional knowledge in astronomy, research experience and the training of analytical thinking and quantitative reasoning during their studies. In addition to preparing students for postgraduate studies as professional astronomers, astronomy training can also lead to local careers in museums, weather services, and the education sectors. Beyond Hong Kong, astronomy graduates have challenging careers in aerospace, communications, energy, and computer industries, as well as in astronomical observatories and space research centers.

Learning Outcomes:

- a. Students should be able to identify and describe astrophysical phenomena with their professional knowledge.
(by means of coursework and tutorial classes in the curriculum)
- b. Students should have developed their scientific intuition, abilities and techniques to tackle astrophysical problems either theoretical or observational in nature.
(by means of coursework, tutorial classes, and frequent opportunities in field activities in the curriculum)
- c. Students should be able to analyze astrophysical problems qualitatively and quantitatively.
(by means of coursework, tutorial classes and research-based projects in the curriculum)
- d. Students should be able to communicate and collaborate with people effectively in scientific issues.
(by means of group projects, tutorial sessions and presentation opportunities in the curriculum)
- e. Students should be able to apply scientific and quantitative methods in tackling problems in research or 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 PHYS0625 Physics by inquiry or equivalent

Minimum Credit Requirement: 72 credits (18 credits introductory level, 54 credits advanced level courses including experiential learning requirement)

Impermissible Combination: Minor in Astronomy

Required courses (72 credits) (note 1)

1. Introductory level courses (18 credits)

EASC1123 Planetary geology (6 credits)

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

PHYS0002 Nature of the universe II: stars, galaxies and cosmology for beginners (3 credits)

Plus at least 6 credits of the following courses:

- PHYS1414 General physics I (6 credits)
- PHYS1415 General physics II (6 credits)
- PHYS1417 Basic physics (6 credits)

2. Advanced level courses (48 credits)

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

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

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

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

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

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

3. Experiential learning requirement (6 credits) *

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

- PHYS2533 Directed studies in physics (6 credits)
- PHYS3531 Physics project (12 credits)
- PHYS3987 Quantitative tools in physics (non-credit bearing)
- PHYS3988 Physics internship (6 credits)
- SCNC2005 Career development for science students (non-credit bearing)
- SCNC2988 Service learning internship (non-credit bearing)
- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)
- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (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 (PHYS2XXX or PHYS3XXX or PHYS6XXX level).

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

Notes:

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

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

Objectives:

The Major in Biochemistry aims to provide students with both basic and advanced knowledge in contemporary biochemistry and molecular biology. Core courses in the curriculum emphasize equipping students with a general understanding of the fundamental ideas, principles and theories of biochemistry with particular focus on the relevance of biochemistry, molecular biology and genomics to biology, human health and disease. Elective courses extend this core knowledge to provide students with specialized insight into both basic and applied scientific endeavour in biochemistry, bioinformatics, molecular biology and molecular genetics. Throughout the curriculum there is 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 analyzes; and to design experiments that bring discovery and insight into the unknown.
(by means of laboratory-based and research project-based learning)
- c. Students would be able to interpret and communicate scientific data and literature using appropriate scientific language.
(by means of literature-based coursework and debate)
- d. Students would be able to work effectively as a team and synergize with their colleagues in a supportive manner.
(by means of group-based learning and by group-based problem solving)
- e. Students would be able to recognize the interconnections of biochemistry with other disciplines in science, medicine and engineering, humanities and ethics, which are relevant for diverse working environment in the society
(by means of multidisciplinary-based research projects, internship and debate)

Minimum Entry Requirement: AL Chemistry or a pass in CHEM0008 Fundamental chemistry or equivalent

Minimum Credit Requirement: 72 credits (18 credits introductory level, 54 credits advanced level courses including experiential learning requirement)

Impermissible Combination: Minor in Biochemistry

Required courses (72 credits)**1. Introductory level courses (18 credits)**

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

2. Advanced level courses (48 credits)

At least 48 credits of the following courses:

- BIOC2601 Metabolism (6 credits)
 BIOC2603 Principles of molecular genetics (6 credits)
 BIOC2604 Essential techniques in biochemistry and molecular biology (6 credits)
 BIOC3608 Introduction to bioinformatics (6 credits)
 BIOC3610 Advanced biochemistry I (6 credits)
 BIOC3611 Advanced biochemistry II (6 credits)
 BIOC3613 Molecular biology of the gene (6 credits)
 BIOC3615 Advanced techniques in biochemistry and molecular biology (6 credits)
 BIOL2301 Protein structure and function (6 credits)

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 credits)
- BIOC3614 Biochemistry project (12 credits)
- BIOC3988 Biochemistry internship (6 credits)
- SCNC2005 Career development for science students (non-credit bearing)
- SCNC2988 Service learning internship (non-credit bearing)
- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)
- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (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 (BIOC2XXX or BIOC3XXX level). Students are not required to take EL if this Science major is taken as a second major but a 6-credit advanced level course in the second major must be taken to fulfill the credit requirement.

Major in Biology (Offered to students admitted to Year 1 in 2010-2011)**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)**1. Introductory level courses (18 credits)**

- BIOL0604 Evolutionary diversity (6 credits)
 BIOL1122 Functional biology (6 credits)
 BIOL1133 Biological sciences laboratory course (6 credits)

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

2. Advanced level courses (48 credits)

- BIOL2112 Plant physiology (6 credits)
 BIOL2115 Cell biology and cell technology (6 credits)
 BIOL2116 Genetics I (6 credits)
 BIOL2215 Animal physiology: functional interactions with environment (6 credits)
 BIOL2303 Molecular biology (6 credits)

Plus 18 credits of BIOL2XXX or BIOL3XXX level course

Students are recommended to take the following courses:

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

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 credits)
- BIOL2320 Directed studies in biological sciences (6 credits)
- BIOL3321 Biological sciences project (12 credits)
- BIOL3988 Biological sciences internship (6 credits)
- SCNC2005 Career development for science students (non-credit bearing)
- SCNC2988 Service learning internship (non-credit bearing)
- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)
- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (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 (BIOL2XXX or BIOL3XXX level).

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

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

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

- BIOL1122 Functional biology (6 credits)
 BIOL1125 Introduction to biochemistry (6 credits)
 BIOL1133 Biological sciences laboratory course (6 credits)

2. Advanced level courses (48 credits)

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

Plus at least 12 credits of the following courses:

- BIOL2111 Molecular microbiology (6 credits)
 BIOL2116 Genetics I (6 credits)
 BIOL2203 Reproduction and reproductive biotechnology (6 credits)
 BIOL2205 Immunology (6 credits)
 BIOL2302 Fermentation technology (6 credits)
 BIOL2608 Biometrics (6 credits)
 BIOL3214 General virology (6 credits)
 BIOL3219 Clinical microbiology and applied immunology (6 credits)
 BIOL3307 Biotechnology industry (6 credits)

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 credits)
- BIOL2320 Directed studies in biological sciences (6 credits)
- BIOL3321 Biological sciences project (12 credits)
- BIOL3988 Biological sciences internship (6 credits)
- SCNC2005 Career development for science students (non-credit bearing)
- SCNC2988 Service learning internship (non-credit bearing)
- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)
- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (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 (BIOL2XXX or BIOL3XXX level).

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

Major in Chemistry (Offered to students admitted to Year 1 in 2010-2011)**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 practice 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 CHEM0008 Fundamental chemistry

Minimum Credit Requirement: 72 credits (18 credits introductory level, 54 credits advanced level courses including experiential learning requirement)

Impermissible Combination: Minor in Chemistry

Required courses (72 credits)

1. Introductory level courses (18 credits)

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

2. Advanced level courses (48 credits)

- CHEM2202 Chemical instrumentation (6 credits)
 CHEM2302 Intermediate inorganic chemistry (9 credits)
 CHEM2402 Intermediate organic chemistry (9 credits)
 CHEM2503 Intermediate physical chemistry (9 credits)
 CHEM2510 Principles and applications of spectroscopic and analytical techniques (6 credits)

Plus at least 9 credits of advanced level Chemistry courses (CHEM2XXX or CHEM3XXX level) of which 6 credits must be at CHEM3XXX level, subject to prerequisite requirements. (note 1)

3. Experiential learning requirement (6 credits) *

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

- CHEM2111 Directed studies in chemistry (6 credits)
- CHEM3105 Chemistry project (12 credits)
- CHEM3988 Chemistry internship (6 credits)
- SCNC2005 Career development for science students (non-credit bearing)
- SCNC2988 Service learning internship (non-credit bearing)
- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)
- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (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 (CHEM2XXX or CHEM3XXX level). Students are not required to take EL if this Science major is taken as a second major but a 6-credit advanced level course in the second major must be taken to fulfill the credit requirement.

