FACULTY OF SCIENCE

Department of Biochemistry

BIOC1001 Basic biochemistry (6 credits)

This course is designed to present an overview of biochemistry and to provide an understanding of the basic mechanisms underlying life processes. It is an independent course which can be taken by students from various disciplines. The course also prepares students for further studies in Biochemistry and Molecular Biology.
Prerequisite AS Biology or AS Chemistry

BIOC1003 Introduction to molecular genetics (6 credits)

The objectives of this course are to provide students with basic and up-to-date knowledge on the structures and functions of nucleic acids, to give students a general picture of the molecular process of gene expressions, and to introduce students to recombinant DNA technology.
Prerequisite AS Biology or AS Chemistry

BIOC2601 Metabolism (6 credits)

This course aims to provide the basic concepts of metabolism: the events and their importance in relation to the survival of living organisms. Taken together with BIOC1001 and BIOC2602, this will lay the foundation for the more advanced courses offered in the Biochemistry discipline.
Prerequisite BIOC1001

BIOC2602 Understanding metabolic diseases (6 credits)

To widen and deepen knowledge and understanding of metabolism. By using a problem-based learning (PBL) approach, students are trained in critical thinking and problem-solving skills. Students will be able to grasp the major effects on metabolic integration and control and they can use these concepts with greater confidence and success in approaching new problems and new areas of study.
Prerequisite BIOC1001
Co-requisite BIOC2601

BIOC2603 Principles of molecular genetics (6 credits)

To provide basic knowledge on molecular genetics, illustrating modern concepts with current experimental approaches and computer-assisted programmes. Together with BIOC3613 and BIOC3609 taken in the second year, a comprehensive background is provided for advanced study and/or research in molecular biology.
Prerequisite BIOC1001 or BIOC1003 or BIOL1102 or BIOL1122 or BIOL1125 or BIOL1106

BIOC2604 Essential techniques in biochemistry and molecular biology (6 credits)

To give students a general overview of different experimental approaches and model systems, and to provide students with hands-on experience in basic biochemical and molecular techniques.
Prerequisite BIOC1001 or BIOC1003 or BIOL1102 or BIOL1122 or BIOL1125 or BIOL1106

BIOC2616 Directed studies in biochemistry (6 credits)

To enhance the student's knowledge of a particular topic and the student's self-directed learning and critical thinking skills.
Prerequisite Major in Biochemistry and at least 18 credits of introductory-level courses in Biochemistry. Not to be taken concurrently with BIOC3614.

BIOC3608 Introduction to bioinformatics (6 credits)

This course will examine existing programs and services available on the World Wide Web for DNA and protein sequence analysis. Students will also learn how to use the sequence analysis EMBOSS package installed locally. The underlying principles of these analysis programs and services will be presented. Students will learn how to retrieve, analyze, and compare protein and DNA sequence similarities. A basic introduction to protein modeling will also be presented.
Prerequisite BIOC2603 or BIOL2303 or BIOL3308

BIOC3609 Molecular medicine * (6 credits)

To provide up-to-date knowledge of the molecular and genetic basis of human diseases including cancer, thereby preparing the students for a career in medical molecular biology, biotechnological, pharmaceutical and genome research.
Prerequisite BIOC2603 or BIOL2303; basic knowledge of molecular genetics and molecular biology is assumed
* *This course is not available to students taking BIOL3308 Applied Molecular Biology and/or BIOL3213 Advanced Techniques and Instrumentation in Animal Biology.*

BIOC3610 Advanced biochemistry I (6 credits)

This is part of the advanced series designed to bring students to the understanding of current concepts, physicochemical bases and techniques in modern Biochemistry. The aim is to help students to develop critical thinking and analytical skills thus equipping them for beginning research projects or professional training in biomedical sciences.
Prerequisite 1) BIOC1001; and 2) BIOL2301; and 3) BIOC2601 or BIOL2115

BIOC3611 Advanced biochemistry II (6 credits)

This is part of the advanced series designed to bring students to the understanding of current concepts, physicochemical bases and techniques in modern biochemistry. Hence to equip them for beginning research projects or professional training in biomedical sciences.
Prerequisite BIOL3610

BIOC3613 Molecular biology of the gene (6 credits)

To provide an up-to-date knowledge of molecular biology, especially with respect to the regulation of eukaryotic gene expression, molecular embryology.
Prerequisite BIOC2603 or BIOL2303 or BIOL3308

BIOC3614 Biochemistry project (12 credits)

To enable students to acquire the basic skills in scientific research: literature search, critical reasoning, communication, teamwork and time management. The course is particularly useful for those students who intend to pursue a career in life science.
Prerequisite BIOC1001 and BIOC2604 and good overall performance in 2nd year courses
Co-requisite BIOC3610, BIOC3611, BIOC3612

BIOC3615 Advanced techniques in biochemistry and molecular biology (6 credits)

This is an advanced experimental-based course for students majoring in Biochemistry and related disciplines. The aim is to provide the necessary training for students to pursuit postgraduate research education and potential employment in a scientific laboratory/industry environment.
Prerequisite 1) BIOC1001; and 2) BIOC0002 or BIOC1003; and 3) BIOC2604

School of Biological Sciences

BIOL0002 Introduction to food and nutritional science (3 credits)

The course enables students to gain an appreciation of the scope of Food Science as a discipline. This is an independent course which can be taken by students from various disciplines. It also prepares students for further studies in Food and Nutritional Science.
Prerequisite Nil

BIOL0118 Bioethics (6 credits)

The aim is to explore the ethical implications of the latest major advances in biology and medicine.
Prerequisite Nil

BIOL0120 The gene * (3 credits)

The objective of the course is to expose students to the impacts of gene to the modern society. With the completion of the human genome in the next three years not only promises a better quality of life, it also brings lots of technical and ethical issues that the general public need to deal with. The goal of the course is designed to open up students from all backgrounds to this basic unit of inheritance called gene and its impact on various other scientific and social disciplines. Outline includes but not limited to the chemical basis of gene, gene evolution, gene chips, animal cloning, gene and disease, human genome and computer science, gene and behavior, genetic implications to law and society.
Prerequisite Nil (not offered to students with AL Biology)
* *Students with a pass in AL / AS Biology or who are in the Biology, Biochemistry, Animal and Plant Biotechnology, Biotechnology, Environmental Life Science, and Food and Nutritional Science programmes / major and who are taking or have taken YSCN0004 are not allowed to take this course.*

BIOL0126 Fundamentals of biology * (6 credits)

This course is designed to provide students a general concept of the various disciplines of experimental biology and prepare them for further intermediate and advanced courses in biology. It takes a systematic approach to look at the key principles that govern the survival of life forms. The course is opened to those who wish to take a minor in Biology or General Science but do not have A-level biology.
Prerequisite HKCEE Biology
* *Students who have passed HKAL Biology should take BIOL1122 Fundamental Biology. This course is not available to students who have taken BIOL1122 or any level 2 and level 3 biology courses.*

BIOL0127 Contemporary nutrition: insights and controversies * (3 credits)

What you eat greatly affects your well-being, and this is especially true in recent years when nutrition has become one of the hottest topics in town for men and women of all ages. What food is good for our health? How much do we need to eat? Which dietary plan is scientifically sound and effective? Everywhere we go, we are bombarded by different messages, from vitamins to functional food products, on how food components or treatments impact on body functions and health. How reliable is the information from the mass media? Are these facts or myths? This course aims to provide health conscious individuals with fundamental knowledge to decipher information related to nutrition and health. Such knowledge is vital to everyone not just in a trendy fashion or for a short term dietary plan, it is essential to the building of good eating habits that could promote health for a lifetime.
Prerequisite Nil
* *Not for students in the Food and Nutritional Science programme, major or minor.*
Not for students who have taken BIOL1514.

BIOL0128 Biological techniques, instrumentation and data processing (6 credits)

This course is designed to provide students with a wide range of basic biological techniques, principles of instruments and data processing. Basic concepts in protein/DNA purification including precautions, detection and verification of purified products are included. The course is also opened to those who wish to take a major or a minor in Biology for General Science.
Prerequisite HKCEE Biology or equivalent

BIOL0129 Introductory microbiology (3 credits)

The course will provide an introduction to the microbial diversity of life on earth including bacteria, fungi, microalgae, viruses, and other microorganisms. Emphasis will be placed on organisms that are of importance in our everyday lives. The course will provide an essential foundation for all biology students, as an understanding of the role and uses of microorganisms is a basic requirement of most biological subjects. The course leads to various 2nd and 3rd level courses in microbiology.
Prerequisite Nil

BIOL0130 Introduction to the biotechnology industry (3 credits)

Through an introduction to the history and technology of some of the most successful biotechnology companies, students will be able to understand the recent advances in the biotechnology industry.
Prerequisite HKCEE Biology

BIOL0131 Human microbiology (3 credits)

This course will provide an introduction to microbes associated with humans including bacteria, fungi, microalgae, viruses and other microorganisms. Emphasis will be placed on organisms that are of importance in our everyday lives and illustrated with topical examples where possible.
Prerequisite Nil

BIOL0132 Practical microbiology * (3 credits)

To train students in the basic skills of laboratory and field microbiology.
Prerequisite Nil
Co-requisite BIOL1119 or BIOL0129
* *Offered from 2008-2009.*

BIOL0601 (ECOL0020) Ecology of Hong Kong (3 credits)

This course covers the ecology and biodiversity of terrestrial, marine and freshwater environments in Hong Kong
Prerequisite Nil

BIOL0602 (ECOL0036) Origins of life and astrobiology (3 credits)

To consider the origins of life on Earth, what makes a planet habitable and the influence of early life forms on Earth's biosphere. To review evidence for the existence of other habitable planets and the concept that life can be transported across inter-planetary distances. To examine the challenges that face mankind if he is to consider life in space or on other planets.
Prerequisite Nil

BIOL0603 (ECOL0040) Ecology and evolution (3 credits)

This course provides an introduction to how the ecology and behaviour of animals has been shaped by evolution, and demonstrates how we can understand and explain the significance of what we see in nature. The **course objectives** are as follows:

- To explain how the environment affects organisms in terms of their present-day ecology (determining where they live and how many can survive there) and, through natural selection acting over past generations, influences their form and adaptations.
- To introduce the basic principles of ecology and evolution, showing how they are linked to the environment by the phenomenon of adaptation.
- To describe the patterns of interactions among individuals (e.g. mating systems and reproduction, social behaviour, competition, and predation), and explain some of the simple principles that under their occurrence and evolution.

To introduce the concept of biodiversity, how it is generated by adaptive radiation, how it is estimated, and its importance to humans.
Prerequisite Nil

BIOL0604 (ECOL0041) Evolutionary diversity (6 credits)

To provide students with an introduction to the diversity of plant and animal life. Recent research has resulted in fundamental changes in our understanding of evolutionary history (phylogeny). Current evolutionary trees will be used as the basis for a survey of different groups in phylogenetic sequence, and for understanding how structures, processes and behaviours have changed through time.
Prerequisite Nil

BIOL0605 (ECOL0042) Ecology field course (3 credits)

This 5-day residential field course, including lectures and briefing sessions, provides students with an opportunity to visit a variety of habitats in Hong Kong, and to observe directly the main environmental factors that prevail in each of them. Emphasis will be placed on guiding students to become familiar with common local plants and animals and their habitats.
Prerequisite Nil

BIOL1106 Genetics (3 credits)

The objective of the course is to provide an introduction to the various aspects of genetics. At the end of the course students are expected to know the fundamentals of classical, population and molecular genetics.
Prerequisite AL Biology

BIOL1107 Introduction to developmental biology & reproduction (3 credits)

The course is designed to provide an introduction to developmental biology and reproduction animals through an integrated approach. Reproductive and developmental processes will be examined at the cellular and organismic levels.
Prerequisite AL Biology

BIOL1121 Animal form and functions (3 credits)

This is a fundamental course which intends to show the students the major animal life forms on earth and how they can survive in a given environment. The relationships between body forms, body architectures, environmental interactions, functional adaptations and evolution will be illustrated.
Prerequisite AL Biology

BIOL1122 Functional biology * (6 credits)

The course is designed to provide an introduction to modern developments in experimental biology through an integrated approach. Life processes will be examined at the molecular, cellular and organismic level.
Prerequisite AL Biology
* *BIOL0126 and BIOL1122 are mutually exclusive.*

BIOL1123 Food chemistry (3 credits)

The course is designed to give students a basic understanding of chemistry of the major and minor components in food systems.
Prerequisite AL or AS Chemistry

BIOL1125 Introduction to biochemistry * (6 credits)

This course is designed to provide undergraduate (non-biochemistry major) an overview of fundamental concepts in biochemistry as well as hands-on experience in biochemical techniques.
Prerequisite AL or AS Biology
* *Students who passed BIOC1001 Basic Biochemistry are not allowed to take this course.*

BIOL1513 Food science laboratory (3 credits)

The course is designed to introduce students to some basic practical training related to food science and nutrition.
Prerequisite AL or AS Chemistry

BIOL1514 Nutrition and metabolism * (6 credits)

This is an independent course compulsory for students in the Food & Nutritional Science programme, but also opens to students in other life sciences disciplines. The fundamental concepts in nutrition will be introduced. An integrated approach will be used in discussing the interactions between diet and intermediary metabolism.
Prerequisite AL or AS Biology
* *BIOL1514 and BIOL2510 are mutually exclusive.*

BIOL2004 Bioexploitation of filamentous fungi (3 credits)

This course provides and overview of the uses of filamentous fungi in biotechnology, the potential uses of fungal products and the methods by which scientists search for and develop these new products.
Prerequisite BIOL1119 or BIOL0129

BIOL2109 Economic botany * (6 credits)

To provide an understanding of the scientific principles, processes, and practices involved in the utilization of crops and other economics plants. At the end of the course students are expected to be scientifically knowledgeable on the plants and plant products they encounter everyday.
Prerequisite BIOL1101 or BIOL1121 or ECOL0038 or BIOL1102 or BIOL1122
* *Not offered in 2007-2008.*

BIOL2111 Molecular microbiology (6 credits)

This course is intended for biology, biotechnology and biochemistry students who would like to understand the modern fundamentals of microbiology. At the end of the course the students are expected to know the physiological, biochemical and molecular aspects of microbiology.
Prerequisite BIOL1101 or BIOL1121 or ECOL0038 or BIOL1102 or BIOL1122 or BIOL0126 or BIOL1103 or ECOL1103 or ECOL0035

BIOL2112 Plant physiology (6 credits)

To give an understanding of plant processes such as plant growth and development and their regulatory mechanisms.
Prerequisite BIOL1101 or BIOL1121 or ECOL0038 or BIOL1102 or BIOL1122 or BIOL0126

BIOL2114 Plant biochemistry and molecular biology (6 credits)

To present current developments in selected areas of plant biochemistry and plant molecular biology.
Prerequisite BIOL1102 or BIOL1122 or BIOL0126

BIOL2115 Cell biology & cell technology (6 credits)

To provide a coherent understanding of the structure and function of cells, and the principles and applications of cell culture and instrumentation in biology and biotechnology.
Prerequisite BIOL1101or BIOL1121 or ECOL0038 or BIOL1102 or BIOL1122 or BIOL0126 or BIOL1103 or ECOL1103 or ECOL0035 or BIOC1001 or BIOL1125

