

FACULTY OF SCIENCE



The programmes offered by the Faculty of Science are designed to encourage the creativity and natural curiosity of our students. Our aim is to nurture new generations of scientists who are qualified to pursue a life in the laboratory or in service to the community through careers in public organisations or private industry.

Our two Schools – Life Sciences and Chinese Medicine, and four departments – Chemistry, Mathematics, Physics and Statistics – offer the following 14 undergraduate major programmes (some of the programmes offered are interdisciplinary):

- * **Biochemistry** (offered by the School of Life Sciences)
- * **Biology** (offered by the School of Life Sciences)
- * **Cell and Molecular Biology** (offered by the School of Life Sciences)
- * **Chemistry**
- * **Chinese Medicine** (jointly taught by the teaching staff of the Faculties of Science and Medicine)
- * **Environmental Science** (jointly offered by the School of Life Sciences and Department of Chemistry)
- * **Food and Nutritional Sciences** (offered by the School of Life Sciences)
- * **Mathematics**
- * **Mathematics and Information Engineering** (Double-degree programme jointly offered by the Departments of Mathematics and Information Engineering)
- * **Molecular Biotechnology** (offered by the School of Life Sciences)
- * **Physics**
- * **Quantitative Finance and Risk Management Science** (jointly offered by the Business Administration Faculty's Quantitative Finance Programme and Risk Management Science Programme)

* **Risk Management Science** (offered by the Department of Statistics)

* **Statistics**

From its establishment in 1963, the Faculty's mission has been to train first-class professionals who will have positive impacts on their chosen fields. Our graduates are engaged in business, commerce, education, and government and public administration. A significant number have also opted for careers in research, with 20 per cent, on average, pursuing postgraduate studies either in Hong Kong or overseas each year.

Our academic staff are active in research, and each department/programme has its own graduate division offering programmes that lead to MSc, MPhil and/or PhD degrees. The Faculty also manages the following research centres:

- * Centre for Cell and Developmental Biology
- * Centre of Novel Functional Molecules
- * Centre of Optical Sciences (under the Institute of Optical Science and Technology)
- * Centre for Protein Science and Crystallography
- * Centre for Scientific Analysis of Antique Artifacts
- * Centre for Scientific Modelling and Computation
- * CUHK Zhejiang University Joint Laboratory on Natural Products and Toxicology Research
- * Food Research Centre
- * Guangzhou University of Chinese Medicine – CUHK Joint Laboratory on Chinese Medicine and Health Products
- * Industrial Ecology and Slope Ecotechnology Research Unit
- * Institute of Plant Molecular Biology and Agricultural Biotechnology (which includes the UGC Area of Excellence Centre for Plant and Agricultural Biotechnology)
- * Institute of Chinese Medicine
- * Institute of Mathematical Sciences

- ❖ Institute of Science and Technology (including the Hong Kong Bioinformatics Centre and the Materials Science and Technology Research Centre)
- ❖ Institute of Theoretical Physics
- ❖ Research Laboratory for Food Protein Production
- ❖ Simon F S Li Marine Science Lab
- ❖ State Key Laboratory for Agrobiotechnology (CUHK)
- ❖ Statistical Consulting Services Unit
- ❖ The Biotechnology Laboratory
- ❖ Institute of Biotechnology

Other Faculty initiatives designed to satisfy students' interests in the wider community include outreach activities in secondary schools and in external organisations such as the Hong Kong Science Museum, where our lecturers often deliver popular science lessons for students and the public. Our summer seminars and study camps for secondary school teachers are also popular.

The Quality Education Fund has commissioned the Faculty to organise Science Enrichment Programmes that provide S3-4 students with opportunities to explore and develop their analytical skills. All of these initiatives have proved extremely popular.

CHEMISTRY

Chemistry is a central science situated between physics, mathematics and earth science on the one hand and the life sciences and medicine on the other. Chemistry has traditionally encompassed five major areas: analytical, inorganic, organic, physical and theoretical Chemistry. The integration of two or more of these areas has given rise to more specialised chemistry fields, such as bioinorganic chemistry, organometallic chemistry and polymer chemistry.



The chemistry major programme provides basic training in the discipline. It is meticulously organised to place equal emphasis on theory and application. Students are also given ample training in logical thinking and are required to take the following courses, in addition to related laboratory courses, early on in their studies:

- Analytical Chemistry
- Fundamentals of Spectroscopic Analysis

- Main Group Chemistry
- Basic Principles and Hydrocarbons
- Thermodynamics and Chemical Equilibrium
- Chemical Safety and Practices

These courses cover the common analytical tools used in chemistry, various spectroscopic methods and their application to the identification of chemical compounds, the structure, bonding and properties of organic and inorganic compounds, and essential knowledge in chemical safety. Tools in Physical Chemistry is a required course that aims to strengthen students' mathematical and statistical knowledge. Upper-year students are required to take the following courses:

- Chemical Bonding
- Transition Metal Chemistry
- Alcohols, Ethers, Carbonyl Compounds
- Amines, Arenes and Heterocycles
- Chemical Kinetics
- Molecular Spectroscopy
- Instrumental Analysis

These courses are continuations of the fundamental courses taken in the first year of attendance. The laboratory courses related to these more advanced courses intentionally focus on modern chemical technology.