Notes:

- 1 Students who wish to specialize in a certain area are recommended to choose courses from the following lists.
 - (a) For students who are interested in Analytical Chemistry: CHEM2102, CHEM2207, 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 (Offered to students admitted to Year 1 in 2010-2011)**Objectives:**

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

Learning Outcomes:

- a. Students would be able to describe the key concepts in the conventional areas of the geosciences, covering the areas of earth systems, physical geology, historical geology, atmospheric system, oceanography, geochemistry, geophysics, and earth resources.
(by means of coursework and learning activities in the major or minor curriculum)
- b. Students would have acquired the ability to make observation, description, measurement and analysis of common geological features and experience with geological mapping on 1:10,000 scale.
(by requiring of no less than 56 days of field work in the major)

- c. Students would be able to cooperate and work with other students in an effective manner and have learned to accept and appreciate different cultures.
(by means of requiring students to attend at least one overseas field camp in which students have to live and work together for 3 weeks consecutively)
- d. Students would have improved their communication skills.
(by means of frequent opportunities and occasions in major in which students have to give oral and posters presentations to a peer audience)
- e. Students would have gained some insights in the real-life industrial environment and developed connection within the geosciences profession.
(by arrangement for students internship opportunities of no less than three weeks with companies or government)

Minimum Entry Requirement: NIL

Minimum Credit Requirement: 72 credits (18 credits introductory level, 54 credits advanced level courses including experiential learning requirement)

Impermissible Combination: Minor in Earth Sciences

Required courses (72 credits)

1. Introductory level courses (18 credits)

- EASC0105 Earth through time (6 credits)
- EASC0116 Introduction to physical geology (6 credits)
- EASC0118 Blue planet (6 credits)

2. Advanced level courses (48 credits)

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

3. Experiential learning requirement (6 credits) *

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

- EASC2301 Field camps (6 credits)
- EASC2307 Directed studies in earth sciences (6 credits)
- EASC3308 Earth sciences project (12 credits)
- EASC3988 Earth sciences internship (6 credits)
- SCNC2005 Career development for science students (non-credit bearing)
- SCNC2988 Service learning internship (non-credit bearing)
- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)
- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (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 (EASC2XXX or EASC3XXX level).

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

Notes:

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

(a) Geology theme

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

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

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

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

(b) Environmental Geology theme

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

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

(c) Atmospheric and Oceanic Studies theme

Objective: for students interested in studying the dynamics of atmospheres and oceans.

Minimum requirements: EASC2005; EASC2127; EASC2128; EASC2129; EASC2130; EASC2131; plus any 12 credits advanced level Earth Sciences courses (EASC2000 or EASC3000 level)

Major in Ecology and Biodiversity (Offered to students admitted to Year 1 in 2010-2011)

Objectives:

This major is directed at teaching students: (1) how organisms interact with each other and their environments, (2) how species are distributed throughout the world, and (3) key threats and approaches to conserving biodiversity. Special reference is made to Hong Kong and Asia; the ways in which humans have impacted upon natural environments; and, the approaches used to manage or ameliorate those impacts. This major is based around a first year-core, which emphasizes plant and animal biology and includes a compulsory week-long residential field trip. The second and third year of the major teaches students about the ecology and biodiversity of different ecosystems (e.g. marine and freshwater environments) with an emphasis on field work, introduces the use of statistical and molecular techniques in ecology, and focuses on certain applied topics such as environmental impact assessment, ecotoxicology, fisheries and mariculture, and biodiversity conservation. Students have an opportunity to conduct independent research in ecology and biodiversity as a final year project or a dissertation under the close supervision of an individual staff member. Apart from the fundamental knowledge and skills in understanding and managing biodiversity offered in the core courses of this major, strong emphasis is placed upon experiential learning such as overseas field expedition and work placement in the environmental sector. Biodiversity conservation requires scientific input as well as passion. Through the range of formal field-based courses as well as extra-curricular activities offered, students taking this major will have opportunities to participate in research, field conservation and education projects both locally and internationally. Assistance will be provided so that students can develop expertise in one or a few groups of plants or animals, as familiarity with species identification is an essential prerequisite of biodiversity scientists or conservation biologists.

Learning Outcomes:

- a. Understand and appreciate the major living and non-living components of the regional and global environment, and how they interact; identify threats to them; and know how these threats can be mitigated.
(by means of coursework, laboratory-based, tutorial classes and/or project-based learning in the curriculum)
- b. Understand and appreciate the variety of life in Hong Kong's and Southeast Asia's natural habitats, and become equipped to understand, study, manage and protect that diversity.
(by means of coursework, laboratory-based, tutorial classes and/or project-based learning in the curriculum)
- c. Have sufficient experience of the basic techniques of modern ecological science and prepare to learn new ones for specific tasks.
(by means of coursework, laboratory-based, tutorial classes and/or project-based learning in the curriculum)
- d. Are able to use IT tools appropriately, and access and evaluate materials from libraries, archives and the Internet.
(by means of coursework, laboratory-based, tutorial classes and/or project-based learning in the curriculum)

- e. Demonstrate original, independent and critical thinking, with mastery of a range of communication skills.
(by means of coursework, project-based and presentation opportunities in the curriculum)
- f. Have the skill and knowledge to pursue postgraduate ecological research or to develop a career in nature conservation and environmental education, especially in Hong Kong and southern China.
(by means of coursework, tutorial classes, project-based and research-based learning in the curriculum)
- g. Are motivated and sufficiently equipped to be able to apply the knowledge solve local, regional and global environmental problems.
(by means of coursework, laboratory-based, tutorial classes, experiential learning and/or project-based learning in the curriculum)

Minimum Entry Requirement: NIL

Minimum Credit Requirement: 72 credits (18 credits introductory level, 54 credits advanced level courses including experiential learning requirement)

Impermissible Combination: Minor in Ecology and Biodiversity

Required courses (72 credits)

1. Introductory level courses (18 credits)

- BIOL0600 Ecology of Hong Kong (6 credits)
BIOL0604 Evolutionary diversity (6 credits)
BIOL0625 Ecology and evolution (6 credits)

2. Advanced level courses (48 credits)

- BIOL2608 Biometrics (6 credits)
BIOL2611 Systematics and phylogenetics (6 credits)
BIOL2612 Conservation ecology (6 credits)

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

- BIOL2210 Evolution (6 credits)
BIOL2606 Environmental microbiology (6 credits)
BIOL2607 Fish biology (6 credits)
BIOL2610 Biological oceanography (6 credits)
BIOL2615 Freshwater ecology (6 credits)
BIOL2617 Coastal ecology (6 credits)
BIOL2619 Terrestrial ecology (6 credits)
BIOL2621 Plant structure and evolution (6 credits)
BIOL2622 The biology of marine mammals (6 credits)
BIOL3621 Fisheries and mariculture (6 credits)
BIOL3622 Ecological impact assessment (6 credits)

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 credits)
- BIOL2320 Directed studies in biological sciences (6 credits)
- BIOL3321 Biological sciences project (12 credits)
- BIOL3988 Biological sciences internship (6 credits)
- SCNC2005 Career development for science students (non-credit bearing)
- SCNC2988 Service learning internship (non-credit bearing)
- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)
- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (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 (BIOL2XXX or BIOL3XXX level).

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

Notes:

- 1 Students who wish to specialize in a certain area are recommended to choose courses from the following lists.
 - (a) For students who are interested in ecology and evolution: BIOL2210, BIOL2606, BIOL2615, BIOL2616, BIOL2617, BIOL2619.
 - (b) For students who are interested in marine biology: BIOL2607, BIOL2610, BIOL2617, BIOL2622, BIOL3621.

Major in Environmental Protection (Offered to students admitted to Year 1 in 2008-2009)

Objectives:

Humans are responsible for modification and degradation of nature yet it is only by human actions that we can protect habitats, ecosystems and the organisms that they contain for future generations. This Major helps students understand the causes of environmental degradation, and the ways in which they can be reduced or mitigated, including topics such as environmental impact assessment, ecotoxicology and bioremediation. Conservation biology and fisheries are also important components of this Major, which aims to provide the intellectual and practical skills needed for professionals working in environmental protection and related jobs.

Learning Outcomes: NIL

Minimum Entry Requirement: AL or AS Chem. or equivalent or a pass in CHEM0004 Fundamental chemistry (note 1) / CHEM0008 Fundamental chemistry

Minimum Credit Requirement: 72 credits (18 credits introductory level, 54 credits advanced level courses including experiential learning requirement)

Impermissible Combination: Major in Biology
Minor in Environmental Protection

Required courses (72 credits)

1. Introductory level courses (18 credits)

CHEM1007 Basic chemistry for biological sciences (note 1) OR CHEM1009 Basic chemistry (6 credits)

Plus at least 12 credits of the following courses:

- BIOL0129 Introductory microbiology (note 2) (3) OR BIOL0135 Introductory microbiology (6 credits)
- BIOL0601 Ecology of Hong Kong (note 2) (3) OR BIOL0600 Ecology of Hong Kong (6 credits)
- BIOL0603 Ecology and evolution (note 1) (3) OR BIOL0625 Ecology and evolution (6 credits)
- BIOL0605 Ecology field course (note 2) (3 credits)
- CHEM1003 Chemistry: the molecular world (6 credits)
- EASC0118 Blue planet (6 credits)
- EASC0120 Earth, environmental and society (6 credits)
- PHYS0628 Renewable energy (6 credits)

Alternative courses possible in the case of students taking Majors/Minors with an overlap of core courses:

- CHEM1003 Chemistry: the molecular world (6 credits)
- EASC0135 Introduction to atmospheres and oceans (3 credits)
- EASC0136 Introduction to climatology (3 credits)

2. Advanced level courses (48 credits)

- BIOL2612 Conservation biology OR Conservation ecology (6 credits)
- BIOL3622 Environmental impact assessment OR Ecological impact assessment (6 credits)
- BIOL3624 Environmental monitoring and remediation techniques (6 credits)
- CHEM2103 Chemical process industries and analysis (6 credits)
- EASC2128 Earth-ocean-atmosphere interactions (6 credits)

Plus at least 18 credits of the following courses:

- BIOL2606 Environmental microbiology (6 credits)
- BIOL2608 Biometrics (6 credits)
- BIOL2610 Biological oceanography (6 credits)
- BIOL2614 Environmental toxicology (6 credits)
- BIOL2615 Freshwater ecology (6 credits)
- BIOL2617 Coastal ecology (6 credits)
- BIOL3621 Fisheries and mariculture (6 credits)
- CHEM1401 Fundamentals of organic chemistry (6 credits)
- CHEM2102 Environmental chemistry (6 credits)
- CHEM2202 Chemical instrumentation (6 credits)
- CHEM2207 Food and water analysis (6 credits)
- EASC2127 Global changes: anthropogenic impact (6 credits)
- EASC2129 Physical oceanography (6 credits)
- EASC3132 Earth resources (6 credits)

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 credits)
- BIOL2320 Directed studies in biological sciences (6 credits)
- BIOL3321 Biological sciences project (12 credits)
- BIOL3988 Biological sciences internship (6 credits)
- EASC3308 Earth sciences project (12 credits)
- SCNC2005 Career development for science students (non-credit bearing)
- SCNC2988 Service learning internship (non-credit bearing)
- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)
- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (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 (BIOL2XXX or BIOL3XXX level).