BIOL2116 Genetics I (6 credits)

This is the first of an integrated pair of courses, Genetics I and Genetics II, aiming to provide balanced coverage of many areas in genetics. The focus of Genetics I is on the basic principles of genetics. Genetics II will cover more advanced topics of modern genetics.
Prerequisite BIOL1101 or BIOL1121 or ECOL0038 or BIOL1102 or BIOL1122 or BIOL0126 or BIOL1103 or ECOL1103 or ECOL0035

BIOL2117 Genetics II (6 credits)

This is the second of an integrated pair of courses, Genetics I and Genetics II, aiming to provide balanced coverage of many areas in genetics. The focus of Genetics I is on the basic principles of genetics. Genetics II covers more advanced topics of genetics.
Prerequisite BIOL1101 or BIOL1121 or ECOL0038 or BIOL1102 or BIOL1122 or BIOL0126 or BIOL1103 or ECOL1103 or ECOL0035

BIOL2201 Neuroscience * (6 credits)

To provide a comprehensive picture of how the nervous system and neurones work in animals both as sensory input, integrator, motor output, and for learning, memory and behavourial patterns.
Prerequisite BIOL1101 or BIOL1121 or BIOL1102 or BIOL1122 or BIOL0126 or BIOL1103 or ECOL1103 or ECOL0035
* *Not offered in 2007-2008*

BIOL2203 Reproduction & Reproductive Biotechnology (6 credits)

To provide comprehensive overview on modern concepts and recent advancements in reproductive biology & biotechnology.
Prerequisite AL / AS Biology (preferably with BIOL0126 or BIOL1107)

BIOL2205 Basic immunology * (6 credits)

To provide a broad understanding of animal immune systems. Topics will also include the application of a variety of immunological methods to research and disease diagnosis.
Prerequisite BIOC1001 or BIOL1125 or BIOL1101 or BIOL1121 or BIOL1102 or BIOL1122 or BIOL0126
* *BIOL2205 Basic Immunology is not available to students taking BIOC2606 Applied Human Biochemistry.*

BIOL2207 Endocrinology (6 credits)

To provide an advanced course on hormones and regulation of metabolism.
Prerequisite BIOC1001 or BIOL1125 or BIOL1101 or BIOL1121 or ECOL0038 or BIOL1102 or BIOL1122 or BIOL0126

BIOL2208 Vertebrate comparative anatomy and palaeontology * (6 credits)

This course provides the anatomical background to comprehend the evolutionary and functional adaptations in vertebrate animals through to the evolution of man. The course will examine both the fossil evidence and the comparison of anatomical structures in existing forms. The course is open to Biological Science students, Geology and Earth Science students and welcome others from non-science curricular.
Prerequisite BIOL1101 or BIOL1121 or BIOL1102 or BIOL1122 or BIOL0126 or BIOL1103 or ECOL1103 or ECOL0035
* *Not offered in 2007-2008.*

BIOL2209 Developmental biology * (6 credits)

The course provides important insights into mechanisms regulating the early stages of animal life and is particularly relevant to the understanding of the functional aspects of body systems.
Prerequisite BIOL1102 or BIOL1122 or BIOL0126 or BIOL1107
* *Not offered in 2007-2008.*

BIOL2210 Evolution (6 credits)

Since Darwin's discovery of evolution by natural selection, the science of evolutionary biology and genetics have developed together during the 20th century, leading to the Modern Synthesis or neo-Darwinism. This course attempts to provide a basic understanding of the modern theory of evolution and the mechanisms that underlie evolutionary changes.
Prerequisite BIOL1106

BIOL2215 Animal physiology (6 credits)

To provide a fundamental understanding on the processes that dictate the functions and activities of living matters with particular references to animals and humans. An integrated approach is emphasized to provide students the perspective on how homeostasis is achieved through the coordination of systems and functions.
Prerequisite BIOC1001 or BIOL1125 or BIOL1101 or BIOL1121 or BIOL1102 or BIOL1122 or BIOL0126

BIOL2217 General parasitology (3 credits)

The course is aimed to provide students with a broad basic knowledge on major aspects of general parasitology. Students will be exposed to the taxonomy of parasites: from protozoa to Platyhelminthes. The lectures will also focus on the growth cycles of parasites, their means of infection, reproductive strategies and the host-parasite interactions.
Prerequisite BIOL1101 or BIOL1121 or ECOL0038 or BIOL1102 or BIOL1122 or BIOL0126 or BIOL1103 or ECOL1103 or ECOL0035

BIOL2301 Protein structure and function * (6 credits)

To provide students with a good understanding of protein structure, how structure subserves function, and the methods for study of both. This course provides a strong foundation for advanced courses in biochemistry and biotechnology.
Prerequisite BIOC1001 or BIOL1125 or BIOL1102 or BIOL1122 or BIOL0126
* *The Department of Biochemistry also contributes to the teaching of the course.*

BIOL2302 Fermentation technology (6 credits)

To introduce the key concepts and principles involved in fermentation technology, and discuss how fermentation technology is used in the food and biotechnology industries.
Prerequisite BIOL1102 or BIOL1122 or BIOL0126 or BIOL1105 or BIOL1123 or BIOL1119 or BIOL0129

BIOL2303 Introduction to molecular biology (6 credits)

To provide students with basic knowledge in molecular biology and gene cloning techniques with emphasis on manufacturing of cell products. This course will give Biology students a complete picture of the recent developments and applications in gene technology and prepare biotechnology students for further advanced course in genetic engineering.
Prerequisite BIOL1101 or BIOL1121 or ECOL0038 or BIOL1102 or BIOL1122 or BIOL0126

BIOL2318 Biological sciences field course (6 credits)

This course is offered as a capstone requirement, and provides an experiential learning experience. The component of the course requires intense study of a topic during a field course, inside or outside Hong Kong.
Prerequisite Nil

BIOL2319 Biological sciences internship (6 credits)

This course is offered as a capstone requirement, and is an experiential learning experience. The component includes a period of internship with a member of staff normally over the summer vacation. The student will be given a project or various tasks to perform as instructed by the member of staff. Please contact the course coordinator for details.
Prerequisite Nil

BIOL2320 Directed studies in biological sciences (6 credits)

Students will undertake a dissertation on an agreed topic in biological sciences. The student will develop scientific writing and presentation skills, and will make extensive use of IT and library resources.
Prerequisite Requires completion of relevant level 1 courses

BIOL2501 Food processing and preservation (6 credits)

An introduction to the basic principles and methodology of food processing and preservation technology with emphasis on major methods including high and low temperature processing, concentration and dehydration, and food packaging.
Prerequisite BIOL0002 or BIOL1105 or BIOL1123

BIOL2502 Food technology * (6 credits)

This course is intended for students planning to enter the food industry. This course offers an introduction to physical and engineering principles relevant to the food industry, and an in-depth analysis of selected methods and problems in food processing and preservation.
Prerequisite BIOL0002 or BIOL1105 or BIOL1123
** Not offered in 2007-2008.*

BIOL2503 Grain production & utilization (6 credits)

To provide a broad understanding of the utilization and significance of the major grains in the food industry and in human health and nutrition.
Prerequisite BIOL0002 or BIOL1102 or BIOL1122 or BIOL1105 or BIOL1123

BIOL2505 Food safety and quality management (6 credits)

To provide exposure to some key management concepts used to produce safe high-quality food products that will succeed in the marketplace. To introduce students to the use of the business case-study method in individual, team and class-based learning.
Prerequisite BIOL0002 or BIOL1105 or BIOL1123

BIOL2507 Meat and dairy science (6 credits)

To provide a broad understanding on modern practice and technology of meat and dairy production, processing and marketing.
Prerequisite BIOL1102 or BIOL1122 or BIOL0126 or BIOL1105 or BIOL1123

BIOL2515 Food microbiology (6 credits)

This course provides the key concepts and principles of food microbiology with special emphasis on the interaction between microorganisms and food. Microbial food production, microbial food spoilage and foodborne diseases will be discussed in detail.
Prerequisite BIOL0002 or BIOL1105 or BIOL1123

BIOL2517 Food analysis (3 credits)

To introduce the key concepts in professional food analysis in an industry context. To discuss the choice of analytical methods and the interpretation of results. Major instrumental techniques used in food analysis will be covered.
Prerequisite BIOC1001 or BIOL1125 or BIOL1104 or BIOL0128 or BIOL1122 or BIOL0126 or BIOL1123

BIOL2518 Laboratory in nutritional science (3 credits)

To provide students a comprehensive training on laboratory techniques, experimental approaches and the use of different model systems in nutritional sciences. This course aims to equip students with the basic skills in conducting nutritional studies.
Prerequisite BIO1514

BIOL2519 Essential nutrients & functional foods * (6 credits)

The course has two interrelated parts. First, the functional roles of essential micronutrients in physiologic and metabolic processes will be presented. Second, the concept of functional foods and their role in disease risk reduction will be discussed. The course would appeal to students who have interest in the science, marketing and regulatory aspects of health foods and dietary supplements.
Prerequisite BIOL1514
* *Not for students who have taken BIOL3511.*

BIOL2520 Food toxicology (3 credits)

To provide an understanding of the basic concepts of toxicology and to discuss the major types of toxins and food contaminants found in food and food handling processes.
Prerequisite BIOL1105 or BIOL1123

BIOL2521 Food engineering (6 credits)

This course is intended for students planning to enter the food industry. This course offers an introduction to physical and engineering principles relevant to the food industry, and an in-depth analysis of selected methods and problems in food processing and preservation.
Prerequisite BIOL0002 or BIOL1105 or BIOL1123

BIOL2606 (ECOL2004) Environmental microbiology (6 credits)

To familiarize students with the role of microorganisms in natural processes which affect our environment such as the recycling of chemical elements, interactions with plants and animals, and the ways in which they carry out biodegradation of environmentally important pollutants. Key concepts are illustrated with local case studies and practical classes.
Prerequisite BIOL1119 or BIOL0129

BIOL2607 (ECOL2005) Fish biology (6 credits)

To acquaint students with the principles governing interrelationships among fishes as well as with the biotic and abiotic aspects of their environment thereby to provide an understanding of the factors determining species population dynamics and multispecies interactions. Special emphasis will be placed on coral reef assemblages with an introduction to local reef fishes.
Prerequisite BIOL1121 or BIOL0603 (ECOL0040) or BIOL0604 (ECOL0041)

BIOL2608 (ECOL2006) Biometrics (6 credits)

To introduce students to experimental design and statistical data analysis at an elementary to intermediate level, with an emphasis on practical applications of statistical methods to experimental and observational data in biology and ecology. A range of topics will be addressed, particularly those involving descriptions of populations and communities, biodiversity, ecophysiology and ecological impacts associated with pollution. To illustrate each statistical method, examples will be drawn from real cases, with consideration of the biological or ecological background of the problem and appropriate experimental design, statistical analysis and interpretation. Use will be made of statistical software such as SPSS, SAS and PRIMER for statistical computing. SPSS is powerful and easy to use, and available on HKU networked computers. Computer laboratories will be organised to familarise students with statistical computation using the software.
Prerequisite BIOL0603 (ECOL0040)

BIOL2609 (ECOL2007) Molecular ecology (6 credits)

To familiarize students with the molecular aspects of evolution, populations and conservation. To review case studies where molecular data has solved ecological questions. To provide students with practical training in molecular techniques useful in ecology and environmental science.
Prerequisite BIOL1103 or ECOL1103 or ECOL0035 or BIOL1106 or BIOL0604 (ECOL0041)

BIOL2610 (ECOL2011) Biological oceanography (6 credits)

This course provides an introduction to the physical, chemical, geological and biological processes that occur in oceans. The emphasis is on how marine organisms interact with each other and with their environment by considering various ecosystems. Specific examples from South East Asia, the South China Sea and Hong Kong will be included.
Prerequisite BIOL1101 or BIOL1121 or ECOL0038 or BIOL1103 or ECOL1103 or ECOL0035 or BIOL0603 (ECOL0040) or BIOL0604 (ECOL0041) or BIOL0605 (ECOL0042) or EASC0105 or EASC0116 are preferred

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BIOL2611 (ECOL2013) Systematics & phylogenetics (6 credits)

To give students an understanding of the principles of systematics and phylogenetics and an appreciation of current trends and controversies. Systematics forms an invaluable grounding for many fields of biology (including anatomy, ecology, population biology and evolutionary biology), and enables the integration of a wide range of techniques (including anatomy, biochemistry, chemistry, molecular biology, cytology, palaeontology and ethology).
Prerequisite BIOL1101 or BIOL1121 or ECOL0038 or BIOL0604 (ECOL0041)

BIOL2612 (ECOL2014) Conservation biology (6 credits)

To introduce students to the theory and practice of biological conservation.
Prerequisite BIOL1101 or BIOL1121 or ECOL0038 or BIOL1103 or ECOL1103 or ECOL0035 or BIOL0604 (ECOL0041)

BIOL2613 (ECOL2015) Fungal diversity (6 credits)

To study the spectacular diversity of fungi and their roles in the environment. Fungi are extremely important in most of earth's processes and have developed interesting adaptations and forms. This course will examine the diversity and forms that fungi have taken and explore some of their unique roles in our environment. This course qualifies as a capstone experience.
Prerequisite BIOL1119 or BIOL0129

BIOL2614 (ECOL2016) Environmental toxicology (6 credits)

To introduce students to the basic principles of environmental and ecological toxicology. Specific cases from the current literature will be used and analyzed. Emphasis will be on aquatic ecosystems.
Prerequisite BIOL1103 or ECOL1103 or ECOL0035 or BIOL2606 (ECOL2004) or CHEM1001

BIOL2615 (ECOL2023) Freshwater ecology (6 credits)

Introduce, illustrate and explain the physical and biological processes that occur in drainage basins, their importance to human populations and biodiversity, and the impacts and management of freshwater resources subject to multiple uses. Examples from the Mekong River Basin and/or Hong Kong to human dependence on freshwater ecosystems and the important role that they play in sustaining livelihoods in Asia.
Prerequisite BIOL0601 (ECOL0020), BIOL0603 (ECOL0040) and BIOL0604 (ECOL0041) are preferred

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BIOL2616 (ECOL2024) Plant structure and evolution (3 credits)

To survey the form and function of the vascular plant body, with particular emphasis on the evolutionary significance of various structures. This forms a basis for understanding plant physiology, ecology, systematics and phylogeny.
Prerequisite BIOL1101 or ECOL0038 or BIOL0604 (ECOL0041)

BIOL2617 (ECOL2028) Coastal ecology (6 credits)

To examine the communities of coastal systems: their distribution, composition and the factors which regulate them. This course will examine, using an experimental approach, patterns exhibited by a range of shores and the deterministic and stochastic processes that create and sustain them. Hong Kong shores will be used as examples but comparisons will be drawn from the coastlines of the world.
Prerequisite ECOL2006 or BIOL0603 (ECOL0040) or BIOL0604 (ECOL0041) are preferred

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BIOL2618 (ECOL2029) How humans evolved (6 credits)

This course describes the origins of modern humans through evolution by natural selection. Major topics include tracing our evolution by means of the fossil record; our relationship to monkeys, apes and other primates; and, the main ecological and cultural transformations of our species over time. In short, this course answers the question: **where did we come from?** Emphasis is placed on ultimate causes: why have we evolved to become what we are today? And, what has driven human evolution? Consequences of human dominance of the present-day Earth will be discussed also.
Prerequisite BIOL0603 (ECOL0040) or BIOL0604 (ECOL0041)

BIOL2619 (ECOL2032) Terrestrial ecology (6 credits)

To enable motivated students to acquire the knowledge and skills needed to solve real problems in terrestrial ecology.
Prerequisite BIOL0601 (ECOL0020), BIOL0603 (ECOL0040) and BIOL0605 (ECOL0042)

BIOL2620 (ECOL2044) Extremophiles * (3 credits)

To consider advanced aspects of the following: a) The biodiversity and ecology of extant prokaryotes and eukaryotes in extreme habitats; b) Stress responses to extreme conditions at the cellular level; c) Prokaryotic extremophiles as analogues for early life; d) The application of extremophiles in astrobiology and biotechnology.
Prerequisite BIOC1001 or BIOL1119 or BIOL0129
* *Not offered in 2007-2008.*

BIOL3212 Applied immunology * (6 credits)

A follow-up course of BIOL2205. The aim is to provide the latest knowledge on the practical applications of Immunology in biological research, serodiagnosis and industries.
Prerequisite BIOL2205
* *BIOL3212 Applied Immunology is not available to students taking BIOC2606 Applied Human Biochemistry.*

BIOL3213 Advanced techniques and instrumentation in animal biology * (6 credits)

A follow-up course of BIOL1104/BIOL0128. The aim of this course is to introduce students with the latest techniques and instrumentation used in animal biological research.
Prerequisite 1) BIOL1104 or BIOL0128; and 2) BIOL2303
* *BIOL3213 Advanced Techniques and Instrumentation in Animal Biology is not available to students taking BIOC3609 Molecular Medicine.*
Not offered in 2007-2008.