Final-year students are required to choose three courses from a variety of undergraduate electives according to their interests. The introduction of Problem-based Learning I/II in the final year allows students to work in groups on different projects throughout the year, which provides them with training in solving practical problems, teamwork, writing reports and presentation skills. Students are also offered a range of advanced elective courses to broaden their knowledge of contemporary mainstream chemistry. Those with good grades may choose to carry out a research project under the supervision of a professor. The experience gained through research helps to cultivate independent thinking and critical judgment and prepares students for further studies in chemistry.

CHINESE MEDICINE

This programme is offered by the School of Chinese Medicine in conjunction with the Faculties of Science and Medicine. Its aim is to produce Chinese medicine practitioners who are grounded in life science and medical knowledge and are also well-versed in the theory and practice of Chinese medicine. Students are expected to integrate modern medical knowledge with traditional Chinese medicine approaches.

The five-year programme consists of pre-clinical study and clinical training. The former includes subjects in basic medical and life sciences, the principles of Chinese medicine applications, Chinese medical concepts and theories, Chinese medicine classics and various specialties in Chinese medicine (such as internal medicine, gynaecology, paediatrics, orthopaedics, acupuncture, etc.) among other courses.

During the second part of the programme, students attend Chinese Medicine out-patient clinics in Hong Kong and/or mainland China. In the first nine months of students' clinical

training, classes and bedside teaching are held at Chinese Medicine hospitals in the mainland to cover the various aforementioned specialties.



Upon satisfactory completion of the programme, a Bachelor of Chinese Medicine degree is conferred, and graduates are qualified to take the Chinese Medicine Practitioners Licensing Examination conducted by the Chinese Medicine Practitioners Board of the Hong Kong Chinese Medicine Council.

MATHEMATICS

The Mathematics programme has three objectives:

- (1) to provide comprehensive training in mathematics and cultivate students' analytical power, thus allowing them to realise their potential in various academic and professional arenas;
- (2) to introduce students to the application of mathematics in various areas, such as information technology and finance, thus equipping them for a wide range of careers; and
- (3) to explore the latest developments in mathematics with the aim of producing experts in mathematics research.

The Mathematics Department offers a wide range of courses in both pure and applied mathematics. Students can choose to specialise in one of three streams: Mathematics, Computational and Applied Mathematics, and the Enrichment Stream in Mathematics.

Students are required to fulfil basic course requirements during their first year. Thereafter, they have the flexibility to choose elective courses based on their own interests and stream orientation.

In the area of pure mathematics, the topics on offer include number theory, abstract algebra, real and complex analysis, functional analysis, differential geometry, topology and differential equations.

In the area of applied mathematics, the topics on offer include probability, financial mathematics, operations research and logistics, optimisation theory, game theory, coding theory, and cryptography and numerical analysis. Qualified

undergraduates may take mathematics courses at the graduate level.

A double-degree programme in Mathematics and Information Engineering was recently launched to enable students to develop in-depth mathematical thinking and solid engineering skills at the interface between mathematics and information technology.

Our curriculum is highly flexible and offers a wide range of application courses without time-consuming laboratory work. Students are also awarded a high degree of freedom in preparing for their favourite minor programmes. The most popular choices are computer-related programmes, business administration and economics. With their strong mathematics background, our students not only understand the methods used in these applications but also possess a deeper understanding of the theories therein. This solid grounding provides them with a good pathway to succeed in these areas and to continue their studies at the Master of Philosophy level.

The Department offers ample summer training opportunities and allows students to take their project course during the summer months to gain the required credits, which also alleviates their school term workload. Students are also encouraged to expand their horizons by engaging in summer programmes at overseas universities. Moreover, with the generous support of a number of companies, organisations and schools, we run an internship programme designed to prepare our students for the rigours of the workplace. These opportunities broaden our students' career perspectives while supplying the education sector with young blood.

The Department is actively engaged in research, thanks in part to the University's Institute of Mathematical Sciences, which is headed by world-renowned mathematician Professor Yau Shing-tung. In recent years, the Institute has collaborated with leading research institutes across the globe, including the Academia Sinica. The Enrichment Stream in Mathematics provides focused training for undergraduates who are interested in mathematical research and takes advantage of the Institute's academic activities.

PHYSICS

Physics is the study of the basic regularities that underlie the various complex phenomena of the physical world. The scope of this discipline ranges in scale from the tiniest, such as the quarks in a proton, to the largest – the entire universe. The objective of the Physics programme is to enable students, through lectures, laboratory work, group discussions and various student-centred learning opportunities, to gain a good grasp of the fundamentals of the subject and its general study methods and to come to appreciate and understand its important applications in modern society.

The core of the major programme – a required module that is intended to build a solid foundation in the discipline – consists largely of courses in classical and modern physics. Newtonian mechanics and electromagnetism, supplemented by thermodynamics and optics, constitute classical physics,

whereas quantum mechanics, as well as its simple application to an understanding of the behaviour and structure of matter at various levels, constitutes modern physics.