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

Notes:

- 1 Not available in 2009-2010 or thereafter.
- 2 Not available in 2010-2011 or thereafter.

Major in Environmental Science (Offered to students admitted to Year 1 in 2010-2011)

Objectives:

The Environmental Science curriculum in the Faculty of Science aims to provide students with a strong scientific and technological background for understanding and addressing the environmental issues faced by humankind. This includes a flexible teaching and learning programme so that students can explore environmental issues from a range of aspects. Core courses in the curriculum emphasize fundamental knowledge in life and environment, physical and sustainable environment, pollution, monitoring and management. Throughout the curriculum, students are encouraged to undertake their own independent study from primary and secondary sources to incorporate critical thinking, field and laboratory work, documentary and archive scholarship, as integrated elements of relevant courses. By completing the curriculum, students are expected to have enhanced their knowledge in environmental science and have improved their problem-solving ability, communication and social skills. Students will be prepared to work in industries and government agencies, where they will help manage wisely the resources for which they are responsible.

Learning Outcomes:

- a. Knowledge to identify and describe the nature, and context of key issues in environmental science.
(by means of lectures, coursework, and tutorial classes in the curriculum)
- b. Knowledge to use and to critically analyze a range of forms and sources of environmental data.
(by means of lectures, coursework and laboratory-based learning in the curriculum)
- c. Skills to observe, describe, measure and analyze physical, biological and chemical characteristics of natural and man-made environments.
(by means of lectures, coursework and laboratory-based learning in the curriculum)
- d. Advanced level of ability in scientific inquiry and effective communications.
(by means of coursework, tutorial classes and laboratory-based learning in the curriculum)

Minimum Entry Requirement: NIL

Minimum Credit Requirement: 78 credits (24 credits introductory level, 54 credits advanced level courses including experiential learning requirement)

Impermissible Combination: Nil

Required courses (78 credits)

1. Introductory level courses (24 credits)

ENVS0001 Introduction to environmental science (6 credits)

Plus 18 credits of the following courses:

ENVS1002 Environmental life science OR BIOL0126 Fundamentals of biology (6 credits)

CHEM0008 Fundamental chemistry OR CHEM1009 Basic chemistry (6 credits)

EASC0118 Blue planet (6 credits)

PHYS0625 Physics by inquiry OR PHYS1417 Basic physics (6 credits)

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

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

Area 1: Life and Environment

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

BIOL2606 Environmental microbiology (6 credits)

BIOL2610 Biological oceanography (6 credits)

- BIOL2612 Conservation biology (6 credits)
- BIOL2615 Freshwater ecology (6 credits)
- BIOL2617 Coastal ecology (6 credits)
- BIOL2619 Terrestrial ecology (6 credits)
- BIOL3621 Fisheries and mariculture (6 credits)
- ENVS2003 Demographic principles in population and evolutionary biology (6 credits)
- ENVS2012 Global change ecology (6 credits)
- ENVS3013 Ecological demography in changing environments (6 credits)

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 credits)
- EASC2127 Global change: anthropogenic impact (6 credits)
- EASC2129 Physical oceanography (6 credits)
- EASC2131 A cool world: ice ages and climate change (6 credits)
- EASC3132 Earth resources (6 credits)
- ENVS2007 Natural hazards and mitigation (6 credits)
- ENVS2010 Sustainable energy and environment (6 credits)

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

Area 4: Monitoring and Management

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

- BIOL3622 Ecological impact assessment (6 credits)
- EASC2130 Earth observation and remote sensing (6 credits)
- ENVS2004 Environment and society (6 credits)
- ENVS3012 Business, economics and the environment (6 credits)
- ENVS3014 Environmental risk assessment and management (6 credits)
- MATH2408 Computational methods and differential equations with applications (6 credits)
- MATH2901 Operations research I (6 credits)
- STAT2311 Computer-aided data analysis (6 credits)

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 credits)

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

- ENVS2011 Directed studies in environmental science (6 credits)
- ENVS3015 Environmental science project (12 credits)
- ENVS3988 Environmental science internship (6 credits)
- SCNC2005 Career development for science students (non-credit bearing)
- SCNC2988 Service learning internship (non-credit bearing)
- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)
- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (non-credit bearing)

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

Notes:

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

Major in Food and Nutritional Science (Offered to students admitted to Year 1 in 2010-2011)

Objectives:

The Food and Nutritional Science Major at the University of Hong Kong aims to offer an exciting, dynamic, and challenging environment to prepare the students for career opportunities in food and nutritional science. The goals of the programme are to provide the students with:

- (a) A detailed critical knowledge and understanding of the theoretical and practical aspects of food science and technology and nutrition and their relationship to human health.
- (b) A critical knowledge and understanding on the relationship between food safety and a wide range of social, legal, technological and environmental factors.
- (c) A curriculum meeting the requirements for higher degree in MPhil and PhD and or the taught Master of Science degrees in the field of Food industry: Management and Marketing, Food Safety and Toxicology and the postgraduate diploma in dietetics.

The mission is to provide a progressive and effective 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 and Nutritional Science

Required courses (72 credits)

1. Introductory level courses (18 credits)

- BIOL1125 Introduction to biochemistry OR CHEM1401 Fundamentals of organic chemistry (6 credits)
- BIOL1514 Nutrition and metabolism (6 credits)
- BIOL1528 Food chemistry (6 credits)

Alternative course possible in the case of students taking Majors / Minors with an overlap of core courses:

- BIOL1122 Functional biology (6 credits)

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

At least 12 credits of the following courses:

- BIOL2535 Food processing and engineering laboratory course (6 credits)
- BIOL2536 Food and nutrients analysis laboratory course (6 credits)
- BIOL2537 Laboratory in nutritional science (6 credits)
- BIOL3539 Food safety and toxicology laboratory course (6 credits)

Plus at least 36 credits of the following courses:

- BIOL2218 Human physiology (6 credits)
- BIOL2302 Fermentation technology (6 credits)
- BIOL2503 Grain production and utilization (6 credits)
- BIOL2507 Meat and dairy science (6 credits)
- BIOL2515 Food microbiology (6 credits)
- BIOL2529 Food and nutritional toxicology (6 credits)
- BIOL2530 Molecular biology and nutrigenomics (6 credits)
- BIOL2531 Principles of Chinese medicinal diet (6 credits)
- BIOL2532 Diet and disease (6 credits)
- BIOL2533 Nutrition and life cycle (6 credits)
- BIOL2534 Nutrition and public health (note 2) (6 credits)
- BIOL3527 Food safety and quality management (6 credits)
- BIOL3538 Food product development (6 credits)
- BIOL3540 Diet, brain function and behaviour (6 credits)
- PBSL2229 Exercise physiology (6 credits)

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 credits)
- BIOL2320 Directed studies in biological sciences (6 credits)
- BIOL3321 Biological sciences project (12 credits)
- BIOL3988 Biological sciences internship (6 credits)
- SCNC2005 Career development for science students (non-credit bearing)
- SCNC2988 Service learning internship (non-credit bearing)
- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)
- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (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 (BIOL2XXX or BIOL3XXX level).

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

Notes:

- 1 Students who wish to specialize in a certain area are recommended to choose courses from the following lists:
 - (a) Food Science and Technology: BIOL2302, BIOL2503, BIOL2507, BIOL2515, BIOL2535, BIOL2536, BIOL3527, BIOL3538, BIOL3539.
 - (b) Nutrition and Health Science: BIOL2218, BIOL2529, BIOL2530, BIOL2531, BIOL2532, BIOL2533, BIOL2534, BIOL2536, BIOL2537, BIOL3540, PBSL2229.
 - (c) Food Safety and Toxicology: BIOL2218, BIOL2515, BIOL2529, BIOL2536, BIOL3527, BIOL3539.
- 2 Not offer in 2010-2011.

Major in Materials Science (Offered to students admitted to Year 1 in 2008-2009)**Objectives:**

In the past few decades, we have witnessed a rapid development in technology that has had a major impact on the way we live. For example, synthetic fabrics have revolutionized the clothing industry, and the on-board computers that helped guide the Apollo 11 mission to the moon were less powerful than the personal computers that sit on the desks in every office and in many homes today. All these changes were due to the fact that new materials were developed, which was the collective effort of scientists from many different areas. Materials science is an interdisciplinary subject that involves studies of the chemical and physical properties of materials. In this Major, students will be required to take basic courses in chemistry and physics. The chemistry of materials synthesis (e.g. organic and inorganic materials) and their physical properties (mechanical, electrical, and optical properties) will be introduced. In the second and third years, advanced courses will focus on polymeric materials, nanomaterials, semiconducting materials, and their characterization techniques. In addition, students are required to take advanced physics and chemistry courses as electives. The Major is designed for students who are interested in materials science and technology for postgraduate studies.