BIOL3214 General virology (6 credits)

This Course provides the fundamental principles of virology so that students can understand the pathogenesis of major viral diseases that affect animal health. The course will prepare students for profession or graduate work in virology, medicine and biotechnology.
Prerequisite BIOC2603 or BIOC1003 or BIOL2303 or BIOL2205

BIOL3307 The biotechnology industry (6 credits)

This course provides an overview of the various fields of biotechnologies, the development of a biotechnology product, and the operation of biotechnology companies.
Prerequisite BIO2603 or BIOL2303

BIOL3315 Animal biotechnology (6 credits)

This course discusses the key concepts and principles involved in animal biotechnology, and their applications in animal industry and molecular medicine.
Prerequisite BIOC2603 or BIOL2303

BIOL3316 Plant biotechnology (6 credits)

This course covers the principles and applications of plant biotechnology. The significance of plant biotechnology in agriculture and its emerging role in molecular farming for production of biopharmaceuticals and other high-value proteins will be discussed.
Prerequisite BIOC2603 or BIOL2303

BIOL3317 Microbial biotechnology (6 credits)

This course is intended for students who would like to understand the application of modern microbiology in biotechnology. The microbial systems being used include different types of viruses, bacteria, fungi and algae. At the end of the course the students are expected to know the parameters and conditions that affect the yield of production and the systems available for the expression of vaious types of biotechnology products.
Prerequisite BIOC2603 or BIOL2303

BIOL3321 Biological sciences project (12 credits)

To provide experience of biological research by planning and carrying out a small project under the supervision of a member of staff.
Prerequisite Good performance in level 2 courses

BIOL3323 Molecular microbial ecology * (3 credits)

This advanced course focuses upon the recent advances made in environmental phylogenetics and genomics, and demonstrates how molecular datasets have enhanced our understanding of microbial communities in the natural environment.
Prerequisite BIOL2111 or BIOL2606 (ECOL2004)
* *Offered from 2008-2009.*

BIOL3516 Nutrition and brain function (3 credits)

To highlight the impact of nutrient provision on brain function and to discuss various effects of nutrition and diet on mental function and behaviour.
Prerequisite BIOL2215 or BIOL2519

BIOL3522 Nutrigenomics (3 credits)

Recent advances in the understanding of human genes has resulted in the emergence of a new science called Nutrigenomics. This course aims to provide students a basic understanding on the relation between genetic variation and diet-related diseases. A genetically-based nutrition and dietary therapy intervention approach for maintenance of health will be explored.
Prerequisite BIOC1001 or BIOL1125 or BIOL1106 or BIOL2303

BIOL3523 Principles of Chinese medicated diet (3 credits)

To provide basic knowledge on Chinese medicated diet. Illustrating historical and modern concepts of Chinese Medicated diet and encourage research and development with current experimental approaches. This is a valuable course for students in the Food and Nutritional Science programme, but also opens to students in other programmes.
Prerequisite BIOL2519

BIOL3524 Diet and disease (3 credits)

The course deals with diseases associated with diet and basic dietetics.
Prerequisite BIOL1514 and BIOL2519

BIOL3525 Food product development (3 credits)

To introduce the key concepts and techniques used in food product development. Students will work in small groups to design, develop and produce a new food product. Appropriate for students in Food and Nutritional Science Programme or Major.
Prerequisite BIOL2501 or permission of the course coordinator

BIOL3526 Advanced laboratory in nutritional science (3 credits)

This course is a follow-up to BIOL2518. The emphasis will be on human nutrition related techniques. Taken together, the two courses will provide students the necessary knowledge to pursuit postgraduate research education as well as potential employment as a nutritionist in public and private sectors.
Prerequisite BIOL1514 and BIOL2518

BIOL3621 (ECOL3018) Fisheries and mariculture (6 credits)

Theoretical and practical aspects of marine fisheries and mariculture will be covered to provide an understanding of the condition of global and local fishery resources as well as the importance of biological and ecological studies to their management. The role of mariculture in global fish supply will be examined and local fishery and mariculture examples provided.
Prerequisite BIOL2607 (ECOL2005)

BIOL3622 (ECOL3027) Environmental impact assessment (6 credits)

To familiarise students with the principles of Environmental Impact Assessment (EIA), and to examine current pollution problems and their management in Hong Kong. This course is designed to prepare students who are interested in future employment in the environmental sector. Management strategies for pollution monitoring and control will be discussed with special reference to Hong Kong case studies. This course will describe the EIA process in Hong Kong, which will be compared with approaches used in China, the United States and Europe.
Prerequisite BIOL0601 (ECOL0020), BIOL0603 (ECOL0040) and BIOL0605 (ECOL0042)

BIOL3623 (ECOL3030) Environmental remediation * (3 credits)

To introduce the standard parameters in environmental monitoring, the scientific meaning and the practical monitoring techniques used. The focus of the course will be both the field and laboratory analysis, and implement of the monitoring. Local example will be used to illustrate the power of environmental monitoring and identification of the source of pollution.
Prerequisite BIOL1103 or ECOL1103 or ECOL0035 or BIOL2606 (ECOL2004)
***** *Not offered in 2007-2008.*

BIOL3624 (ECOL3034) Environmental monitoring and remediation techniques (6 credits)

To introduce the standard parameters in environmental monitoring, and the scientific basis of practical monitoring techniques. The focus of the course will be on both the analysis and application of new environmental technology. Local examples will be used to illustrate the power of environmental monitoring and identification of pollution sources, as well as the success of implementation of treatment techniques.
Prerequisite BIOL2606 (ECOL2004) or BIOL2614 (ECOL2016)

Department of Chemistry

CHEM0003 Chemistry and daily life * (3 credits)

This general education course is designed as an elective for students in all disciplines and all years without strong chemistry background. It gives an overview of some important chemical aspects that we encounter in our daily life.
Prerequisite Nil (not offered to Chemistry major students)

** Students who are taking or have taken CHEM1101, CHEM1206, CHEM1502, CHEM1506 or YSCN0011 are not allowed to take CHEM0003.*

CHEM0004 Fundamental chemistry * (9 credits)

This course aims at providing students, who are interested in Chemistry, or taking Chemistry as a minor, a foundation course in general chemistry. It covers the essential knowledge of Chemistry on various topics. Students who have taken the course will have a good background to study other courses offered in the Department of Chemistry.

Prerequisite HKCEE Chemistry (students with AS Chemistry should first obtain approval from the department)

** Not available to those who have taken HKAL Chemistry or equivalent, HKU-SPACE Community College Chemistry I or II.*

CHEM1002 Principles and concepts (6 credits)

To provide basic knowledge of modern chemistry. This course is a pre-requisite for the advanced chemistry courses.

Prerequisite AL or AS Chemistry

CHEM1003 The molecular world (6 credits)

To provide students with the basic principles and knowledge of inorganic and organic chemistry and to introduce their relevance to biological processes and materials science. This course provides the foundation for further studies in both inorganic and organic chemistry.

Prerequisite AL or AS Chemistry

CHEM1004 Chemistry: an experimental science I (6 credits)

To cover the principles and applications of basic chemical laboratory techniques. This course is required for Chemistry Majors and highly recommended for Chemistry Minors.

Prerequisite AL or AS Chemistry

CHEM1005 Introduction to materials science (6 credits)

The course provides an introductory and coherent treatment of materials of current importance. It provides physical and chemistry basis for the diverse properties of materials. Materials of the course will be delivered by instructors from both the Physics and Chemistry Departments.

Prerequisite AL or AS Physics
Co-requisite CHEM1002

CHEM1006 Introduction to forensic science (3 credits)

This course is designed as an elective course to provide a basic foundation in the field of forensic science for students with general science or equivalent background. Without having to be major in chemistry, the students are allowed to learn and experience the various methods used in investigating crimes.

Prerequisite AL or AS Chemistry

CHEM1007 Basic chemistry for biological sciences (6 credits)

This course is designed for students who are not Major in Chemistry. It will provide basic knowledge for the understanding of the involvement of chemical principles in processes taking place on biological systems through a number of application studies.
Prerequisite AL or AS Chemistry

CHEM1406 Basic organic chemistry * (6 credits)

To educate the student in the terminology, methodology and problem solving skills appropriate to the study of carbon based molecules in both their academic and practical applications.
This course is a pre-requisite for CHEM2402, Intermediate Organic Chemistry.
Prerequisite AL or AS Chemistry
* *CHEM1401 and CHEM1406 are mutually exclusive.*
Students who planning to take CHEM2402 should take CHEM1406.

CHEM2102 Environmental chemistry (6 credits)

This course introduces students to Environmental Chemistry and enables them to understand the chemical principles involved in various environmental phenomena and processes.
Prerequisite CHEM1001 or CHEM1002 or CHEM1502 or CHEM1506 or CHEM1007

CHEM2103 Chemical process industries and analysis (6 credits)

To familiarize with typical chemical industries important in local and global economy. To understand the technology of chemicals manufacturing and chemical processes in general industry.
Prerequisite CHEM1002 or CHEM1502 or CHEM1506

CHEM2109 Introduction to materials chemistry (6 credits)

This course provides an introduction to materials chemistry. Some basic material characterization techniques will also be introduced. This course is essential for students who wish to take advanced materials course.
Prerequisite CHEM1301 or CHEM1406

CHEM2111 Directed studies in chemistry * (6 credits)

This course is designed for second year students who would like to take an early experience on research. It offers students an opportunity to carry out small scale chemical projects by themselves.
Prerequisite CHEM1002, CHEM1003, CHEM1004, CHEM1206, CHEM1301, CHEM1406, CHEM1506 and CHEM2507 or CHEM2510
* *CHEM2202 Chemical Instrumentation is not available to students who are taking or have taken CHEM2002 Instrumental Chemical Analysis.*

CHEM2202 Chemical instrumentation * (6 credits)

To cover the basic principles and applications of chemical instrumentation. This course aims to provide a good working knowledge, in addition to the principles, of instruments that are commonly used in a chemical laboratory.

Prerequisite CHEM1001 or (CHEM2510 and CHEM1004) or CHEM1201 or CHEM1206
* *CHEM2202 Chemical Instrumentation is not available to students who are taking or have taken CHEM2002 Instrumental Chemical Analysis.*

CHEM2207 Food and water analysis (6 credits)

To cover areas in the application of Analytical Chemistry and new analytical technique development with focus on food and water analysis.
Prerequisite CHEM1206, CHEM2002 or CHEM2202 or CHEM2507 or CHEM2510
Co-requisite CHEM2002 or CHEM2202

CHEM2302 Intermediate inorganic chemistry (9 credits)

This course aims to provide a more detailed treatment of general inorganic chemistry suited to the needs of those intending to extend their studies in chemistry.
Prerequisite CHEM1301 or CHEM1003

CHEM2402 Intermediate organic chemistry (9 credits)

This course is a continuation from Basic Organic Chemistry. Together they provide a solid foundation of organic chemistry.
Prerequisite CHEM1406 or CHEM1003
Co-requisite CHEM2507 or CHEM2510

CHEM2503 Intermediate physical chemistry (9 credits)

This course presents a more detailed treatment of general physical chemistry topics in order to provide a solid foundation for those students intending to extend their studies in chemistry further. This course would stand on its own.
Prerequisite CHEM1502 or CHEM1506 or CHEM1002

CHEM2509 Principles of chemical biology (6 credits)

To understand how to use chemical approaches to emulate biological system to study natural molecules and generate new functional molecules. Useful as an introduction to research in areas of chemical biology, medicinal chemistry and biotechnology.
Prerequisite CHEM1401 or CHEM1406 or BIOC1001

CHEM3105 Chemistry project * (12 credits)

To provide experience of research techniques by working on a short project under the direct supervision of a member of staff. This course would prepare students for graduate school work in chemistry.
Prerequisite 1) CHEM2202; and 2) CHEM2302; and 3) CHEM2402; and 4) CHEM2503
* *Second year students with exceptional academic achievement may also apply for this course.*

CHEM3106 Symmetry, group theory and applications (6 credits)

To introduce the concepts of symmetry and group theory and to apply them in solving chemical problems. This course also provides an introductory treatment of bonding theories, inorganic electronic and vibrational spectroscopy. This course is essential for students who wish to take advanced courses in inorganic chemistry and all types of spectroscopy.
Prerequisite CHEM2302

CHEM3107 Interfacial science and technology (6 credits)

To understand the science and technology of interfacial phenomena and processes often appeared in high value added products and modern technologies.
Prerequisite CHEM2503

CHEM3110 Advanced materials (6 credits)

This course is a continuation from Introduction to Materials Chemistry. It provides a more comprehensive overview on materials chemistry and application of materials in advanced technology. The most recent development in materials chemistry will also be introduced.
Prerequisite CHEM2109

CHEM3203 Analytical chemistry (9 credits)

To cover the principles and methodologies of Analytical Chemistry and its use in the analysis of gas, liquid and solid samples.
Prerequisite CHEM2202 or CHEM2002

CHEM3204 Modern chemical instrumentation and applications (6 credits)

The aim of the course is to provide an understanding of modern instrumentation, covering both fundamental principles and practical aspects of instrument design. The course will be of particular benefit to those pursuing a higher research degree or a career in technical sales/service.
Prerequisite CHEM2202