Learning Outcomes: NIL

Minimum Entry Requirement: 1. AL Chemistry; and AL/AS Physics or AL Engineering Science; or
2. a pass in PHYS0114 Fundamental physics I and PHYS0115 Fundamental physics II; and CHEM0004 Fundamental chemistry (note 1) / 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: Nil

Required courses (72 credits) (note 2)

1. Introductory level courses (18 credits)

CHEM1002 Chemistry: principles and concepts (6 credits)

PHYS1417 Basic physics (6 credits)

Plus at least 6 credits of the following courses:

CHEM1003 Chemistry: the molecular world (6 credits)

CHEM1005 Introduction to materials science (6 credits)

PHYS1315 Methods in physics I (6 credits)

2. Advanced level courses (48 credits)

CHEM2109 Introduction to materials chemistry (6 credits)

CHEM2510 Principles and applications of spectroscopic and analytical techniques (6 credits)

PHYS2627 Introductory quantum physics (6 credits)

Plus 12 credits of the following courses, of which at least 6 credits must be at the CHEM3XXX level:

CHEM2103 Chemical process industries and analysis (6 credits)

CHEM2202 Chemical instrumentation (6 credits)

CHEM3107 Interfacial science and technology (6 credits)

CHEM3110 Advanced materials (6 credits)

Plus 18 credits of the following physics courses:

PHYS2221 Introductory solid state physics (6 credits)

PHYS2222 Waves and optics (6 credits)

PHYS2227 Laser and spectroscopy (6 credits)

PHYS2235 Physics of nanomaterials (6 credits)

PHYS2236 Device physics (6 credits)

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 credits)
- CHEM3105 Chemistry project (12 credits)
- CHEM3988 Chemistry internship (6 credits)
- PHYS2533 Directed studies in physics (6 credits)
- PHYS3531 Physics project (12 credits)
- PHYS3988 Physics internship (6 credits)
- SCNC2005 Career development for science students (non-credit bearing)
- SCNC2988 Service learning internship (non-credit bearing)
- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)
- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (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 / physics course (CHEM2XXX or PHYS2XXX or CHEM3XXX or PHYS3XXX or PHYS6XXX level).

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

Notes:

- 1 CHEM0004 is not available in 2009-2010 or thereafter.
- 2 For students having major/major, or major/minor combinations of Materials Science / Chemistry, or Materials Science / Physics, a set of replacement courses from the Departments of Chemistry and Physics will be made available so that there will be no overlap with the core courses in this major.

Major in Mathematics (Offered to students admitted to Year 1 in 2010-2011)

Objectives:

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

Learning Outcomes:

- a. Students should be able to describe and present fundamental concepts in mathematics.
(by means of coursework and learning activities in the major or minor curriculum)
- b. Student should be able to apply mathematical theory and techniques to different areas of Sciences.
(by means of coursework and learning activities in the major or minor curriculum)
- c. Students should be able to communicate in mathematical language and present scientific arguments.
(by means of coursework, seminars, guided studies and projects)
- d. Students should be able to collaborate and work with other students in an effective manner.
(by means of guided studies, projects and seminars)
- e. Students should be able to appreciate the beauty and power of mathematics.
(by means of guided studies, projects and seminars)

Minimum Entry Requirement: (note 1)

1. HKCEE Additional Mathematics and AS Mathematics and Statistics; or
2. AL Pure Mathematics; or
3. a pass in MATH0201 Basic calculus (for those with HKCEE Math only) or a pass in MATH1804 University mathematics A (for those with AS Math and Stat only)

Minimum Credit Requirement: 72 credits (18 credits introductory level, 54 credits advanced level courses including experiential learning requirement)

Impermissible Combination: Major in Mathematics/Physics
Minor in Mathematics

Required courses (72 credits)

1. Introductory level courses (18 credits)

- MATH1001 Fundamental concepts of mathematics (6 credits)
MATH1111 Linear algebra (6 credits)
MATH1211 Multivariable calculus (6 credits)

2. Advanced level courses (48 credits)

MATH2201 Introduction to mathematical analysis (6 credits)

MATH2301 Algebra I (6 credits)

MATH2401 Analysis I (6 credits)

Plus at least 18 credits of the following courses (note 2):

MATH2304 Introduction to number theory (6 credits)

MATH2403 Functions of a complex variable (6 credits)

MATH2405 Differential equations (6 credits)

MATH2600 Discrete mathematics (6 credits)

MATH2601 Numerical analysis (6 credits)

MATH2603 Probability theory (6 credits)

MATH2901 Operational research I (6 credits)

MATH2904 Introduction to optimization (6 credits)

MATH2911 Game theory and strategy (6 credits)

Plus at least 12 credits of advanced level Mathematics courses (MATH2XXX or MATH3XXX or MATH6XXX level), subject to prerequisite requirements.

3. Experiential learning requirement (6 credits) *

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

- MATH2002 Mathematics seminar (note 3) (6 credits)
- MATH2999 Directed studies in mathematics (6 credits)
- MATH3988 Mathematics internship (6 credits)
- MATH3999 Mathematics project (12 credits)
- SCNC2005 Career development for science students (non-credit bearing)
- SCNC2988 Service learning internship (non-credit bearing)
- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)
- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (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 or MATH6XXX level).

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

Notes:

- 1 Students with different mathematics background must consult the Department of Mathematics for advice on the bridging courses.
- 2 Students who wish to specialize in a certain area are recommended to choose courses from the following lists.
 - (a) For students who are interested in pure mathematics: MATH2303, MATH2304, MATH2402, MATH2403, MATH3302, MATH3404, MATH3501.
 - (b) For students who are interested in computational mathematics, logistics, and/or operations research: MATH2303, MATH2600, MATH2601, MATH2603, MATH2901, MATH2904, MATH2905, MATH3602, MATH3902, MATH3903.
 - (c) For students who are interested in economics and finance, and plan to take some professional examinations in related fields: MATH2906, MATH2907, and non-mathematics courses BUSI1002, FINA1001, FINA2802, ECON0701, ECON2101, ECON2102.
- 3 MATH2002 is for first year BSc students only.

Major in Mathematics/Physics (Offered to students admitted to Year 1 in 2010-2011)

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)
- 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: (note 1)

1. AL/AS Physics or AL Engineering Science; and
2. HKCEE Additional Mathematics and AS Mathematics and Statistics, or AL Pure Mathematics; or
3. or a pass in PHYS0625 Physics by inquiry or equivalent and pass in MATH0201 Basic calculus (for those with HKCEE only) or a pass in MATH1804 University mathematics A (for those with AS Math and Stat only)

Minimum Credit Requirement: 78 credits (24 credits introductory level, 54 credits advanced level courses including experiential learning requirement)

Impermissible Combination: Major in Mathematics; Physics
Minor in Mathematics; Physics

Required courses (78 credits) (note 2)

1. Introductory level courses (24 credits) (note 3)

MATH1111 Linear algebra (6 credits)

MATH1211 Multivariable calculus (6 credits)

PHYS1414 General physics I (6 credits)

PHYS1415 General physics II (6 credits)

2. Advanced level courses (48 credits) (note 4)

- MATH2201 Introduction to mathematical analysis (6 credits)
 MATH2301 Algebra I (6 credits)
 MATH2403 Functions of a complex variable (6 credits)
 MATH2405 Differential equations (6 credits)
 PHYS2321 Introductory electromagnetism (6 credits)
 PHYS2322 Statistical mechanics and thermodynamics (6 credits)
 PHYS2626 Introductory classical mechanics (6 credits)
 PHYS2627 Introductory quantum physics (note 5) (6 credits)

3. Experiential learning requirement (6 credits) *

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

- MATH2002 Mathematics seminar (note 6) (6 credits)
- MATH2999 Directed studies in mathematics (6 credits)
- MATH3988 Mathematics internship (6 credits)
- MATH3999 Mathematics project (12 credits)
- PHYS2533 Directed studies in physics (6 credits)
- PHYS3531 Physics project (12 credits)
- PHYS3987 Quantitative tools in physics (non-credit bearing)
- PHYS3988 Physics internship (6 credits)
- SCNC2005 Career development for science students (non-credit bearing)
- SCNC2988 Service learning internship (non-credit bearing)
- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)
- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (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 MATH6XXX or PHYS2XXX or PHYS3XXX or PHYS6XXX level). Students are not required to take EL if this Science major is taken as a second major but a 6-credit advanced level course in the second major must be taken to fulfill the credit requirement.

Notes:

- 1 Students with different mathematics background must consult the Department of Mathematics for advice on the bridging courses.
- 2 Students would have already satisfied requirements from Blocks A and B with this curriculum.
- 3 Students are recommended to take also MATH1001.
- 4 Students who intend to pursue further studies in Mathematics/Physics are recommended to take also MATH2401, MATH3501, PHYS3331, and PHYS3332.
- 5 Students may consider taking PHYS2627 as early as possible to allow for maximum flexibility in course selection for advanced level courses.
- 6 MATH2002 is for first year BSc students only.

Major in Microbiology (Offered to students admitted to Year 1 in 2010-2011)**Objectives:**

The aim of this major is to provide students with a stimulating, valuable and enjoyable learning experience in microbiology, a key life science discipline for the 21st century. Microbiology lies at the heart of understanding human health and disease, environmental processes and protection and advances in biotechnology and industrial microbiology. The curriculum places a strong emphasis on modern molecular approaches and analytical techniques. Core courses provide training in fundamental

scientific skills and students also have the flexibility to choose 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)

1. Introductory level courses (18 credits)

- BIOL0135 Introductory microbiology (6 credits)
 BIOL1125 Introduction to biochemistry OR BIOC1001 Basic biochemistry (6 credits)
 BIOL1133 Biological science laboratory course (6 credits)

2. Advanced level courses (48 credits)

- BIOL2111 Molecular microbiology (6 credits)
 BIOL2205 Immunology (6 credits)
 BIOL2303 Molecular biology (6 credits)
 BIOL2324 Microbial physiology and biochemistry (6 credits)

Plus at least 24 credits of the following courses:

- BIOL2302 Fermentation technology (6 credits)
 BIOL2515 Food microbiology (6 credits)
 BIOL2606 Environmental microbiology (6 credits)
 BIOL3214 General virology (6 credits)
 BIOL3219 Clinical microbiology and applied immunology (6 credits)
 BIOL3317 Microbial biotechnology (6 credits)
 BIOL3325 Molecular phylogenetics and evolution (6 credits)
 BIOL3624 Environmental monitoring and remediation techniques (6 credits)

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 credits)
- BIOL2320 Directed studies in biological sciences (6 credits)
- BIOL3321 Biological sciences project (12 credits)
- BIOL3988 Biological science internship (6 credits)
- SCNC2005 Career development for science students (non-credit bearing)
- SCNC2988 Service learning internship (non-credit bearing)
- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)
- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (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 (BIOL2XXX or BIOL3XXX level).

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

Major in Physics (Offered to students admitted to Year 1 in 2010-2011)

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 PHYS0625 Physics by inquiry; or equivalent

Minimum Credit Requirement: 72 credits (18 credits introductory level, 54 credits advanced level courses including experiential learning requirement)

Impermissible Combination: Major in Mathematics/Physics
Minor in Physics

Required courses (72 credits)**1. Introductory level courses (18 credits)**

PHYS1414 General physics I (6 credits)

PHYS1415 General physics II (6 credits)

Plus at least 6 credits of introductory level Physics courses (PHYS0XXX or PHYS1XXX level), subject to prerequisite requirements.

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

PHYS2627 Introductory quantum physics (note 2) (6 credits)

Plus at least 12 credits of the following courses:

PHYS2321 Introductory electromagnetism (6 credits)

PHYS2322 Statistical mechanics and thermodynamics (6 credits)

PHYS2323 Introductory quantum mechanics (6 credits)

PHYS2626 Introductory classical mechanics (6 credits)

Plus at least 30 credits of advanced level Physics courses (PHYS2XXX or PHYS3XXX or PHYS6XXX level), subject to prerequisite requirements.

3. Experiential learning requirement (6 credits) *

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

- PHYS2533 Directed studies in physics (6 credits)
- PHYS3531 Physics project (12 credits)
- PHYS3987 Quantitative tools in physics (non-credit bearing)
- PHYS3988 Physics internship (6 credits)
- SCNC2005 Career development for science students (non-credit bearing)
- SCNC2988 Service learning internship (non-credit bearing)
- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)
- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (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 (PHYS2XXX or PHYS3XXX or PHYS6XXX level).

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

Notes:

- 1 Students who intend to pursue further studies in Physics are recommended to take also PHYS3331 and PHYS3332.
- 2 Students may consider taking PHYS2627 as early as possible to allow for maximum flexibility in course selection for advanced level courses.

Major in Risk Management (Offered to students admitted to Year 1 in 2010-2011)**Objectives:**

The Risk Management curriculum at the University of Hong Kong aims to provide students with the skills and expertise to enable them to acquire the theory and methodology behind the scientific process of risk management, with application to actuarial science, finance and other areas of interest. It is

designed to provide solid training in the concepts of the risk management process, statistical models and methods of risk management, and good risk management practice. Core courses in the curriculum emphasize fundamental concepts and nature of risk assessment, risk management and governance from different standpoints while elective courses provide either training in specific Risk Management disciplines or an extension of knowledge aiming to give students more modeling, technical and analytical skills in risk management, including discrete-time models in finance, stochastic calculus with financial applications, and financial time series modeling. Through participating in experiential learning activities including research-based projects, industrial internships and overseas exchanges, students could enhance their knowledge in risk management and exposure in managing risk in practice, and improve their thinking and communication skills.

Learning Outcomes:

- a. Students would be able to identify and categorize the various risks faced by an organization and be able to demonstrate a critical understanding of generic risk management issues and techniques.
(by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- b. Students would be able to analyze and assess risk management situations, and be able to deal with qualitative as well as quantitative aspects appropriate to the situation.
(by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- c. Students would be able to critically evaluate and make effective use of models and techniques for risk assessment and management.
(by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- d. Students would be able to make informed risk management decisions, employ any techniques necessary to acquire and interpret relevant data and information from different sources and the factors that influence their perceptions of risk identification, risk reduction, risk mitigation and risk transfer.
(by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- e. Students would gain insights into current advances in risk management through either project or industrial training.
(by means of coursework, tutorial classes, project-based and/or experiential learning in the curriculum)

Minimum Entry Requirement: A pass in AL Pure Mathematics or equivalent, or MATH1804 University mathematics A, or MATH0211 Basic applicable mathematics with grade B- or above

Minimum Credit Requirement: 72 credits (18 credits introductory level, 54 credits advanced level courses including experiential learning requirement)

Impermissible Combination: Minor in Risk Management

Required courses (72 credits)

1. Introductory level courses (18 credits)

STAT1301 Probability and statistics I (6 credits)

STAT1302 Probability and statistics II (6 credits)

Plus at least 6 credits of the following courses:

STAT1303 Data management (6 credits)

STAT1304 Design and analysis of sample surveys (6 credits)

STAT1323 Introduction to demographic and socio-economic statistics (6 credits)

Alternative courses possible in the case of students taking Major/Minor in Statistics with an overlap of core courses:

Any 6-credit advanced level statistics course (STAT2XXX or STAT3XXX level)

2. Advanced level courses (48 credits)

- STAT2301 Linear statistical analysis (6 credits)
 STAT2309 The statistics of investment risk (6 credits)
 STAT2315 Practical mathematics for investment (6 credits)
 STAT3301 Time-series analysis (6 credits)

Alternative courses possible in the case of students taking Major/Minor in Statistics with an overlap of core courses:

Any from the list below

Plus at least 24 credits of the following courses:

- STAT2303 Probability modelling (6 credits)
 STAT2310 Risk management and insurance (6 credits)
 STAT2312 Data mining (6 credits)
 STAT3303 Derivatives and risk management (6 credits)
 STAT3320 Risk management and Basel II in banking and finance (6 credits)
 STAT3321 Credit risk analysis (6 credits)
 STAT3322 Market risk analysis (6 credits)
 STAT3821 Financial economics II (6 credits)

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 credits)
- STAT3319 Statistics project (12 credits)
- STAT3988 Statistics internship (6 credits)
- STAT3989 Essential IT skills for statistical and risk analysts (non-credit bearing)
- SCNC2005 Career development for science students (non-credit bearing)
- SCNC2988 Service learning internship (non-credit bearing)
- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)
- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (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 (STAT2XXX or STAT3XXX or STAT6XXX level).

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

Major in Statistics (Offered to students admitted to Year 1 in 2010-2011)**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 MATH1804 University mathematics A, or MATH0211 Basic applicable mathematics with grade B- or above

Minimum Credit Requirement: 72 credits (18 credits introductory level, 54 credits advanced level courses including experiential learning requirement)

Impermissible Combination: Minor in Statistics

Required courses (72 credits)**1. Introductory level courses (18 credits)**

STAT1301 Probability and statistics I (6 credits)

STAT1302 Probability and statistics II (6 credits)

Plus at least 6 credits of the following courses:

STAT1303 Data management (6 credits)

STAT1304 Design and analysis of sample surveys (6 credits)

STAT1323 Introduction to demographic and socio-economic statistics (6 credits)

Alternative courses possible in the case of students taking Major/Minor in Risk Management with an overlap of core courses:

Any 6-credit advanced level statistics course (STAT2XXX or STAT3XXX level)

2. Advanced level courses (48 credits)

STAT2301 Linear statistical analysis (6 credits)

STAT3301 Time-series analysis (6 credits)

STAT3302 Multivariate data analysis (6 credits)

STAT3304 Computer-aided statistical modelling (6 credits)

Plus at least 24 credits from Lists A and B, among which at least 6 credits from List A:

List A:

- STAT2302 Statistical inference (6 credits)
 STAT2303 Probability modelling (6 credits)
 STAT2304 Design and analysis of experiments (6 credits)
 STAT3316 Advanced probability (6 credits)
 STAT3317 Computational statistics (6 credits)

List B:

- STAT2305 Quality control and Management (6 credits)
 STAT2306 Business logistics (6 credits)
 STAT2307 Statistics in clinical medicine and bio-medical research (6 credits)
 STAT2308 Statistical genetics (6 credits)
 STAT2312 Data mining (6 credits)
 STAT2313 Marketing engineering (6 credits)
 STAT3306 Selected topics in statistics (6 credits)
 STAT3811 Survival analysis (6 credits)

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 credits)
- STAT3319 Statistics project (12 credits)
- STAT3988 Statistics internship (6 credits)
- STAT3989 Essential IT skills for statistical and risk analysts (non-credit bearing)
- SCNC2005 Career development for science students (non-credit bearing)
- SCNC2988 Service learning internship (non-credit bearing)
- Exchange study via HKU Worldwide or Science Faculty/Department Level (1st sem/2nd sem/1 yr) (non-credit bearing)
- Any other activities determined by the Faculty to conform to the spirit of experiential learning experience (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 (STAT2XXX or STAT3XXX or STAT6XXX level).