CHEM3303 Advanced inorganic chemistry (9 credits)

To give further, more detailed, treatment to topics mentioned in Intermediate Inorganic Chemistry and to develop new areas of interest. The course also aims to prepare students for graduate work in inorganic chemistry.
Prerequisite CHEM2302
Co-requisite CHEM3106

CHEM3304 Organometallic chemistry (6 credits)

To give further, more detailed, treatment to organometallic chemistry mentioned in Intermediate Inorganic Chemistry. The course also aims to introduce and familiarize students with advanced laboratory techniques, and to prepare students for graduate work in inorganic and organometallic chemistry.
Prerequisite CHEM2302

CHEM3403 Integrated Organic synthesis (9 credits)

This course covers aspects of modern synthetic methods, develops the concept of synthetic planning, with relevance and in the context of drug synthesis, medicinal chemistry, and bioorganic chemistry, so as to provide an integrated approach to this subject.
Prerequisite CHEM2402

CHEM3404 Advanced organic chemistry (6 credits)

To provide students with knowledge in organic chemistry reaction mechanisms and organic compound structure determination.
Prerequisite CHEM2402

CHEM3405 Organic chemistry of life (6 credits)

To understand molecules and reactions of life sciences. Useful as an introduction to research in areas of bioorganic chemistry, bioinorganic chemistry, medicinal chemistry, and biotechnology.
Prerequisite CHEM1401 or CHEM2402

CHEM3407 Medicinal chemistry (6 credits)

This course covers the chemical principles of drug design and drug action. Useful as an introduction to research in areas of bioorganic chemistry, bioinorganic chemistry, medicinal chemistry, pharmaceutical chemistry, and biotechnology.
Prerequisite CHEM1401 or CHEM2402

CHEM3504 Advanced physical chemistry (9 credits)

This course covers advanced topics in physical chemistry. It is offered for students majoring in physical chemistry and for students who are interested in postgraduate studies.
Prerequisite CHEM2503

CHEM3505 Molecular spectroscopy * (6 credits)

This course provides a unifying treatment of the theories and applications of some important types of spectroscopy. Essential for graduate work in all branches of chemistry.
Prerequisite CHEM2503
* *This course will not be offered in 2007-2008.*

Department of Earth Sciences

EASC0002 Peaceful use of nuclear technologies (3 credits)

To provide students with the basic knowledge on application of nuclear technologies in daily life and to invoke an awareness of current applications of nuclear sciences by case studies.
Prerequisite Nil

EASC0105 Earth through time (6 credits)

To introduce the concepts of geological time and uniformitarianism. To provide an understanding of the fossil record, and the integration of Earth Systems and plate tectonics. To gain an appreciation of our place in the Universe, an understanding of the evolution of Earth and life on Earth through time.
Prerequisite Nil

EASC0117 Geological heritage of Hong Kong (3 credits)

To give an overview of the geology of Hong Kong, potential geological resources for tourism and the role of geology in the development of Hong Kong's infrastructure.
Prerequisite Nil

EASC0118 Blue planet (6 credits)

The course provides an overview of how our diverse and living planet Earth works. To understand the global changes and environmental concerns around us, the course weaves together an understanding of processes in the Earth's lithosphere, hydrosphere, biosphere and atmosphere which constantly interact in interdependent ways with one another making our planet function as an ever-changing dynamic system. The course is intended for students who are taking a first course in Earth Sciences.
Prerequisite Nil

EASC0119 Solid earth (6 credits)

This course provides an overview of the Earth's internal structure, material and internal and external processes.
Prerequisite Nil

EASC0120 Earth, environment and society (6 credits)

This course provides an introduction to global environment and issues and how the Earth's environment affects the well-being of a society.
Prerequisite Nil

EASC0121 Earth's climate past and future (3 credits)

This course provides an introduction to the study of global climate change by investigating the histories of past climates preserved in the geological record. We look at modern research methods that are used in paleoclimatic and paleoenvironmental reconstructions and discuss how this information can be used to model possible climatic trends, such as global warming and the CO_2 budget.
Prerequisite Nil

EASC1122 Physical and chemical properties of the earth (6 credits)

To provide an understanding of chemical and physical principles as they are applied to processes occurring on the Earth.
Prerequisite 1 AL science subject

EASC1123 Planetary geology * (6 credits)

This course provides students with an introduction to the origin, evolution, structure, composition and distribution of matter in the solar system condensed in the form of planets, satellites, comets, asteroids and rings with particular emphasis on surface features, internal structures and history from a geological point of view. The course incorporates the findings from recent space investigations, planetary imagery, remote sensing and Earth analogues to extraterrestrial features into a fascinating portrayal of the geological activities and histories in our Solar System.
Prerequisite 1 AL science subject
* *Offered from 2008-2009.*

EASC2108 Structural geology (6 credits)

The course covers the mechanical properties of rocks and how they are deformed, geological maps and their use in interpreting structure.
Prerequisite EASC0101
Co-requisite EASC0101

EASC2109 Igneous and metamorphic petrology (6 credits)

To provide a comprehensive coverage of the principles and techniques used in the study of igneous and metamorphic rocks and rock-forming processes.
Prerequisite EASC1106

EASC2110 Earth dynamics (6 credits)

To review the concepts and processes that shape the configuration of the Earth, from core to crust.
Prerequisite EASC1106

EASC2112 Earth systems (6 credits)

To provide students who have a fundamental background of Earth Sciences with a more in depth appreciation of the Earth System and the interfaces between its component parts, in order that they might appreciate how informed decisions can be made on the future exploitation and preservation of the planet. To provide a forum for discussion of global issues facing earth scientists.
Prerequisite Nil

EASC2113 Sedimentology (6 credits)

The course deals with sedimentary rocks and processes, and facies models pertaining to various depositional environments.
Prerequisite 1) EASC1106; and 2) EASC0105

EASC2124 Geological maps and air photographs * (6 credits)

This field and class-based course introduces basic field and mapping techniques and the use of geological equipment, and presents an overview of the geology of Hong Kong and vicinity.
Prerequisite EASC0105 or EASC0118 or EASC0119
* *Offered from 2008-2009.*

EASC2125 Global tectonics * (6 credits)

This course is intended to provide students with an understanding of the driving forces of Earth processes and the global outcome of these processes through an examination of direct and indirect observations, the evolution of hypotheses, and critical thinking.
Prerequisite EASC0105 or EASC0118 or EASC0119
* *Offered from 2008-2009.*

EASC2126 Mineralogy and geochemistry * (6 credits)

To provide a coverage of mineralogical principles: as a basis for understanding the petrography of igneous, sedimentary and metamorphic rocks.
Prerequisite EASC0105 or EASC0118 or EASC0119
* *Offered from 2008-2009.*

EASC2127 Global change: anthropogenic impact * (6 credits)

This course will explore the role of humans in global change and the environmental responses to such changes. It will also take a look at human evolution and migration from a paleoenvironmental perspective.
Prerequisite EASC0121, EASC0105 and EASC0118 or EASC0120
* *Offered from 2008-2009.*

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

To examine the complex interactions between geosphere, hydrosphere and atmosphere.
Prerequisite EASC0121, EASC0105 and EASC0118 or EASC0120
* *Offered from 2009-2010.*

EASC2129 Physical oceanography * (6 credits)

To investigate oceans and their dynamics and the processes, which have shaped them. Ocean composition and movement, waves, tides, beaches, interactions with the atmosphere and human exploitation of the non-living resources. To demonstrate how various physical elements of the marine environment interrelate to help form the complex system we know as the world's oceans.
Prerequisite EASC0121, EASC0105 and EASC0118 or EASC0120
* *Offered from 2008-2009.*

EASC2130 Earth observation and remote sensing * (6 credits)

This course will provide an introduction to the theory and techniques of remote sensing and GIS in Earth and Planetary Observation.
This course introduces the theory and techniques of remote sensing and their application to environmental analysis. Remote sensing deals with the acquisition of information using techniques that do not require actual contact with the object or area being observed. Examples of remotely sensed data include aerial photography, infrared thermometry, and passive microwave sensing.
Prerequisite EASC0121, EASC0105 and EASC0118 or EASC0120
* *Offered from 2009-2010.*

EASC2131 A cool world: ice ages and climate change * (6 credits)

This course set out to provide students with an understanding of how dynamics Earth is and how it has changed over the past 2.5 million years.
Prerequisite EASC0121, EASC0105 and EASC0118 or EASC0120
* *Offered from 2008-2009.*

EASC2201 Hydrogeology (6 credits)

To study the role of ground water in subsurface geological process and its environmental and geotechnical importance.
Prerequisite EASC0116 or EASC1107

EASC2301 Field camps (6 credits)

The aims of a geological field camp are to provide 1) essential training and experience in geological mapping techniques and 2) opportunities to study at first-hand areas of particular geological interest and importance, especially outside Hong Kong.
Prerequisite Students must have completed at least 42 credits of Earth Sciences courses at the time of taking the second year camp.

EASC2307 Directed studies in earth sciences (6 credits)

To enhance the student's knowledge of a particular topic and the student's self-directed learning and critical thinking skills.
Prerequisite Major in Earth Sciences and at least 18 credits of introductory-level courses in Earth Sciences, and consent of Major Coordinator. Students must have a GPA of 2.5 or above.

EASC3114 Earth resources and environments (6 credits)

To study the range of earth materials that are commercial and exploitable, and the processes that lead to their formation. To consider economic, political and environmental aspects of mineral exploitation.
Prerequisite EASC2109
Co-requisite EASC2109

EASC3115 Regional geology and tectonics (6 credits)

To cover the tectonic evolution of mainland East Asia and SE Asia, with a specific focus on the geology of Hong Kong.
Prerequisite EASC2110

EASC3132 Earth resources * (6 credits)

To study the range of earth materials that are commercial and exploitable, and the processes that lead to their formation. To consider economic, political and environmental aspects of mineral exploitation.
Prerequisite EASC0105 or EASC0118 or EASC0119 or EASC2109
Co-requisite EASC2109
* *Offered from 2008-2009.*

EASC3133 Applied geochemistry * (6 credits)

Prerequisite EASC0105 or EASC0118 or EASC0119
* *Offered from 2009-2010.*

EASC3134 Regional geology * (6 credits)

To cover the tectonic evolution of mainland East Asia and SE Asia, with a specific focus on the geology of Hong Kong.
Prerequisite EASC0105 or EASC0118 or EASC0119 or EASC2110
* *Offered from 2008-2009.*

EASC3202 Soil and rock mechanics (6 credits)

To provide a basic knowledge of soil and rock mechanics for those wishing to consider further studies on a career in engineering geology/geotechnics.
Prerequisite EASC2201

EASC3203 Engineering geology (6 credits)

Introduction to the applications of geological data, techniques and principles to the study of natural materials (rock, soil and subsurface fluids), and the features and processes affecting the planning of land-use, and the planning, design, construction, operation and maintenance of engineering structures.
Prerequisite EASC2201
Co-requisite EASC3202

EASC3302 Advanced topics in geosciences * (6 credits)

To provide students with insights into current issues in geosciences, and options to specialize in particular subject areas.
Prerequisite Students must have completed at least 36 credits of advanced Earth Sciences courses.
* *Not offered in 2007-2008.*

EASC3304 Applied geosciences (6 credits)

To provide students with insights in the applied fields of geosciences and allow students to acquire technical skills and training in particular field and instrumental techniques in geology, geophysics, and geochemistry.
Prerequisite Students must have completed at least 36 credits of advanced Earth Sciences courses.

EASC3308 Earth sciences project (12 credits)

To enhance the student's knowledge, ability and interest in advanced studies in the Earth Sciences by providing the student with an opportunity to be engaged in an advanced research project.
Prerequisite Major in Earth Sciences and at least 18 credits on advanced-level courses in Earth Sciences, and consent of Major Coordinator. Students must have a GPA of 3.0 or above.

Department of Mathematics

MATH0011 Numbers and patterns in nature and life (3 credits)

To explore the underlying mathematical structure in various topics in life and environmental sciences. Students from all disciplines will gain appreciation of mathematics as a potent tool for investigating and understanding nature and life.
Prerequisite HKCEE Mathematics

MATH0201 Basic calculus * (6 credits)

To provide students with a basic background of calculus that can be applied in various disciplines, aiming at students not having done much mathematics beyond HKCEE mathematics. It can be followed by MATH1804 (University Mathematics A). Students with good grades in this course can also consider taking MATH1805 (University Mathematics B) or MATH1211 (Multivariable Calculus) as follow up.
Prerequisite HKCEE Mathematics. Students with HKCEE Additional Mathematics or AS Mathematics and Statistics or equivalent or mathematics at a higher level are not allowed to take this course.
* *Students having passed MATH0801 are not allowed to take this course.*

MATH1001 Fundamental concepts of mathematics * (6 credits)

To provide students with solid background on fundamental concepts of mathematics and methods of mathematical proofs. Such concepts and methods are important for subsequent studies in all higher level courses in mathematics. This course can be followed by (or taken concurrently with) MATH1111, MATH1211 and other more advanced courses.
Prerequisite HKCEE Additional Mathematics or AS Mathematics and Statistics or equivalent. Students with good grades in HKCEE Mathematics and have strong interests in mathematics may also apply.
* *Students having passed MATH1101 and MATH1201 are not allowed to take this course.*

MATH1111 Linear algebra * (6 credits)

Linear algebra has wide applications to diverse areas in natural science, engineering, management, and social science. This course provides students an introduction to the theory and techniques of linear algebra. It is a foundation course for all mathematics students, to be followed by other more advanced courses in mathematics such as MATH2301, MATH 2303.
Prerequisite HKCEE Additional Mathematics and AS Mathematics and Statistics, or AL Pure Mathematics, or MATH1804, or equivalent. Students with a good grade in MATH0201 can also apply.
* ***Students having passed MATH1101 and MATH1102 are not allowed to take this course.***

MATH1211 Multivariable calculus * (6 credits)

Students of this course will learn the theory of multivariable calculus in a rather rigorous manner, and learn how to apply the theory to solve practical problems. This is a foundation course for all mathematics students, to be followed by other more advanced courses in mathematics.
Prerequisite HKCEE Additional Mathematics and AS Mathematics and Statistics, or AL Pure Mathematics, or MATH1804, or equivalent. Students with a good grade in MATH0201 can also apply.
* *Students having passed MATH1202 are not allowed to take this course.*

MATH1804 University mathematics A * (6 credits)

To provide students with a more solid background of calculus of one variable and an introduction to calculus of several variables and matrices that can be applied in various disciplines, aiming at students having taken an elementary calculus course. It can be followed by MATH1211 (Multivariable Calculus).

Prerequisite HKCEE Additional Mathematics or AS Mathematics and Statistics or MATH0201. Students with AL Pure Mathematics or equivalent, or taking or having passed MATH1805 or MATH1211, are not allowed to take this course.

* *Students having passed MATH0802 or MATH1811 or MATH1812 are not allowed to take this course.*

MATH1805 University mathematics B * (6 credits)

To provide students with a solid background of calculus of several variables and matrix algebra and an introduction to ordinary differential equations that can be applied in various disciplines. This course can be followed by other more advanced courses in mathematics.