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

Minor in Actuarial Studies (Offered to students admitted to Year 1 in 2010-2011)**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 and 24 credits advanced level courses)

Impermissible Combination: Nil

Required courses (36 or 42 credits)

1. Introductory level courses (12 or 18 credits)

For students majoring in Risk Management or Statistics (12 credits)

STAT1323 Introduction to demographic and socio-economic statistics (6 credits)

STAT2303 Probability modelling (6 credits)

STAT2306 Business logistics (6 credits)

STAT2315 Practical mathematics for investment (6 credits)

For students minoring in Risk Management or Statistics (12 credits)

STAT1302 Probability and statistics II (6 credits)

STAT2303 Probability modelling (6 credits)

STAT2315 Practical mathematics for investment (6 credits)

For students not belonging to the above two categories (18 credits)

STAT1301 Probability and statistics I (6 credits)

STAT1302 Probability and statistics II (6 credits)

STAT1801 Probability and statistics: foundations of actuarial science (6 credits)

STAT2303 Probability modelling (6 credits)

STAT2315 Practical mathematics for investment (6 credits)

2. Advanced level courses (24 credits)

At least 24 credits of the following courses:

STAT2801 Life contingencies (6 credits)

STAT2805 Credibility theory and loss distributions (6 credits)

STAT2807 Corporate finance for actuarial science (6 credits)

STAT2812 Financial economics I (6 credits)

STAT3810 Risk theory (6 credits)

STAT3811 Survival analysis (6 credits)

STAT3821 Financial economics II (6 credits)

Minor in Astronomy (Offered to students admitted to Year 1 in 2010-2011)

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:

- a. 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)

- 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 opportunities of field activities in the curriculum)
- c. 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

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

Impermissible Combination: Major in Astronomy

Required courses (36 credits) (note 1)

1. Introductory level courses (12 credits)

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

PHYS0002 Nature of the universe II: stars, galaxies and cosmology for beginners (3 credits)

Plus at least 6 credits of introductory level Physics course (PHYS0XXX or PHYS1XXX level) (note 2 and 3)

2. Advanced level courses (24 credits)

At least 24 credits of advanced level Physics courses (PHYS2XXX or PHYS3XXX or PHYS6XXX) level, out of which at least 12 credits are of the following courses:

PHYS2021 The physical universe (6 credits)

PHYS2022 Observational astronomy (6 credits)

PHYS3031 Astrophysics (6 credits)

PHYS3033 General relativity (6 credits)

PHYS3034 Cosmology (6 credits)

PHYS3040 Stellar physics (6 credits)

Notes:

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

- 1 For students having major/minor combination of Physics / Astronomy, or Materials Science / Astronomy, any single introductory or advanced level Physics course can be used to satisfy a major or minor requirement only once.
- 2 Students without AL/AS Physics are strongly advised to take PHYS1417 to allow for maximum flexibility in selection of advanced level Physics courses. Students without HKCEE Physics are strongly advised to take PHYS0114 and PHYS0115 and PHYS1417 to allow for maximum flexibility in selection of advanced level Physics courses.
- 3 Students are advised to take at least one of the following courses: PHYS1414, PHYS1415, or PHYS1417 to allow for maximum flexibility in selection for advanced level Physics courses.

Minor in Biochemistry (Offered to students admitted to Year 1 in 2010-2011)

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:

- a. Students would be able to describe the fundamentals of biochemistry and molecular biology, and apply biochemical knowledge appropriately and effectively.
(by means of coursework and laboratory-based learning in the curriculum)

- b. Students would be able to integrate knowledge regarding the structure and function of biological molecules and how they come together to form the systems that make up life.
(by means of coursework and laboratory-based learning in the curriculum)
- c. Students would be able to develop a general interest in biochemistry and recognize the inter-relationship of biochemistry with other disciplines.
(by means of coursework and laboratory-based learning in the curriculum)

Minimum Entry Requirement: AL Biology or AS Chemistry or a pass in CHEM0008 Fundamental chemistry or equivalent

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

Impermissible Combination: Major in Biochemistry

Required courses (36 credits)

1. Introductory level courses (12 credits)

BIOC1001 Basic biochemistry (6 credits)

BIOC1003 Introduction to molecular genetics (6 credits)

2. Advanced level courses (24 credits)

BIOL2301 Protein structure and function (6 credits)

Plus at least 6 credits of BIOC2XXX level courses and at least 12 credits of BIOC3XXX level courses, subject to prerequisite requirements.

Minor in Biology (Offered to students admitted to Year 1 in 2010-2011)

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:

- a. Students will be able to develop scientific inquiry and critical thinking skills, including the ability to understand, analyze, and evaluate problems in order to develop solutions.
(by means of coursework and laboratory-based learning in the curriculum)
- b. Students will be able to understand broader scientific concepts, and be able to relate and apply these to scientific issues of significance in their daily lives and also of more global significance.
(by means of coursework and laboratory-based learning in the curriculum)
- c. Students will be able to improve their oral and written communication skills, and gain confidence in interacting with their peers and professors individually and as part of a team.
(by means of group projects, tutorial sessions and presentation opportunities in the curriculum)
- d. Students will be able to understand and apply key concepts in genetics, evolution, molecular biology, biochemistry, cell biology, physiology and ecosystem.
(by means of coursework and laboratory-based learning in the curriculum)

Minimum Entry Requirement: AL Biology or equivalent or a pass in BIOL0126 Fundamentals of biology

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

Impermissible Combination: Major in Biology

Required courses (36 credits)**1. Introductory level courses (12 credits)**

At least 12 credits of the following courses:

- BIOL0604 Evolutionary diversity (6 credits)
 BIOL1122 Functional biology (6 credits)
 BIOL1133 Biological sciences laboratory course (6 credits)

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

2. Advanced level courses (24 credits)

- BIOL2303 Molecular biology (6 credits)

Plus at least 18 credits of advanced level courses (BIOL2XXX and BIOL3XXX level)

Students are recommended to take the following courses:

- BIOL2112 Plant physiology (6 credits)
 BIOL2115 Cell biology and cell technology (6 credits)
 BIOL2116 Genetics I (6 credits)
 BIOL2117 Genetics II (6 credits)
 BIOL2207 Endocrinology: human physiology II (6 credits)
 BIOL2210 Evolution (6 credits)
 BIOL2215 Animal physiology: functional interactions with environment (6 credits)
 BIOL2218 Human physiology (6 credits)
 BIOL2611 Systematics and phylogenetics (6 credits)
 BIOL3325 Molecular phylogenetics and evolution (6 credits)

Minor in Biotechnology (Offered to students admitted to Year 1 in 2010-2011)**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 and 24 credits advanced level courses)

Impermissible Combination: Major in Biotechnology

Required courses (36 credits)**1. Introductory level courses (12 credits)**

At least 12 credits of the following courses:

- BIOL1122 Functional biology (6 credits)
 BIOL1125 Introduction to biochemistry (6 credits)
 BIOL1133 Biological sciences laboratory course (6 credits)

2. Advanced level courses (24 credits)

- BIOL2303 Molecular biology (6 credits)

Plus at least 18 credits of the following courses:

- BIOL2111 Molecular microbiology (6 credits)
 BIOL2116 Genetics I (6 credits)
 BIOL2203 Reproduction and reproductive biotechnology (6 credits)
 BIOL2205 Immunology (6 credits)
 BIOL2302 Fermentation technology (6 credits)
 BIOL3214 General virology (6 credits)
 BIOL3219 Clinical microbiology and applied immunology (6 credits)
 BIOL3307 Biotechnology industry (6 credits)
 BIOL3315 Animal biotechnology (6 credits)
 BIOL3316 Plant biotechnology (6 credits)
 BIOL3317 Microbial biotechnology (6 credits)

Minor in Chemistry (Offered to students admitted to Year 1 in 2010-2011)**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:

- a. To understand and apply the basic concepts of chemistry.
(by means of coursework and laboratory-based learning in the curriculum)
- b. To apply chemistry concepts in other subjects.
(by means of coursework and laboratory-based learning in the curriculum)
- c. 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 and 24 credits advanced level courses)

Impermissible Combination: Major in Chemistry

Required courses (36 credits)**1. Introductory level courses (12 credits)**

12 credits of the following courses:

- CHEM1002 Chemistry: principles and concepts (note 1) (6 credits)
 CHEM1003 Chemistry: the molecular world (6 credits)
 CHEM1009 Basic chemistry (note 1) (6 credits)
 CHEM1401 Fundamentals of organic chemistry (6 credits)

2. Advanced level courses (24 credits)

Any 24 credits of advanced level Chemistry courses (CHEM2XXX or CHEM3XXX level), subject to prerequisite requirements.