Prerequisite HKCEE Additional Mathematics and AS Mathematics and Statistics, or AL Pure Mathematics, or equivalent. Students with a good grade in MATH0201 can also apply. Student taking or having passed MATH1211 or MATH1813 are not allowed to take this course.

* *Students having passed MATH1202 or MATH1803 or MATH1811 or MATH1812 are not allowed to take this course.*

MATH1813 Mathematics methods for actuarial science * (6 credits)

To provide students with a background of calculus of several variables and matrix algebra and an introduction to ordinary differential equations that can be applied in actuarial science.

Prerequisite AL Pure Mathematics or equivalent. Students taking or having passed in MATH1803 or MATH1211 or MATH1805 are not allowed to take this course.

* *Students having passed MATH1202 or MATH1803 are not allowed to take this course.*

MATH2000 Intermediate mathematics project (6 credits)

This course is designed for student who would like to take an early experience on independent study. It provides the student with the opportunity to do a small mathematics project close to research in nature independently.

Prerequisite MATH1101, MATH1102, MATH1201, MATH1202

Co-requisite MATH2301 and MATH2401

MATH2001 Development of mathematical ideas (6 credits)

(1) To acquaint the students with the origin and growth of basic mathematical concepts.
(2) To assist the students to gain a deeper insight and broader view of mathematics as a discipline and human endeavour.
(3) To provide the students with an opportunity to write on and talk about mathematics, and to engage in independent study.

Prerequisite MATH1101 and MATH1102 and MATH1201 and MATH1202

MATH2002 Mathematics seminar * (6 credits)

This is a seminar style course intended for those who have very strong interests and good ability in mathematics. Students will be given book chapters and elementary research articles for private study and then make presentations in front of the whole class. Individual meetings with the instructors will be arranged prior to their presentations. Active participation in all the discussions is expected. The aim of the course is to let students learn how to initiate self/independent study in mathematics.

Prerequisite MATH1001, MATH1111 and MATH1211 (one of MATH1111 and MATH1211 can be co-requisite). Enrollment needs instructors' approval.

* *This course is for first year BSc students only.*

MATH2201 Introduction to mathematical analysis * (6 credits)

Prerequisite MATH1101 and MATH1102 and MATH1201 and MATH1202

* *Not offered in 2007-2008.*

MATH2301 Algebra I (6 credits)

This course aims to present those fundamental topics and techniques of algebra that are finding wide applications in mathematics and the applied sciences. It is complete in itself, and may also be followed by Algebra II and Topics in Applied Discrete Mathematics.

Prerequisite 1) (Two out of MATH1101, MATH1102, MATH1201, MATH1202, one of which should be MATH1102); or 2) (MATH1811/MATH1812 or MATH1803); or 3) (MATH1801/MATH1802 or MATH1807)

MATH2303 Matrix theory and its applications (6 credits)

Matrix theory has a close connection with other mathematical subjects such as linear algebra, functional analysis, and combinatorics. It also plays an important role in the development of many subjects in science, engineering, and social sciences. In this course, students will be taught the fundamentals of matrix analysis and its application to various kinds of practical problems. Mathematical software will be used in the course, so that students can learn how to use the computer to solve matrix problems.

Prerequisite 1) (MATH1101 and MATH1102); or 2) (MATH1811/MATH1812 or MATH1803); or 3) (MATH1801/MATH1802 or MATH1807)

MATH2304 Introduction to number theory (6 credits)

This course introduces students to the basic knowledge and techniques in number theory. It is hoped that it will stimulate interested students to delve into the rich literature associated with this historically important subject of mathematics.

Prerequisite MATH1101 and MATH1201

Co-requisite MATH2301

MATH2401 Analysis I (6 credits)

This course extends to more general situations some of the results covered in the first year Mathematics courses, and introduces some further basic concepts which are essential for more advanced studies in mathematical analysis.

Prerequisite 1) (MATH1201 and MATH1202); or 2) (MATH1811/MATH1812 or MATH1803); or 3) (MATH1801/MATH1802 or MATH1807)

MATH2402 Analysis II (6 credits)

This course gives a modern treatment of calculus in several variables which is essential for more advanced studies in analysis.
Prerequisite 1) (MATH1201 and MATH1202) and (MATH1101 or MATH1102); or 2) (MATH1811 /MATH1812 or MATH1803); or 3) (MATH1801/MATH1802 or MATH1807)

MATH2403 Functions of a complex variable (6 credits)

This course is indispensable for studies in higher mathematical analysis and the more theoretical aspects of physics. In this course, the students are introduced to the fundamental concepts and properties of analytic functions and are shown how to look at analyticity from different points of view. At the same time, the techniques of solving problems without losing sight of the geometric picture are emphasized.
Prerequisite 1) (Two out of MATH1101, MATH1102, MATH1201, MATH1202, one of which should be MATH1201 or MATH1202); or 2) (MATH1811/MATH1812 or MATH1803); or 3) (MATH1801/MATH1802 or MATH1807)

MATH2405 Differential equations (6 credits)

The standard topics in the wide field of differential equations included in this course are of importance to students of mathematics and physical sciences as well. Our emphasis is on principles rather than routine calculations and our approach is a compromise between diversity and depth.
Prerequisite 1) (Two out of MATH1101, MATH1102, MATH1201, MATH1202, one of which should be MATH1201 or MATH1202); or 2) (MATH1811/MATH1812 or MATH1803); or 3) (MATH1801/MATH1802 or MATH1807)

MATH2600 Discrete mathematics * (6 credits)

To introduce students to the basic ideas and techniques of discrete mathematics.
Prerequisite Any two of MATH1xxx-level or higher mathematics courses. Students having passed in MATH1800 are not allowed to take this course.
* *Not offered in 2007-2008.*

MATH2601 Numerical analysis (6 credits)

This course covers both the theoretical and practical aspects of Numerical Analysis. Emphasis will be on basic principles and practical methods of solution, using high speed computers.
Prerequisite 1) (Two out of MATH1101, MATH1102, MATH1201, MATH1202, one of which should be MATH1201 or MATH1202) or (MATH1811/MATH1812 or MATH1803) or (MATH1801/MATH1802 or MATH1807); and 2) Knowledge of a programming language

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MATH2603 Probability theory (6 credits)

The emphasis of this course will be on probability models and their applications. The primary aim is to elucidate the fundamental principles of probability theory through examples and to develop the ability of the students to apply what they have learned from this course to widely divergent concrete problems.
Prerequisite 1) MATH1201 and MATH1202; or 2) MATH1811 and MATH1812; or 3) MATH1803; or 4) MATH0801 and MATH0802

MATH2901 Operations research I (6 credits)

The objective is to provide a fundamental account of the basic results and techniques of Linear Programming and its related topics in Operations Research. There is an equal emphasis on all three aspects of understanding, algorithms and applications. The course serves, together with a course on network models, as essential concept and background for more advanced studies in Operations Research.

Prerequisite Two out of MATH1101, MATH1102, MATH1201, MATH1202, one of which should be MATH1101 or MATH1102

MATH2904 Introduction to optimization (6 credits)

This course introduces students to the theory and techniques of optimization, aiming at preparing them for further studies in Operations Research, Mathematical Economics and related subject areas.

Prerequisite (MATH1101 or MATH1102) and (MATH1201 or MATH1202)

MATH2905 Queueing theory and simulation * (6 credits)

This course introduces students to the models and theory of queueing system, as well as the technique of simulation as a practical tool of analysis.

Prerequisite (STAT1301 or STAT1007) and (MATH1101 or MATH1102) and (MATH1201 or MATH1202)

Co-requisite MATH2603 or its equivalent

* *Not offered in 2007-2008.*

MATH2906 Financial calculus (6 credits)

This course gives an elementary treatment of the modeling of financial derivatives, asset pricing and market risks from an applied mathematician's viewpoint. Stochastic calculus and numerical methods will be introduced.

Prerequisite (STAT1301 or STAT1007) and (MATH1101 or MATH1102) and (MATH1201 or MATH1202)

Co-requisite MATH2603 or its equivalent

MATH2907 Numerical methods for financial calculus * (6 credits)

This course is aimed at providing effective numerical methods as well as their theoretical aspect for solving problems arisen from financial derivatives and asset pricing.

Prerequisite (MATH1101 or MATH1102) and (MATH1201 or MATH1202)

Co-requisite MATH2603 and MATH2906 or their equivalent

* *Not offered in 2007-2008.*

MATH2999 Directed studies in mathematics * (6 credits)

To provide the student with an experience of independent study on a particular mathematics topic or working on a small scale mathematics project.

Prerequisite Major in Mathematics and at least 18 credits on introductory-level courses in Mathematics, and consent of Major Coordinator. Additional prerequisite may be required, depending on the topic of the study.

* *Offered from 2008-2009.*

MATH3000 Mathematics project (6 credits)

The object is to provide a student with an opportunity to formulate and investigate, in depth, a problem of practical interest and/or have a foretaste of mathematical research. The work, to be done on an individual basis, is considered a highly desirable part of the training of a mathematician.
Prerequisite MATH1101 and MATH1102 and MATH1201 and MATH1202 and MATH2301 and MATH2401

MATH3302 Algebra II (6 credits)

This course is an extension of Algebra I and goes deeper into the various topics treated in that course. Together, the two courses are complete in themselves, and may be followed by Topics in Algebra and Topics in Applied Discrete Mathematics.
Prerequisite MATH2301

MATH3310 Topics in algebra * (6 credits)

To provide students specializing in mathematics with the opportunity to study some topics in algebra in greater depth.
Prerequisite MATH1101 and MATH1102 and MATH1201 and MATH1202 and MATH2301
* *Not offered from 2007-2008.*

MATH3404 Functional analysis (6 credits)

This course introduces students to the basic knowledge of linear functional analysis, an important branch of modern analysis.
Prerequisite MATH1101 and MATH1102 and MATH1201 and MATH1202 and MATH2401

MATH3406 Introduction to partial differential equations (6 credits)

This course introduces students to the basic techniques for solving partial differential equations as well as the underlying theories.
Prerequisite MATH1101 and MATH1102 and MATH1201 and MATH1202 and MATH2401
Co-requisite MATH2405

MATH3501 Geometry (6 credits)

As geometric forms often appear in nature, the study of geometry helps us to understand better the universe in which we live. Moreover, geometry has much intrinsic beauty and the study of it is an excellent training in intuitive thinking. In this course we study the differential geometry of curves and surfaces in 3-space. In the study of regular surfaces in 3-space we exhibit geometric notions that are definable in terms of metrical properties of these surfaces alone, leading to the intrinsic geometry of surfaces.
Prerequisite MATH1101 and MATH1102 and MATH1201 and MATH1202 and MATH2401

MATH3502 Geometric topology (6 credits)

This course gives a geometric introduction to some of the methods of algebraic topology. The emphasis throughout will be on the geometric motivations and applications of the theory.
Prerequisite MATH1101 and MATH1102 and MATH1201 and MATH1202 and MATH2301 and MATH2401

MATH3602 Scientific computing (6 credits)

This course introduces mathematical theories and computational techniques for solving various kinds of matrix computation problems that are often encountered in scientific or industrial applications.
Prerequisite MATH1101 and MATH1102 and MATH1201 and MATH1202
Co-requisite MATH2601

MATH3610 Topics in applied discrete mathematics * (6 credits)

To provide students with the opportunity to study some further topics in applied discrete mathematics.
Prerequisite MATH1800 and MATH2301
* *Not offered from 2007-2008.*

MATH3902 Operations research II (6 credits)

The objective is to provide a fundamental account of the basic results and techniques of Integer Programming (IP), Dynamic Programming (DP) and Markov Decision Processes (MDP) in Operations Research. There is emphasis on aspects of algorithms as well as applications. The course serves, together with courses on linear programming and network models, to provide essential optimization concept and algorithms for more advanced studies in Operations Research.
Prerequisite Two out of MATH1101, MATH1102, MATH1201, MATH1202, one of which should be MATH1101 or MATH1102
Co-requisite MATH2901

MATH3903 Network models in operations research (6 credits)

The objective is to provide a fundamental account of the basic results and techniques of network models in Operations Research. There is an equal emphasis on all three aspects of understanding, algorithms and applications. The course serves, together with a course on linear programming, to provide essential concept and background for more advanced studies in Operations Research.
Prerequisite Two out of MATH1101, MATH1102, MATH1201, MATH1202, one of which should be MATH1101 or MATH1102
Co-requisite MATH2901

MATH3910 Topics in mathematical programming & optimization (6 credits)

A study in greater depth of some special topics in mathematical programming or optimization. It is mainly intended for students in Operations Research or related subject areas.
Prerequisite MATH2901 and MATH2904

MATH3999 Mathematics project * (12 credits)

To provide the student with an opportunity to formulate and investigate in depth a mathematical problem or topic, so as to give the student a foretaste of mathematical research. The work, to be done on an individual basis, is considered a highly desirable part of the training of a mathematician.
Prerequisite Major in Mathematics and at least 24 credits on advanced-level courses in Mathematics, and consent of Major Coordinator. Additional prerequisite may be required, depending on the topic of the project.
* *Offered from 2009-2010.*

Department of Pharmacology

PHAR3001 Clinical pharmacology I (3 credits)

This course presents the fundamental principles in pharmacology and relevant knowledge pertaining to drugs in common use. It will provide an understanding of pharmacokinetics and pharmacodynamics which is essential for administering and managing drug therapy. The therapeutic effects and mechanisms of action of the drugs most frequently prescribed will be covered.
Prerequisite Preferably CHEM3405 and CHEM3407
Co-requisite Preferably CHEM3405 and CHEM3407

PHAR3002 Clinical pharmacology II (3 credits)

This course presents the fundamental principles in pharmacology and relevant knowledge pertaining to drugs in common use. It will provide an understanding of pharmacokinetics and pharmacodynamics which is essential for administering and managing drug therapy. The therapeutic effects and mechanisms of action of the drugs most frequently prescribed will be covered.
Prerequisite Preferably CHEM3405 and CHEM3407
Co-requisite Preferably CHEM3405 and CHEM3407

Department of Physics

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

This general education course is designed as an elective for students in all disciplines and all years. No prior knowledge in astronomy, physics, and higher mathematics is required.
Prerequisite Nil
* *Not available to those who have taken YSCN0009 unless approved by course coordinator.*

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

This general education course is designed as an elective for students in all disciplines and all years. It focuses on the theoretical aspect of astronomy. No prior knowledge in astronomy, physics, or higher mathematics is required.
Prerequisite Nil

PHYS0114 Fundamental physics I * (6 credits)

This course, together with *Fundamental Physics II*, aims at providing students who are interested in physics, or taking a minor option in physics, a first course in general physics. It covers the essential knowledge of physics on various topics. Students who have taken the course can have a smooth link-up with other courses offered in the Physics Department.
Prerequisite HKCEE Physics/Engineering Science (students with AL/AS Physics or AL Engineering Science should first obtain approval from the course selection advisor)
* *Not available to those who have taken or are concurrently taking PHYS1111, PHYS1112, PHYS1113, or PHYS1314 unless approved by course selection advisor.*
Not available to students who have taken HKU-SPACE course College Physics I.

PHYS0115 Fundamental physics II * (6 credits)

This course, together with *Fundamental Physics I*, aims at providing students who are interested in physics, or taking a minor option in physics, a first course in general physics. It covers the essential knowledge of physics various topics. Students who have taken the course can have a smooth link-up with other courses offered in the Physics Department.

Prerequisite HKCEE Physics/Engineering Science (students with AL/AS Physics or AL Engineering Science should obtain first approval from the course selection advisor)

* *Not available to those who have taken or are concurrently taking PHYS1111, PHYS1112, PHYS1113, or PHYS1314 unless approved by course selection advisor.*
Not available to students who have taken HKU-SPACE course College Physics II.

PHYS0601 God, the big bang and Stephen Hawking I * (3 credits)

This course, named after a recently published book by David Wilkinson, is for both science and non-science students to recognize the absence of any real conflict between science and religion. This course (part I) deals with religion and its interactions with cosmology.

Prerequisite Nil

* *Not offered in 2007-2008.*

PHYS0602 Science or fiction? * (3 credits)

The course is designed as an exploration of the various way in which science, particularly physics, has been used in the creation of the literary genre known as science fiction. One of its main purposes is to provide students with experience in expressing their ideas and opinions in written and spoken form and in developing their analytical and creative powers.

Prerequisite Nil

* *Not offered in 2007-2008.*

PHYS0603 Art & physics * (3 credits)

The course is aimed at artistically inclined students who would like to know more about the New Physics, scientifically inclined students who would like to have a framework to appreciate Art, and anyone who is fascinated by both.

Prerequisite Nil

* *Not offered in 2007-2008.*

PHYS0605 Nuclear energy and the environment * (3 credits)

To introduce the use of nuclear power and its impact to our environment; and to arouse an awareness of the safety use of nuclear energy.

Prerequisite Nil

PHYS0607 Revealing the magic in everyday life * (3 credits)

The course is designed for students who are curious about science in daily life. Students taking this course should have basic training in physics in the certificate level. The course covers the working principles and mechanisms of the things and phenomena around us. Logical thinking and appreciation

of science are emphasized with mathematics kept at a minimum. Students are trained to develop scientific intuition and to appreciate that many things in everyday life are not purely magical but can also be predictable.
Prerequisite HKCEE Physics
* *Not available to students who have taken YSCN0018 or the HKU-SPACE course "The Science of Everyday Life".*

PHYS0608 Kitchen science: kitchen mysteries revealed (3 credits)

The course aims to develop students' critical thinking skills and broaden their basic science knowledge by exploring the science behind the common daily life activity of cooking. Basic physical and chemical concepts necessary to understand food preparation, as illustrated by recipes from cuisines from different regions, will be introduced.
Prerequisite Nil

PHYS0610 Weather today (3 credits)

To introduce the phenomena and mechanisms of the atmosphere, including typhoons, tornadoes, El Nino and La Nina. This course is designed to be an elementary introduction of weather and climate. It is suitable for any students with interest in the subject.
Prerequisite Nil

PHYS0611 Magic of flight (3 credits)

The course aims to provide introduction of the basic principles of flight and encourage integration of knowledge from different disciplines by comparing the biological and technological achievements of flight.
Prerequisite Nil

PHYS0625 Physics by inquiry (6 credits)

This course aims at providing students a solid background and knowledge in physics and its connection with our daily life phenomena and activities.
Prerequisite HKCEE Physics (Students without HKCEE Physics should obtain approval from Course Coordinator before choosing this course)

PHYS1303 Special relativity I (3 credits)

This course is designed as an elective for students in all disciplines and all years with science background.
Prerequisite 1 AL/AS in any science subject

PHYS1315 Methods in physics I * (6 credits)

This course provides students with experience in using mathematical tools and techniques to solve problems in physics. It is complete in itself, or may also be followed by Methods in Physics II.
Prerequisite AL Pure Mathematics or AS Mathematics & Statistics or HKCEE Additional Mathematics
* *Not available to students who have taken / are taking MATH1811 or MATH1812 unless approved by course coordinator.*

PHYS1316 Methods in physics II * (6 credits)

This course provides students with experience in using mathematical tools and techniques to solve problems in physics. It is complete in itself, or may also be taken after Methods in Physics I.

Prerequisite AL Pure Mathematics or AS Mathematics & Statistics or HKCEE Additional Mathematics

* *Not available to students who have taken / are taking MATH1811 or MATH1812 unless approved by course coordinator.*

PHYS1411 Introductory experimental physics * (6 credits)

An experimental course designed to provide students with experience in laboratory techniques and instrumentations.

Prerequisite AL/AS Physics or AL Engineering Science

* *Not available to those who have taken PHYS0411 unless approved by course coordinator.*

PHYS1412 Electronics (6 credits)

This course is designed to provide students with a broad knowledge of the theoretical background and experimental application of modern electronic devices and circuitry.

Prerequisite AL/AS Physics or AL Engineering Science

PHYS1413 Physics in a nutshell * (6 credits)

This course covers the essential topics in physics in one semester. It serves as a first course to students who are interested in physics or those who are planning to take physics as a minor. The conceptual ideas are emphasized and the mathematical treatment is moderate.

Prerequisite AS/AL Physics or Engineering Science

* *Not available to those who have taken or concurrently taking PHYS1414, PHYS1415, PHYS0114, PHYS0115, PHYS1111, PHYS1112 or PHYS1113 unless approved by course selection advisor. Not available to students who have taken HKU-SPACE course College Physics I or II.*

PHYS1414 General physics I * (6 credits)

This course is the first of a two-course series designed to offer a comprehensive training of physics covering all the major building blocks of the physical laws governing nature, including mechanics, oscillation and waves, thermal physics, electricity and magnetism, optics, and atomics physics.

Prerequisite 1) HKCEE Additional Mathematics or AS Mathematics & Statistics or AL Pure Mathematics; and 2) AL/AS Physics or Engineering Science

* *Not available to those who have taken or are concurrently taking PHYS1111, PHYS1112, PHYS1113 or PHYS1314 unless approved by course selection advisor.*

PHYS1415 General physics II * (6 credits)

This course is the second of a two-course series designed to offer a comprehensive training of physics covering all the major building blocks of the physical laws governing nature, including mechanics, oscillation and waves, thermal physics, electricity and magnetism, optics, and atomics physics.

Prerequisite 1) HKCEE Additional Mathematics or AS Mathematics & Statistics or AL Pure Mathematics; and 2) AL/AS Physics or Engineering Science

* *Not available to those who have taken or are concurrently taking PHYS1111, PHYS1112, PHYS1113 or PHYS1314 unless approved by course selection advisor.*

PHYS2021 The physical universe (6 credits)

To appreciate the underlying physical principles of astronomy. This course is designed as an elective for second or third year students with some basic science knowledge.
Prerequisite PHYS0001 or YSCN0009

PHYS2022 Observational astronomy (6 credits)

To introduce the students to the techniques and methods of contemporary astronomy, with emphasis on the data reduction and analysis.
Prerequisite Any 1st year science or engineering course

PHYS2023 Stellar physics (6 credits)

This course introduces the basic theory of stellar structure and evolution. It follows a mathematical treatment that stress on the underlying physical processes. This course is calculus-based. A good background in first year level classical mechanics and electromagnetism is recommended.
Prerequisite PHYS1111 or PHYS1314

PHYS2024 Introduction to cosmology * (6 credits)

The aim of the course is to offer an introduction to the key ideas in observational and theoretical cosmology, to familiarize students with the main observational results on which modern cosmology is based and to introduce, at an elementary level, the basic physical principles used to model the evolution and dynamics of the universe from the big bang to the present epoch.
Prerequisite PHYS1111 or PHYS1314
* *Not offered in 2007-2008.*

PHYS2221 Introductory solid state physics (6 credits)

To provides a broad introduction to modern theories of the behaviour and properties of the solid state of matter. It is designed as a self-contained course which at the same time will serve as a basis for more advanced courses and projects in solid state physics.
Prerequisite PHYS1314

PHYS2222 Waves and optics (6 credits)

To give a coherent introduction to the development of modern physical optics, with particular attention to the wave properties and quantum theories of light.
Prerequisite PHYS1112 and PHYS1113

PHYS2224 Computational modeling of physical systems * (6 credits)

The aim of this course is to introduce the students to handling data (obtained either from physics experiments or physical models) and computational methods for modelling physical systems.
Prerequisite 1) Any 1st year physics course; and 2) CSIS0911 or CSIS1117
* *Not offered in 2007-2008.*

PHYS2225 Solid state devices * (6 credits)

The aim of this course is to give an introduction to the physics and operating principles of commonly used solid state devices.
Prerequisite PHYS1314
* *Not offered in 2007-2008.*

PHYS2227 Laser & spectroscopy (6 credits)

The aim of this course is to provide a broad introduction to modern laser spectroscopic techniques and selected applications.
Prerequisite PHYS1314 and PHYS2222 and PHYS2323

PHYS2228 Introductory health physics (6 credits)

This course aims at providing students with basic knowledge in the scientific and engineering aspects of health physics and to arouse students' interest in the area of peaceful application of ionizing and non-ionizing radiations.
Prerequisite PHYS0605 or PHYS1314

PHYS2229 Thin film physics * (6 credits)

This course is intended for the advanced students, covering the basic theories and techniques of physical deposition processes and topics related to a very rapidly growing area - thin film application in material science.
Prerequisite PHYS1111
* *Not offered in 2007-2008.*

PHYS2234 Sensors and computer control for physical measurements * (6 credits)

The aim of this course is to introduce students to basic principles of measurement and control, and sensors for measurement of different physical quantities (temperature, pressure etc.), as well as provide students with practical skills for designing and operating computer controlled measurement systems.
Prerequisite Any 1st year science or engineering course
* *Not offered in 2007-2008.*

PHYS2235 Physics of namomaterails * (6 credits)

Physics of Nanomaterials is a course for advanced undergraduate and beginning postgraduate students at HKU. The course is designed to introduce important concepts such as quantum size effect and fundamental physics of nanomaterials.
Prerequisite PHYS1314
* *Not offered in 2007-2008.*

PHYS2304 Special relativity II * (3 credits)

This is a follow up course to PHYS1313, with the aim of providing an introduction to the advanced aspects of the theory of special relativity and of its applications.
Prerequisite PHYS1303 or PHYS1314
* *Not offered in 2007-2008.*

PHYS2321 Introductory electromagnetism (6 credits)

Introduces the physical concepts required for an understanding of electricity and magnetism. A foundation course for students majoring in physics.
Prerequisite PHYS1111, PHYS1112 and PHYS1314
Co-requisite PHYS1113

PHYS2322 Statistical mechanics and thermodynamics (6 credits)

An introduction to Statistical Mechanics and elementary Thermodynamics with reference to related phenomena in Physics. This course is taught as a basic and essential subject for students majoring in Physics.
Prerequisite PHYS1111, PHYS1112 and PHYS1314
Co-requisite PHYS1113

PHYS2323 Introductory quantum mechanics (6 credits)

This course aims at a rigorous introduction to the concepts and methods of non-relativistic quantum mechanics. It is a prerequisite for several advanced physics courses.
Prerequisite PHYS1314

PHYS2324 Classical mechanics (6 credits)

The aim of this course is to introduce general methods of studying the dynamics of particle systems, through which students can acquire experience in using mathematical techniques for solving practical problems.
Prerequisite PHYS1111, PHYS1112 and PHYS1314
Co-requisite PHYS1113

PHYS2325 Theoretical physics (6 credits)

The aim of this course is to provide students with the conceptual skills and analytical tools necessary for solving real problems in all major areas of physics.
Prerequisite 1) PHYS1111 or PHYS1112 or PHYS1113 or PHYS1314; and 2) (MATH1811 and MATH1812) or (PHYS1315 and PHYS1316)

PHYS2426 Intermediate experimental physics * (6 credits)

This laboratory based course aims to familiarize students with some basic methods in physics experimentation, and in particular to illustrate the methods by carrying experiments related to electromagnetism and modern physics.
Prerequisite PHYS1411 and PHYS1314
* *Not available to those who have taken PHYS2421 or PHYS2422 unless approved by course coordinator.*

PHYS2523 Directed studies in physics (6 credits)

This course is designed for second year students who would like to take an early experience on research. It provides students with the opportunity to do small physics projects by themselves, either theoretical or experimental. These projects are close to research in nature and, usually, without lectures.
Prerequisite Any 1st year Physics course

PHYS2624 Introductory atmospheric physics * (6 credits)

To discuss the physical principles and mechanisms of atmospheric motions, weather phenomena, and climate. This course is designed to be an intermediate level course on modern meteorology. It is suitable for students with some background in physics or science.
Prerequisite Any 1st year science or engineering course
* *Course materials will be delivered by expert guest lecturers from the Hong Kong Observatory.*

PHYS2626 Introductory classical mechanics * (6 credits)

This course aims at providing students a solid foundation in classical Newtonian mechanics with rigorous mathematical treatments. Students are expected to have good working knowledge of calculus and vectors.
Prerequisite PHYS1413 or PHYS1414
* *Not offered in 2007-2008.*

PHYS2627 Introductory quantum physics * (6 credits)

This course is designed to provide students with a comprehensive introduction to the concepts and ideas related to study of physics in the microscopic scale ─ which revolutionize our understanding of the properties of light and matter in the universe.
Prerequisite PHYS1413 or PHYS1414 or PHYS1415
* *Not available to those who have taken PHYS1314 unless approved by course coordinator.*

PHYS3031 Astrophysics (6 credits)

To introduce students to current theories in astrophysics. It may be taken as a self-contained course or as background to research work in astrophysics.
Prerequisite PHYS2321 and PHYS2322 and PHYS2323

PHYS3033 General relativity (6 credits)

To introduce students to the field of general relativity and to provide conceptual skills and analytical tools necessary for astrophysical and cosmological applications of the theory.
Prerequisite PHYS2321 and PHYS2322 and PHYS2323
Co-requisite PHYS1303

PHYS3034 Cosmology * (6 credits)

The aim of the course is to offer an advanced introduction to cosmology, to familiarize students with mathematical formulation used to model the evolution and dynamics of the universe, and to provide an up to date discussion of the big bang theory and structure and galaxy formation.
Prerequisite PHYS2321 and PHYS2322 and PHYS2323 and PHYS2024
* *Not offered in 2007-2008.*

PHYS3035 Stellar atmospheres * (6 credits)

This course is designed to provide students with the basic understanding of the interaction between radiation and matter, and the physics required to interpret modern astronomical observations.
Prerequisite PHYS2627
* *Not offered in 2007-2008.*

PHYS3036 Interstellar medium * (6 credits)

This course is designed to provide students with the fundamentals of gas dynamics, molecular and solid-state physics with applications to the structure of the interstellar medium.
Prerequisite PHYS2627
* *Not offered in 2007-2008.*

PHYS3037 Selected topics in astrophysics * (6 credits)

To introduce students some current topics in astrophysics. It may be taken as a self-contained course or as background to research work in astrophysics.
Prerequisite PHYS2627
* *Not offered in 2007-2008.*

PHYS3038 Planetary science * (6 credits)

This course is designed to provide students with a modern understanding of the structure of the solar system and their effects on the evolution of the Earth.
Prerequisite PHYS2627
* *Not offered in 2007-2008.*