Notes:

- 1 CHEM1002 and CHEM1009 are mutually exclusive
-

Minor in Earth Sciences (Offered to students admitted to Year 1 in 2010-2011)**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 and 24 credits advanced level courses)

Impermissible Combination: Major in Earth Sciences

Required courses (36 credits)**1. Introductory level courses (12 credits)**

Any two of the following three courses:

EASC0105 Earth through time (6 credits)

EASC0116 Introduction to physical geology (6 credits)

EASC0118 Blue planet (6 credits)

2. Advanced level courses (24 credits)

Any 24 credits of advanced level Earth Sciences courses (EASC2XXX or EASC3XXX level), subject to prerequisite requirements.

Minor in Ecology and Biodiversity (Offered to students admitted to Year 1 in 2010-2011)**Objectives:**

This minor is an ideal introduction to the natural world, the species and ecosystems it comprises and the biological rules it follows. It aims to allow students to learn about general ecological principles and the local flora and fauna of the region, and the conservation challenges that will need to be addressed in a rapidly-changing world. Students of this minor will then be able to build upon this basic knowledge by selecting from among a wide range of courses that offer learning opportunities through practical and field work, as well as traditional and virtual teaching, in more specialized areas of ecology and biodiversity.

Learning Outcomes:

- a. Appreciate and describe the importance of ecology and biodiversity, and the importance of the variety of life to humans.
(by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- b. Understand and describe the impacts of environmental change and the causes and consequences of biodiversity loss.
(by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- c. Appreciate and describe the ecological principles underlying different policies and plans for biodiversity conservation and sustainable development in Hong Kong and elsewhere.
(by means of coursework, tutorial classes and laboratory-based learning in the curriculum)

Minimum Entry Requirement: NIL**Minimum Credit Requirement:** 36 credits (12 credits introductory level and 24 credits advanced level courses)**Impermissible Combination:** Major in Ecology and Biodiversity***Required courses (36 credits)*****1. Introductory level courses (12 credits)**

At least 12 credits of the following courses:

- BIOL0600 Ecology of Hong Kong (6 credits)
 BIOL0604 Evolutionary diversity (6 credits)
 BIOL0625 Ecology and evolution (6 credits)

2. Advanced level courses (24 credits)

Plus at least 24 credits of the following courses:

- BIOL2606 Environmental microbiology (6 credits)
 BIOL2607 Fish biology (6 credits)
 BIOL2608 Biometrics (6 credits)
 BIOL2610 Biological oceanography (6 credits)
 BIOL2611 Systematics and phylogenetics (6 credits)
 BIOL2612 Conservation ecology (6 credits)
 BIOL2615 Freshwater ecology (6 credits)
 BIOL2617 Coastal ecology (6 credits)
 BIOL2619 Terrestrial ecology (6 credits)
 BIOL2621 Plant structure and evolution (6 credits)
 BIOL2622 The biology of marine mammals (6 credits)
 BIOL3622 Ecological impact assessment (6 credits)

Minor in Environmental Protection (Offered to students admitted to Year 1 in 2008-2009)**Objectives:**

Managing and conserving the environment is increasingly recognized as an important and necessary challenge for modern Society. Preserving biological diversity, whether species, genes, populations or ecosystems, requires an understanding of a range of exciting new areas in the life sciences. This Minor will provide students with an appreciation of the depth and breadth of this important developing field. The lectures are enhanced by valuable laboratory and practical experience that should be applicable to a wide range of careers, and contribute to a better understanding of the world we live in.

Learning Outcomes: NIL

Minimum Entry Requirement: AL or AS Chem. or equivalent or a pass in CHEM0004 Fundamental chemistry (note 1) / CHEM0008 Fundamental chemistry

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

Impermissible Combination: Major in Environmental Protection

Required courses (36 credits)

1. Introductory level courses (12 credits)

CHEM1007 Basic chemistry for biological sciences (note 1) OR CHEM1009 Basic chemistry (6 credits)

Plus at least 6 credits of the following courses:

BIOL0601 Ecology of Hong Kong (note 2) (3) OR BIOL0600 Ecology of Hong Kong (6 credits)

BIOL0603 Ecology and evolution (note 1) (3) OR BIOL0625 Ecology and evolution (6 credits)

EASC0118 Blue planet (6 credits)

Alternative courses possible in the case of students taking Majors/Minors with an overlap of core courses:

BIOL0605 Ecology field course (note 2) (3 credits)

CHEM1003 Chemistry: the molecular world (6 credits)

EASC0120 Earth, environmental and society (6 credits)

2. Advanced level courses (24 credits)

CHEM2103 Chemical process industries and analysis (6 credits)

Plus at least 18 credits of the following courses:

BIOL2610 Biological oceanography (6 credits)

BIOL2612 Conservation biology OR Conservation ecology (6 credits)

BIOL2614 Environmental toxicology (6 credits)

BIOL2615 Freshwater ecology (6 credits)

BIOL2617 Coastal ecology (6 credits)

BIOL3621 Fisheries and mariculture (6 credits)

BIOL3622 Environmental impact assessment OR Ecological impact assessment (6 credits)

BIOL3624 Environmental monitoring and remediation techniques (6 credits)

CHEM2102 Environmental chemistry (6 credits)

CHEM2202 Chemical instrumentation (6 credits)

CHEM2207 Food and water analysis (6 credits)

EASC2126 Mineralogy and geochemistry (6 credits)

EASC2128 Earth-ocean-atmosphere interactions resources (6 credits)

EASC3132 Earth resources (6 credits)

Notes:

1 Not available in 2009-2010 or thereafter.

2 Not available in 2010-2011 or thereafter.

Minor in Food and Nutritional Science (Offered to students admitted to Year 1 in 2010-2011)

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 and 24 credits advanced level courses)

Impermissible Combination: Major in Food and Nutritional Science

Required courses (36 credits)**1. Introductory level courses (12 credits)**

BIOL1514 Nutrition and metabolism (6 credits)

BIOL1528 Food chemistry (6 credits)

2. Advanced level courses (24 credits)

At least 24 credits of the following courses:

BIOL2218 Human physiology (6 credits)

BIOL2302 Fermentation technology (6 credits)

BIOL2503 Grain production and utilization (6 credits)

BIOL2507 Meat and dairy science (6 credits)

BIOL2515 Food microbiology (6 credits)

BIOL2529 Food and nutritional toxicology (6 credits)

BIOL2530 Molecular biology and nutrigenomics (6 credits)

BIOL2531 Principles of Chinese medicinal diet (6 credits)

BIOL2532 Diet and disease (6 credits)

BIOL2533 Nutrition and life cycle (6 credits)

BIOL2534 Nutrition and public health (note 1) (6 credits)

BIOL2535 Food processing and engineering laboratory course (6 credits)

BIOL2536 Food and nutrients analysis laboratory course (6 credits)

BIOL3527 Food safety and quality management (6 credits)

BIOL3538 Food product development (6 credits)

BIOL3540 Diet, brain function and behaviour (6 credits)

Notes:

1 Not offer in 2010-2011.

Minor in General Science (Offered to students admitted to Year 1 in 2010-2011)**Objectives:**

Science is an indispensable component of this modern world, with a significant impact to our daily lives. Be it the interaction between animals and their natural environment, the food in our daily diet, the synthesis of new materials (nanomaterials, polymeric and semiconducting materials), the mystery of the

human gene, or the application of mathematics to solve problems. This Minor is suitable for non-Science students who are interested in exploring science and learning how scientists study the real world. The scientific knowledge, quantitative reasoning, logical and analytical thinking and sense of numeracy will be useful in various fields of finance, business, social sciences, arts and education. Students have the flexibility to gather courses in any area of interest.

Learning Outcomes: NIL

Minimum Entry Requirement: NIL

Minimum Credit Requirement: 36 credits (12 credits introductory level and 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 and 1), subject to prerequisite requirements.

2. Advanced level courses (24 credits)

At least 24 credits of any advanced level Science courses (level 2 and 3), subject to prerequisite requirements.

Minor in Global Climate Change (Offered to students admitted to Year 1 in 2010-2011)

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:

- a. To recognize, explain and connect the basic principles, concepts, theories, pertaining to the global climate change debate using appropriate scientific language.
(by means of coursework, tutorial and laboratory-based learning in the curriculum)
- b. To describe and interpret the evolution of Earth's climate system.
(by means of coursework, tutorial and laboratory-based learning in the curriculum)
- c. To communicate, analyze and explain the past and possible future effects of global climate change on Earth's inhabitants.
(by means of coursework, tutorial and laboratory-based learning in the curriculum)
- d. To describe and compare anthropogenic and natural factors responsible for climate change at different timeframes.
(by means of coursework, tutorial and laboratory-based learning in the curriculum)

Minimum Entry Requirement: NIL

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

Impermissible Combination: NIL (note 1)

Required courses (36 credits)

1. Introductory level courses (12 credits)

EASC0122 Introduction to climate science (6 credits)

Plus at least 6 credits from the following courses:

- BIOL0625 Ecology and evolution (6 credits)
- EASC0105 Earth through time (6 credits)
- EASC0118 Blue planet (6 credits)
- PHYS0629 Weather and climate (6 credits)

2. Advanced level courses (24 credits)

At least 24 credits of advanced level Earth Sciences courses (EASC2XXX or EASC3XXX) including:

- EASC2127 Global change: anthropogenic impact (6 credits)
- EASC2131 A cool world: ice ages and climate change (6 credits)

Plus at least 12 credits from the following courses:

- BIOL2610 Biological oceanography (6 credits)
- BIOL2612 Conservation biology (6 credits)
- CHEM2102 Environmental chemistry (6 credits)
- EASC2005 Meteorology (6 credits)
- EASC2112 Earth systems (6 credits)
- EASC2128 Earth-ocean-atmosphere interactions (6 credits)
- EASC2129 Physical oceanography (6 credits)
- EASC2130 Earth observation and remote sensing (6 credits)

Notes:

- 1 For students having major / minor combination of Earth Sciences / Global Climate Change, any single introductory or advanced level Earth Sciences course can be used to satisfy a major or minor requirement only once.