PHYS3231 Computational physics (6 credits)

The aim of the course is to show how the power of computers enables a computational approach to solving physics problems to be adopted, which is distinct from, and complimentary to, traditional experimental and theoretical approaches. The material covered will be found useful in any project or problem solving work that contains a strong computational or data analysis element.
Prerequisite PHYS2321 and PHYS2322 and PHYS2323

PHYS3232 Solid state physics *(6 credits)

To provide students with an understanding of more advanced topics in selected areas of solid state physics.
Prerequisite PHYS2221 and PHYS2321 and PHYS2322 and PHYS2323
* *Not offered in 2007-2008.*

PHYS3321 Nuclear and particle physics * (6 credits)

The aim of the course is to describe nuclear structure in an elementary way as a field of application of quantum mechanics and electromagnetism, and to study the fundamental interactions of submuclear particles.
Prerequisite PHYS2323 and PHYS2321 and PHYS2322
* *Not available to those who have taken PHYS2326 unless approved by course coordinator.*

PHYS3331 Electromagnetic field theory (6 credits)

We study the electromagnetic properties of simple physical systems, and the relations between electromagnetism and special relativity.
Prerequisite PHYS2321 and PHYS2322 and PHYS2323 and PHYS2325

PHYS3332 Quantum mechanics (6 credits)

Introduces more advanced concepts of quantum mechanics. Together with PHYS2323, these will provide the basic knowledge of quantum mechanics to an undergraduate student.
Prerequisite PHYS2321 and PHYS2322 and PHYS2323 and PHYS2325

PHYS3333 Advanced statistical mechanics (6 credits)

This course intends to introduce some topics in the field of equilibrium statistical physics.
Prerequisite PHYS2321 and PHYS2322 and PHYS2323

PHYS3334 Advanced electromagnetic field theory (6 credits)

This is a standard course in electromagnetic field theory which provides essential background for postgraduate and advanced undergraduate students intend to do research in physics.
Prerequisite PHYS2321 and PHYS3331

PHYS3335 Advanced quantum mechanics (6 credits)

This course introduces postgraduate and advanced undergraduate students to advanced techniques in quantum mechanics and their applications to selected topics in physics.
Prerequisite PHYS2323 and PHYS3332

PHYS3431 Advanced experimental physics * (6 credits)

This course aims to introduce the student to some of the more advanced techniques in modern physics, while at the same time illustrating some of the important experiments discussed in course text books.
Prerequisite 1) PHYS2421 or PHYS2422 or PHYS2426; and 2) PHYS2321 and PHYS2322 and PHYS2323
* *Not available to those who have taken PHYS2423 unless approved by course coordinator.*

PHYS3531 Physics project (12 credits)

This course is designed for students who are considering doing research in the future. It provides students with the opportunity to study special physics projects by themselves, either theoretical or experimental. These projects are close to research in nature and are designed for prospective research students.
Prerequisite 1) PHYS2321; and 2) PHYS2323

PHYS3532 Special topics in physics (12 credits)

To provide the chance for students to learn special topics in modern physics by themselves by reviewing literature (theoretical project) or practicing special experimental skills in carrying out a small project (experimental project) under the supervision of a member of staff.
Prerequisite 1) PHYS2321; and 2) PHYS2323

Department of Statistics & Actuarial Science

STAT0301 Elementary statistical methods (6 credits)

Research findings are often fully or partly supported by data. Data, which are often concerned with situations involving variability and uncertainty, are collected from an experiment or a survey. They are used to estimate the true value of a certain quantity or to test the acceptability of a certain new hypothesis. Valid methods of analysing the data are thus essential to any successful investigation. The course presents the fundamentals of statistical methods widely used by researchers. There is no demand of sophisticated technical mathematics.

Prerequisite HKCEE Mathematics. Not available to students with a pass in A-level Pure Mathematics. (Students taking or having taken STAT1301 or STAT1306 or STAT0302 or STAT1000 or STAT1003 or STAT1006 or STAT1007 or STAT1008 or STAT1801 or STAT0601 or STAT0602 or ECON1003 are not allowed to take this course.)

STAT0302 Business statistics * (6 credits)

The discipline of statistics is concerned with situations involving uncertainty and variability. Variability greatly affects the interpretation of data. Thus statistics forms an important descriptive and analytical tool. This elementary course, which is taught without any technical mathematics, presents many standard situations of data interpretation with emphases on business examples. The statistical tests for these situations are presented. Microsoft Excel might be used to carry out some statistical analysis.

Prerequisite HKCEE Mathematics (Students taking or having taken STAT1301 or STAT1306 or STAT0301 or STAT1000 or STAT1003 or STAT1006 or STAT1007 or STAT1008 or STAT1801 or STAT0601 or STAT0602 or ECON1003 are not allowed to take this course.)

* *Available only to Business School students.*

STAT1301 Probability & statistics I (6 credits)

The discipline of statistics is concerned with situations in which uncertainty and variability play an essential role and forms an important descriptive and analytical tool in many practical problems. Against a background of motivating problems this course develops relevant probability models for the description of such uncertainty and variability and provides an introduction to the concepts, principles and methodology of statistical analysis.

Prerequisite 1) For students admitted in 2006 or before - A-level Pure Mathematics or AS-level Mathematics & Statistics or equivalent. (Students taking or having taken STAT0301 or STAT0302 or STAT1306 or STAT1001 or STAT1003 or STAT1006 or STAT1007 or STAT1008 or STAT1801 or STAT0601 or STAT0602 are not allowed to take this course.); and 2) For students admitted in 2007 or thereafter - A-level Pure Mathematics or AS-level Mathematics & Statistics or STAT0302 or (students taking or having taken STAT0301). (Students taking or having taken STAT1306 or STAT1801 are not allowed to take this course.)

STAT1302 Probability & statistics II (6 credits)

This course builds on STAT1301, introducing further the concepts and methods of statistics. Emphasis is on the two major areas of statistical analysis: estimation and hypothesis testing. Through the disciplines of statistical modelling, inference and decision making, students will be equipped with both quantitative skills and qualitative perceptions essential for making rigorous statistical analysis of real-life data.

Prerequisite A-level Pure Mathematics or AS-level Mathematics & Statistics or equivalent AND taking or having taken STAT1301 or STAT1000 or STAT1007 or STAT0601

STAT1303 Data management (6 credits)

This course is designed for students who want to learn a statistical software (SAS or SPSS) for data management and elementary data analysis. This course focuses on using SAS or SPSS to manage data set input and output, work with different data types, manipulate and transform data, perform random sampling and descriptive data analysis, and create summary reports.

Prerequisite HKCEE Mathematics or AS-level Mathematics & Statistics or A-level Pure Mathematics or equivalent AND taking or having taken STAT0301 or STAT0302 or STAT1301 or STAT1306 or ECON1003 or ECOL2006 or STAT1000 or STAT1001 or STAT1003 or STAT1006 or STAT1007 or STAT1008 or STAT2001 or STAT0601 or STAT0602 or STAT1801

STAT1304 The analysis of sample surveys (6 credits)

We often try to infer the characteristics of a population by taking a sample from that population. The validity and the efficiency of the findings depend on the quality of the sample. This course considers the basic theory and practical applications for the different sampling design and analysis. Examples on marketing surveys, social surveys and opinion polls will be considered.

Prerequisite HKCEE Mathematics or AS-level Mathematics & Statistics or A-level Pure Mathematics or equivalent AND taking or having taken STAT0301 or STAT0302 or STAT1301 or STAT1306 or STAT1801 or ECON1003 or ECOL2006 or STAT1000 or STAT1001 or STAT1003 or STAT1006 or STAT1007 or STAT1008 or STAT2001 or STAT0601 or STAT0602

STAT1305 Introduction to demography (6 credits)

Demography studies the distribution of population by age, gender, marital status, education level, culture, ethnicity, and other social and physical characteristics. It also focuses on population changes---migration, fertility and mortality rates. Knowledge in demography is vital to economic studies, business and government policymaking and investment planning. The course introduces important statistical methods pertinent to the study of demography, with attention to problems of regional interest.

Prerequisite HKCEE Mathematics or AS-level Mathematics & Statistics or A-level Pure Mathematics or equivalent AND taking or having taken STAT0301 or STAT0302 or STAT1301 or STAT1306 or ECON1003 or ECOL2006 or STAT1000 or STAT1001 or STAT1003 or STAT1006 or STAT1007 or STAT1008 or STAT2001 or STAT0601 or STAT0602 or STAT1801

STAT1306 Introductory statistics (6 credits)

The discipline of statistics is concerned with situations involving uncertainty and variability. The interpretation of data needs special techniques when variability plays a role, as it usually does. Thus statistics forms an important descriptive and analytical tool of many scientific disciplines. Candidates with a mathematical background will find this course suitable, because the language of mathematics allows the subject of statistics to be presented with economy and clarity.

Prerequisite A-level Pure Mathematics or AS-level Mathematics & Statistics or MATH0801 or MATH0802. Students without these qualifications, but with grade C or better in A-level Physics, are deemed to have sufficient mathematical training to enrol in this course. Students who intend to major in “Risk Management” or “Statistics” should take STAT1301 instead of this course. (Students taking or having taken STAT1301 or STAT0301 or STAT0302 or STAT1801 or ECON1003 are not allowed to take this course.)

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

This course provides the basic foundations in probability and statistics for students in B.Sc.(ActuarSc), though the course is also suitable for mathematically-able students from other quantitative curricula. Probability theory underpins the study of statistics. The course aims firstly to develop skills in probabilistic analysis for problems involving randomness. Random variables and probability distributions are studied in depth, such as discrete and continuous distributions, conditional probability, conditional expectation, central limit theorem. The concepts of statistics are then introduced, guided by motivating examples.

Prerequisite A-Level Pure Mathematics or AS-level Mathematics & Statistics or equivalent. (Students taking or having taken STAT0301 or STAT0302 or STAT1301 or STAT1306 or STAT1001 or STAT1003 or STAT1006 or STAT1007 or STAT1008 or STAT0601 or STAT0602 are not allowed to take this course.)

STAT1802 Financial mathematics (6 credits)

This course introduces the mathematics of finance which plays an important role in the development of basic actuarial techniques. Introduction to risk management and practical applications of the actuarial functions are also covered.

Prerequisite A-level Pure Mathematics or AS-level Mathematics & Statistics or equivalent AND taking or having taken STAT1801 or STAT1302

STAT2301 Linear statistical analysis (6 credits)

The analysis of variability is mainly concerned with locating the sources of the variability. Many statistical techniques investigate these sources through the use of 'linear' models. This course presents the theory and practice of these models.

Prerequisite STAT1302 (Students taking or having taken STAT0801 or STAT2804 are not allowed to take this course.)

STAT2302 Statistical inference (6 credits)

This course covers the advanced theory of point estimation, interval estimation and hypothesis testing. Using a mathematically-oriented approach, the course provides a solid and rigorous treatment of inferential problems, statistical methodologies and the underlying concepts and theory. It is suitable in particular for students intending to further their studies or to develop a career in statistical research.

Prerequisite STAT1302 or STAT2802

STAT2303 Probability modelling (6 credits)

This is an introductory course in probability modelling. A range of important topics in stochastic processes will be discussed.

Prerequisite STAT1301 or STAT1000 or STAT1007 or STAT0601 (Students taking or having taken STAT2803 or MATH2603 are not allowed to take this course.)

STAT2304 Design and analysis of experiments (6 credits)

In this course the basic theory of experimental design is introduced. Basic principles and guidelines for designing experiments will be introduced. Analysis for experiments with a single factor, Randomised block, Latin squares and related designs will be covered. The notions of crossed and nested factorial structure, balanced incomplete factorial experiments and fixed/random effects will be discussed.

Prerequisite STAT1302 or STAT2802 or STAT2311 or STAT0401 or STAT0603 or STAT0100 or STAT0604 or STAT0605

STAT2305 Quality control and management (6 credits)

The successful control of quality in production is a matter of primary importance to a company's prosperity and good-will. This course provides an overview of quality compromise which involves both the producer and the consumer. It presents a variety of statistical solutions including control chars, acceptance sampling plans, sequential sampling procedures, analysis of measurement errors, reliability, and life-testing. Contemporary quality management systems such as total quality control, quality control circle, zero defects, and ISO-9000 will be introduced The student is brought to the frontier of today's quality control and management ideas.

Prerequisite ECOL2006 or ECON1003 or STAT0301 or STAT1001 or STAT0302 or STAT1301 or STAT1306 or STAT1801 or STAT0100 or STAT2802 or STAT0604 or STAT0605

STAT2306 Business logistics (6 credits)

Originally, the word 'logistics' described the strategic aspects involved in moving and supplying armies and navies. Usage grew to include games of strategy, such as chess. Modern business corporations are increasingly using logistics as a management tool, for example, in capital budgeting problems, production planning, scheduling, transportation or in deciding a location for a new factory. This course addresses the business applications of logistics.

Prerequisite ECOL2006 or ECON1003 or STAT0301 or STAT0302 or STAT1301 or STAT1306 or STAT1801 or STAT1000 or STAT1001 or STAT1003 or STAT1006 or STAT1007 or STAT1008 or STAT2001 or STAT0601 or STAT0602 (Students taking or having taken MATH2901 are not allowed to take this course.)

STAT2307 Statistics in clinical medicine and bio-medical research (6 credits)

In clinical medicine doctors observe features (such as blood pressure, hormone level, presence/absence of a symptom, degree of infection, etc.) which are subject to natural variation between individual patients and between groups of patients with different disease types. This variability motivates the application of statistical methodology to the clinical observational and decision-making process. Part of the course deals with these applications.

The other part deals with statistical problems which come from biological and medical research, for example the controlled clinical drug trial. No knowledge in biology or medicine is assumed; the course provides all of the necessary bio-medical background when the statistical problems are introduced.

Prerequisite STAT1302 or STAT2802 or STAT0100 or STAT0604 or STAT0605

STAT2308 Statistical genetics (6 credits)

This course covers background on genetics, Mendelian Genetics; Hardy-Weinberg equilibrium; linkage equilibrium; exact test; likelihood ratio test; chi-square test; population structure; linkage analysis; non-parametric linkage analysis; association studies; forensic genetics; relatedness; kinship analysis; mixed samples.

Prerequisite STAT1302 or STAT2802 or STAT0100 or STAT0604 or STAT0605

STAT2309 The statistics of investment risk * (6 credits)

Most investments involve some risk. The decision to invest or not is usually made against a background of uncertainty. Whilst prediction of the future is difficult, there are statistical modelling techniques which provide a rational framework for investment decisions, particularly those relating to stock markets and the markets for interest rates, commodities and currencies. Building upon research, both in Hong Kong and abroad, this course presents the prevailing statistical theories for investment decisions

in these vital markets. Particular issues include the concept of an efficient market, portfolio construction and analysis, asset pricing, portfolio performance and management, and behavioural finance.

Prerequisite ECOL2006 or ECON1003 or STAT0301 or STAT0302 or STAT1301 or STAT1306 or STAT1801 or STAT1000 or STAT1001 or STAT1003 or STAT1006 or STAT1007 or STAT1008 or STAT2001 or STAT0601 or STAT0602

* *Actuarial Science students are not allowed to take this course.*

STAT2310 Risk management and insurance * (6 credits)

The course introduces the statistical, financial and legal principles underlying the techniques for managing the insurable risks faced by organizations and individuals. It is aimed at students who have minimal background in quantitative methods and is not available to students majoring in Actuarial Science. The course emphasizes basic risk management and financial planning, and students will be able to apply these concepts immediately to their own lives.

Prerequisite ECOL2006 or ECON1003 or STAT0301 or STAT0302 or STAT1301 or STAT1306 or STAT1801 or STAT1000 or STAT1001 or STAT1003 or STAT1006 or STAT1007 or STAT1008 or STAT2001 or STAT0601 or STAT0602

* *Actuarial Science students are not allowed to take this course.*

STAT2311 Computer-aided data analysis (6 credits)

A wide range of statistical analyses and methods are presented using data sets generated from social sciences research and scientific studies. These analyses deal with designed experiments in the laboratory or field-work setting together with data from less-rigorously planned observational studies. Measuring uncertainty, describing patterns of variability, and describing the inter-relationship between several variables are therefore essential aspects of social science and scientific investigations. These aspects require a good understanding of statistics. This computer-oriented but non-mathematical course develops the important concepts and methods of statistics. Although no knowledge of a programming language is required, the course makes extensive use of computers. This is made possible by high-quality, but user friendly statistical software like JMP or SPSS.

Prerequisite ECOL2006 or ECON1003 or STAT0301 or STAT0302 or STAT1306 or STAT1001 or STAT1003 or STAT1006 or STAT1008 or STAT2001 or STAT0602 or (CogSc students having taken STAT1000 or STAT1301) (Students taking or having taken STAT0603 are not allowed to take this course)

STAT2312 Data mining (6 credits)

With an explosion in information technology in the past decade, vast amounts of data appear in a variety of fields such as finance, marketing research, customer relations management, medicine and healthcare. The challenge of understanding these data with the aim of creating new knowledge and finding new relationships among data attributes has led to the innovative usage of statistical methodologies and development of new ones. In this process, a new area called data mining is spawned. This course provides a comprehensive and practical coverage of essential data mining concepts and statistical models for data mining.

Prerequisite ECOL2006 or ECON1003 or STAT0301 or STAT0302 or STAT1301 or STAT1306 or STAT1801 or STAT1000 or STAT1001 or STAT1003 or STAT1006 or STAT1007 or STAT1008 or STAT2001 or STAT0601 or STAT0602

STAT2313 Marketing engineering (6 credits)

This course is designed to provide an overview and practical application of trends, technology and methodology used in the marketing survey process including problem formulation, survey design, data collection and analysis, and report writing. Special emphasis will be put on statistical techniques particularly for analysing marketing data including market segmentation, market response models, consumer preference analysis and conjoint analysis. Students will analyse a variety of marketing case studies.

Prerequisite STAT0301 or STAT0302 or STAT1301 or STAT1306 or STAT1801 or ECON1003 or ECOL2006 or STAT1000 or STAT1001 or STAT1003 or STAT1006 or STAT1007 or STAT1008 or STAT2001 or STAT0601 or STAT0602

STAT2314 Business forecasting (6 credits)

In daily business operations, forecasts are routinely required on different aspects of the economy, the market and individual companies. Numerous statistical techniques have been developed in the past decades to provide forecasts for the business decision-maker. This course considers a wide range of such techniques that have proven useful to practitioners. The course will involve the use of computer software, EXCEL, in the teaching process.

Prerequisite ECOL2006 or ECON1003 or STAT0301 or STAT0302 or STAT1306 or STAT1001 or STAT1003 or STAT1006 or STAT1008 or STAT2001 or STAT0602

STAT2315 Practical mathematics for investment (6 credits)

The main focus of this course will be on financial mathematics of compound interest and financial derivatives. Introduction to risk management and practical applications of the actuarial functions are also considered.

Prerequisite Any introductory-level or junior-level course (Students taking or having taken STAT1802 are not allowed to take this course.)

STAT2318 Directed studies in statistics (6 credits)

To enhance the student's knowledge of a particular topic and the student's self-directed learning and critical thinking skills.

Prerequisite Major in Statistics or Risk Management and at least 18 credits of introductory-level courses in Statistics or Risk Management, and consent of Major Coordinator.

STAT2801 Life contingencies (6 credits)

The major objectives of this course are to integrate life contingencies into a full probabilistic framework and to demonstrate the wide variety of constructs which are then possible to build from basic models at the foundation of actuarial science. The time-until-death random variable will be the basic building block by which models for life insurances, designed to reduce the financial impact of the random event of untimely death, will be developed. Techniques for calculation benefit premiums and benefit reserves of various types of life annuity and insurance will be discussed.

Prerequisite (STAT1302 and STAT2315) or (STAT1802 and taking or having taken STAT2802) or (STAT1302 and STAT1802) or (STAT0100 and STAT0113)

STAT2804 Linear models and forecasting (6 credits)

This course deals with applied statistical methods of linear models and investigates various forecasting procedures through time series analysis.
Prerequisite STAT1302 or (Students taking or having taken STAT2802) or STAT0100 or STAT0605 (Students taking or having taken STAT2301 or STAT3301 or STAT0102 or STAT0604 or STAT3101 are not allowed to take this course)

STAT2805 Credibility theory and loss distributions (6 credits)

Credibility is an example of a statistical estimate. The idea of credibility is very useful in premium calculation. Insurance loss varies according to the business nature, what distribution should be used to fit a particular loss is both of theoretical interest and practical importance. This course covers important actuarial and statistical methods.
Prerequisite STAT1302 or STAT2802 or STAT3810 or STAT0100 or STAT0604 or STAT0605 or STAT0802

STAT2806 Financial economics (6 credits)

This course covers the skills necessary to construct and apply discrete stochastic models to value financial derivatives.
Prerequisite STAT1302 or STAT2802 or STAT0100 or STAT0604 or STAT0605

STAT2807 Corporate finance for actuarial science (6 credits)

This course is designed for actuarial science students to receive VEE-Corporate Finance from Society of Actuaries. The objective of this course is to introduce students to the fundamental principles of corporate finance. The course will provide students with a systematic framework within which to evaluate investment and financing decisions for corporations.
Prerequisite (BUSI1002 and STAT1802) or (STAT2310 and STAT2315)

STAT3301 Time-series analysis (6 credits)

A time series consists of a set of observations on a random variable taken over time. Time series arise naturally in climatology, economics, environment studies, finance and many other disciplines. The observations in a time series are usually correlated; the course establishes a framework to discuss this. This course distinguishes different type of time series, investigates various representations for the processes and studies the relative merits of different forecasting procedures. Students will analyse real time-series data on the computer.
Prerequisite STAT2301 or STAT0102 or STAT0604. (Students taking or having taken STAT0801 or STAT2804 are not allowed to take this course.)

STAT3302 Multivariate data analysis (6 credits)

In many designed experiments or observational studies the researchers are dealing with multivariate data, where each observation is a set of measurements taken on the same individual. These measurements are often correlated. The correlation prevents the use of univariate statistics to draw inferences. This course develops the statistical methods for analysing multivariate data through examples in various fields of application and hands-on experience with the statistical software SAS.
Prerequisite STAT0102 or STAT0604 or STAT0801 or STAT2301 or STAT2804

STAT3304 Computer-aided statistical modelling (6 credits)

This is a computer-aided course of statistical modelling designed for the students who have taken STAT2301 Linear Statistical Analysis and like to see theory illustrated by practical computation. Numerous real data sets will be presented for modelling and analysis using statistical software, such as SAS, for gaining hands-on experience. The course also aims to develop skills of model selection and hypotheses formulation for testing, so that questions of interest can be properly formulated and answered. An important element deals with model review and improvement, when one's first attempt does not adequately fit the data. Modern computer software such as SAS makes this interactive approach easier.

Prerequisite STAT2301 or STAT2804 or STAT0102 or STAT0801 (Students taking or having taken STAT3601 are not allowed to take this course)

STAT3305 Financial data analysis (6 credits)

This course focuses on understanding financial data and methods by which they are analyzed and interpreted. It aims at enhancing the students' analytical skills of developing statistical models for analysing financial data. Techniques are motivated by examples and developed in the context of applications. Students will learn how to process financial data for purposes of financial analysis, estimation and testing of financial models and to understand better crucial aspects of financial market movements.

Prerequisite ECON1001 or STAT2309 or (Students taking or having taken STAT2806)

STAT3306 Selected topics in statistics (6 credits)

This course introduces basic statistical concepts and methods which potential graduate students will find useful in preparing for work on a research degree in statistics. Focus is on applications of state-of-the-art statistical techniques and their underlying theory.

Prerequisite STAT0102 or STAT0801 or STAT0604 or STAT2301 or STAT2804

STAT3307 Project in statistics (6 credits)

Each year a few projects suitable for Statistics or Actuarial Science major students will be offered. These projects, under the supervision of individual staff members involve the application of statistics and/or probability in interesting situations. They provide students with practical experience in approaching a real problem, in report writing and in oral presentation.

Prerequisite STAT2301 or (STAT2802 and STAT2804) or STAT0102 or STAT0604 or (STAT2802 and STAT0801). Approval is subject to past academic performance. Availability of this course to Actuarial Science students is also subject to a quota.

STAT3308 Financial engineering (6 credits)

This course aims at demonstrating the practical use of financial derivative products to analyse various problems arisen in financial engineering. Emphases are on the various option pricing formulae, hedging techniques and interest rate models.

Prerequisite 1) STAT2309 or (Students taking or having taken STAT2806) or STAT0109 or STAT0806 (for students admitted in 2004-05 or before); or 2) STAT2315 (for students admitted in 2005-06 or thereafter)

STAT3316 Advanced probability (6 credits)

This course provides an introduction to measure theory and probability. The course will focus on some basic concepts in probability which are essential for students to read research papers in actuarial science, probability and statistics.
Prerequisite STAT2303 or STAT2803 or similar level courses in probability theory.

STAT3317 Computational statistics (6 credits)

This course aims to give undergraduate and postgraduate students in statistics a background in modern computationally-intensive methods in statistics. It emphasizes the role of computation as a fundamental tool of discovery in data analysis, of statistical inference, and for development of statistical theory and methods.
Prerequisite STAT2301

STAT3319 Statistics project * (6 credits)

Each year a few projects suitable for Statistics or Actuarial Science major students will be offered. These projects, under the supervision of individual staff members involve the application of statistics and/or probability in interesting situations. They provide students with practical experience in approaching a real problem, in report writing and in oral presentation.
Prerequisite STAT2301 or (STAT2802 and STAT2804) or STAT0102 or STAT0604 or (STAT2802 and STAT0801). Approval is subject to past academic performance. Availability of this course to Actuarial Science students is also subject to a quota.
* *Offered from 2009-2010. For students admitted in 2007-08 or thereafter only.*

STAT3810 Risk theory (6 credits)

Risk theory is one of the main topics in actuarial science. Risk theory is the applications of statistical models and stochastic processes to insurance problems such as the premium calculation, policy modifications, ruin probability, etc.
Prerequisite (Taking or having taken STAT2803) or STAT2303 or MATH2603 or STAT0103

STAT3811 Survival analysis (6 credits)

This course is concerned with how models which predict the survival pattern of humans or other entities are established. This exercise is sometimes referred to as survival-model construction.
Prerequisite (Taking or having taken STAT2802) or STAT2301 or STAT2801 or STAT0102 or STAT0604 or STAT0801

STAT3812 Stochastic calculus with financial applications (6 credits)

Stochastic calculus has become an essential tool in economics, insurance, finance and econometrics. This mathematical theory is the basis for pricing financial derivatives such as options and futures. This course is designed for students to develop professional skills in stochastic calculus and its applications to actuarial science and finance. Pure mathematical components of the course will be kept at a reasonably low level. The course begins with an overview of the basic concepts from probability theory. Stochastic processes, especially Brownian motion and martingales will be discussed.
Prerequisite MATH2603 or STAT2303 or STAT2803 or STAT0103

Faculty-level courses

SCNC0004 Scientific thinking and interesting discoveries * (3 credits)

The objective of this course is to explore scientific thinking and also its relationship with the process of discovery. To provide an introduction of the logic of scientific thinking that leads eventually to interesting scientific discoveries. The course also emphasizes the appreciation of these discoveries and their implications.
Prerequisite Nil
* *Not offered in 2007-2008.*

Language courses offered to BSc students

School of Chinese

CSCI0001 Practical Chinese language course for science students * (3 credits)

(1) Practical Chinese Writing Skills
    (a) Classical and modern Chinese
    (b) The Chinese language: characteristics and usage
    (c) Basic grammar of modern Chinese
(2) Chinese Characters
    (a) Traditional characters
    (b) Simplified characters
    (c) Variant forms
(3) Letter-writing
    (a) Business letter writing techniques
    (b) Official letter writing techniques
(4) Office Documents
    (a) Notices and announcements
    (b) Proposals
    (c) Minutes and reports of meetings
(5) Chinese for Special Purposes
    (a) Reader-based scientific/technical writings
    (b) Styles and rhetoric of scientific/technical writings
(6) Presentation and Communication Techniques
    (a) Communication and presentation techniques
    (b) Discussion and the art of persuasion

Prerequisite Nil
* *This course is compulsory for all BSc students.*

CSCI0002 Putonghua course for science students * (no credit)

1. To learn the basic characteristics of Putonghua.
2. To learn the terms and phrases commonly used in everyday situations.
3. To learn the glossary in the specific field.
4. To have a better understanding of Chinese culture and people.

Prerequisite Nil
* *This course is available for BSc I students only.*
  Average class size is around 25.

CSCI2002 Advanced language studies in Chinese (3 credits)

(1) To hone students' communicative skills in Chinese. This course aims to improve their reading, listening, writing and speaking abilities in Chinese.
(2) To expose students to different aspects of the language. This course covers a wide range of both linguistic and extra-linguistic subject matters, the knowledge of which would enable the students to use the language in an efficacious way.
(3) To give pre-service language training to students. This course equips the students with language proficiency to get and secure a job.
(4) To promote deeper understanding of Chinese culture. This course identifies areas of Chinese culture that are essential for the students to understand their society better.

Prerequisite CSCI0001

English Centre

ECEN1801 Academic English for science students * (3 credits)

To build confidence in the use of English for writing and speaking about science. The focus is on:

(1) Writing an essay which meets the requirements of good academic writing, in particular making appropriate use of published sources and avoiding plagiarism.
(2) Speaking in an organized and coherent manner.

Prerequisite Nil

* *This course is compulsory for all B.Sc. students.*

ECEN2802 Advanced English for science students * (3 credits)

To develop a sense of audience awareness in writing, to develop spontaneous speaking skills and to individualise language learning. The focus is on:

(1) Writing a short article for one of a range of web journals each with a different audience and topic focus (individual choice).
(2) Spontaneous (i.e. unrehearsed) discussion through participation in speaking workshops and one-to-one discussions.
(3) Developing independent language learning skills to help students address their individual language problems and focus on their future language needs.

Prerequisite ECEN1801

* *This course is compulsory for all B.Sc. students.*