Minor in Mathematics (Offered to students admitted to Year 1 in 2010-2011)

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: (note 1)

1. HKCEE Additional Mathematics and AS Mathematics and Statistics; or
2. AL Pure Mathematics; or
3. a pass in MATH0201 Basic calculus (for those with HKCEE Math only) or a pass in MATH1804 University mathematics A (for those with AS Math and Stat only)

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

Impermissible Combination: Major in Mathematics; Mathematics/Physics

Required courses (36 credits)

1. Introductory level courses (12 credits) (note 2)

MATH1111 Linear algebra (6 credits)

Plus one of the following courses:

MATH1211 Multivariable calculus (6 credits)

MATH1805 University mathematics B (6 credits)

MATH1813 Mathematical methods for actuarial science (6 credits)

2. Advanced level courses (24 credits)

Any 24 credits of advanced level Mathematics courses (MATH2XXX or MATH3XXX or MATH6XXX level), subject to prerequisite requirements.

Notes:

- 1 Students with different mathematics background must consult the Department of Mathematics for advice on the bridging courses.
- 2 Students are strongly advised to take also MATH1001.

Minor in Microbiology (Offered to students admitted to Year 1 in 2010-2011)

Objectives:

The aim of this minor is to provide students with a stimulating, valuable and enjoyable learning experience in microbiology, a key life science discipline for the 21st century. Microbiology lies at the heart of understanding human health and disease, environmental processes and protection and advances in biotechnology and industrial microbiology. The curriculum places a strong emphasis on modern molecular approaches and analytical techniques. Core courses provide training in fundamental scientific skills and students also have the flexibility to choose 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 selected concepts and advances in microbiology including: the evolution and diversity of microbial life, microbial physiology, the occurrence and role of microorganisms in natural environments, the role of microorganisms in disease and medicine, food production and spoilage, plus their applications in biotechnology.
(achieved through lectures and interactive learning experiences)
- b. Students will develop an understanding of broader scientific concepts, and be able to relate these to scientific issues of significance in their daily lives and also of more global significance.
(achieved through lectures and interactive learning experiences)
- c. Students will develop their skills in critical thinking and the ability to recognize real-world situations where they may apply these skills.
(achieved through problem-based learning experiences)
- d. Students will improve their oral and written communication skills, and gain confidence in interacting with their peers and professors individually and as part of a team.
(achieved through interactive learning experiences)

Minimum Entry Requirement: AL Biology or equivalent, or a pass in BIOL0126 Fundamentals of biology

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

Impermissible Combination: Major in Microbiology

Required courses (36 credits)

1. Introductory level courses (12 credits)

12 credits of the following courses:

BIOL0135 Introductory microbiology (6 credits)

BIOL1125 Introduction to biochemistry OR BIOC1001 Basic biochemistry (6 credits)

BIOL1133 Biological science laboratory course (6 credits)

2. Advanced level courses (24 credits)

At least 12 credits of the following courses:

BIOL2111 Molecular microbiology (6 credits)

BIOL2205 Immunology (6 credits)

BIOL2303 Molecular biology (6 credits)

BIOL2324 Microbial physiology and biochemistry (6 credits)

Plus at least 12 credits of the following:

BIOL2515 Food microbiology (6 credits)

BIOL2606 Environmental microbiology (6 credits)

BIOL3219 Clinical microbiology and applied immunology (6 credits)

BIOL3317 Microbial biotechnology (6 credits)

Minor in Physics (Offered to students admitted to Year 1 in 2010-2011)

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:

- a. 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)
- b. Students should be able to analyze some physics problems qualitatively and quantitatively.
(by means of coursework, tutorial classes and laboratory works in the curriculum)
- c. 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 PHYS0625 Physics by inquiry or equivalent

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

Impermissible Combination: Major in Mathematics/Physics; Physics

Required courses (36 credits)**1. Introductory level courses (12 credits)**

PHYS1417 Basic physics (6 credits)

Plus at least 6 credits of introductory level Physics course (PHYS0XXX or PHYS1XXX level) (note 1)

Or

PHYS1414 General physics I (6 credits)

PHYS1415 General physics II (6 credits)

2. Advanced level courses (24 credits)

Any 24 credits of advanced level Physics courses (PHYS2XXX or PHYS3XXX or PHYS6XXX level), subject to prerequisite requirements.

Notes:

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

- 1 Students are strongly advised to take at least one of the following courses: PHYS1414 or PHYS1415 to allow for maximum flexibility in course selection for advanced level Physics courses.

Minor in Risk Management (Offered to students admitted to Year 1 in 2010-2011)**Objectives:**

The Risk Management minor aims to provide interested students with basic concepts of risk management and fundamental skills of employing various statistical techniques for managing risk. The minor curriculum is particularly designed for students from different majors to enhance their interest in Risk Management or to complement their major of study.

Learning Outcomes:

- a. Students would acquire basic understanding and identify the generic risk management issues and techniques.
(by means of coursework, tutorial classes and project-based learning in the curriculum)
- b. Students would be able to apply elementary methods and models for risk assessment and management.
(by means of coursework, tutorial classes and project-based learning in the curriculum)
- c. Students would be able to acquire and interpret relevant data and information for risk management.
(by means of coursework, tutorial classes and project-based learning in the curriculum)

Minimum Entry Requirement: NIL

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

Impermissible Combination: Major in Risk Management

Required courses (36 credits)**1. Introductory level courses (12 credits)**

One of the following courses:

STAT0301 Elementary statistical methods (6 credits)

STAT1301 Probability and statistics I (6 credits)

STAT1306 Introductory statistics (6 credits)

STAT0302 Business statistics (6 credits)

Alternative courses possible in the case of students taking Major/Minor in Statistics with an overlap of core courses:

Any 6-credit advanced level statistics courses (STAT2XXX or STAT3XXX level)

Plus at least 6 credits of the following courses:

- STAT1302 Probability and statistics II (6 credits)
 STAT1303 Data management (6 credits)

One of the advanced level courses listed below (6 credits)

2. Advanced level courses (24 credits)

At least 24 credits of the following courses:

- STAT2309 The statistics of investment risk (6 credits)
 STAT2310 Risk management and insurance (6 credits)
 STAT2311 Computer-aided data analysis (6 credits)
 STAT2312 Data mining (6 credits)
 STAT2314 Business forecasting (6 credits)
 STAT2315 Practical mathematics for investment (6 credits)
 STAT3301 Time-series analysis (6 credits)
 STAT3303 Derivatives and risk management (6 credits)
 STAT3320 Risk management and Basel II in banking and finance (6 credits)
 STAT3321 Credit risk analysis (6 credits)
 STAT3322 Market risk analysis (6 credits)

Minor in Statistics (Offered to students admitted to Year 1 in 2010-2011)

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:

- 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)
- Students would be equipped with computational skills essential to conducting complete data analyzes.
(by means of coursework, tutorial classes, project-based learning and presentation opportunities in the curriculum)
- 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 analyzes.
(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 and 24 credits advanced level courses)

Impermissible Combination: Major in Statistics

Required courses (36 credits)

1. Introductory level courses (12 credits)

One of the following courses:

- STAT0301 Elementary statistical methods (6 credits)
 STAT0302 Business statistics (6 credits)
 STAT1301 Probability and statistics I (6 credits)
 STAT1306 Introductory statistics (6 credits)

Plus at least 6 credits of the following courses:

- STAT1302 Probability and statistics II (6 credits)
- STAT1303 Data management (6 credits)
- STAT1304 Design and analysis of sample surveys (6 credits)

Alternative courses possible in the case of students taking Major/Minor in Risk Management with an overlap of core courses:

Any 6-credit advanced level statistics courses (STAT2XXX or STAT3XXX level)

2. Advanced level courses (24 credits)

At least 24 credits of the following courses:

- STAT2301 Linear statistical analysis (6 credits)
- STAT2302 Statistical inference (6 credits)
- STAT2303 Probability modelling (6 credits)
- STAT2304 Design and analysis of experiments (6 credits)
- STAT2305 Quality control and management (6 credits)
- STAT2306 Business logistics (6 credits)
- STAT2307 Statistics in clinical medicine and bio-medical research (6 credits)
- STAT2308 Statistical genetics (6 credits)
- STAT2311 Computer-aided data analysis (6 credits)
- STAT2312 Data mining (6 credits)
- STAT2313 Marketing engineering (6 credits)
- STAT2314 Business forecasting (6 credits)
- STAT3301 Time-series analysis (6 credits)
- STAT3302 Multivariate data analysis (6 credits)
- STAT3304 Computer-aided statistical modelling (6 credits)
- STAT3306 Selected topics in statistics (6 credits)
- STAT3316 Advanced probability (6 credits)
- STAT3317 Computational statistics (6 credits)
- STAT3811 Survival analysis (6 credits)

Candidates admitted to this programme could refer to Elective Courses Section offered by other Faculties and Centres.