Depending on their needs and aspirations, students are also free to select courses from two streams – Physics and Theoretical Physics. The latter, which is an enrichment stream, is particularly suitable for those interested in further study.



Courses in astronomy, relativity, astrophysics, computer simulation, meteorology, solid state physics, soft matter physics, plasma physics, laser physics, quantum communication and computation, photonics, electronics, instrumentation, materials characterisation and nanoscience are available as electives to fulfil students' major requirements and to satisfy their own interests. They may also undertake physics projects and graduate courses.

A large number of our graduates opt to pursue postgraduate study. In recent years, half have chosen to continue their education either locally or overseas. Those who have chosen to study overseas have been accepted by world-renowned institutions.

RISK MANAGEMENT SCIENCE

The Risk Management Science programme, which is administered by the Department of Statistics, is designed for students with a strong interest in scientific methodologies who are seeking careers in financial and insurance institutions. Students are specially trained in the quantitative approach to the modelling, assessment and valuation of risk management.

Statistics constitutes an indispensable component of risk management, as it provides the theoretical and practical underpinnings for the discipline's models. As risk management is interdisciplinary, students in the programme not only receive solid training in statistics, but also gain comprehensive exposure to other subjects such as finance, economics, accounting, mathematics and computer science. The core programme comprises courses from various departments, including numerical methods, portfolio management, financial economics, data structures and accounting principles.

STATISTICS

Statistics comprises a collection of methods used to design experiments and gather data, and then summarise, present, analyse and interpret those data and draw conclusions based on them. Statistics is thus fundamental to all fields of natural science, medical science, social science, business and engineering in which the quantitative analysis of data is essential. Thanks to the remarkable increase in the supply of data in the information technology era, the demand for statistics professionals has never been greater.

The objectives of the Statistics programme are to equip students with the statistical theories and methods necessary to help them master real-life statistical applications and prepare them for promising careers. To achieve these objectives, the programme's curriculum is equally divided between application and theory. Students are given the flexibility to select either the Data Science and Business Statistics Stream or the Statistical Science Stream.

Statistics courses can be broadly classified into five categories:

- (1) Foundations of Statistics
- (2) Computing and Data Management
- (3) Statistical Theories and Methods
- (4) Statistical Applications in Business, Forecasting, Biostatistics, Actuarial Science and Quality Control
- (5) Risk Management Science

Students are also required to take part in workshops, conduct case studies and work on statistics projects under the supervision of teaching staff to sharpen their statistical skills and acquire experience in handling real-life problems.

MATHEMATICS AND INFORMATION ENGINEERING

This programme is offered jointly by the departments of Mathematics and Information Engineering to provide students with diversified and advanced knowledge in the interdisciplinary study of mathematics and engineering. It covers a broad range of subjects to provide solid training in both fields. The career opportunities for the holders of this dual degree are particularly diverse and include teaching/research in mathematics and theoretical engineering and industrial engineering practice.

The programme awards two degrees following four years of study: a BSc in Mathematics (Information Science) after the regular three years of study and then a BEng in Information Engineering after the optional fourth year, with the fourth year of the programme being offered on a self-financing basis. For entrants who have completed only six years of secondary education, both degrees are awarded after four years of study.

LIFE SCIENCES PROGRAMMES

In 2009, the Faculty of Science launched the Life Sciences Board-based Admissions Scheme to assist students in identifying their interests in various fields of the life sciences prior to declaring their majors. The scheme encompasses six major programmes, including the following:

- Biochemistry
- Biology
- Cell and Molecular Biology
- Environmental Science
- Food and Nutritional Sciences
- Molecular Biotechnology

Each programme offers unique education and training in its respective field and prepares students for versatile careers and further postgraduate studies in biological, biomedical and health sciences and related areas. In their first year of study, students admitted to the Life Sciences programmes take not only the mandatory courses in fundamental biochemistry and biology, but also other courses that introduce the basics in the six distinct areas of life sciences, according to their preferences. Students can make use of this scheme, which provides flexibility and sufficient time to explore and foster their interests in these highly specialised areas, before they declare their preferred major by the end of the first academic year.

Biochemistry

Biochemistry is a branch of science that investigates, at the molecular level, the chemical compounds and processes that occur in living organisms. The curriculum examines the cellular control of life processes, bioinformatics, the metabolism of biomolecules and their regulation, energy transformation, the functions of enzymes and the structure-function relationship of many enzymes and proteins, genome research and genetic diseases, heredity and evolution, the action mechanisms of the nervous, immune and endocrine systems, biotechnology, and biomedical sciences. The knowledge procured from research in these areas has found extensive application in medicine, the biotechnology industry and our daily lives.

In common with the other life sciences programmes, the first-year curriculum begins with the fundamental concepts of the life sciences, including cell biology, biomolecules, and basic communication and research methodology. In the second term of the first year, students take *Frontiers in Biochemistry*, which explores current topics in biochemistry and molecular biology that have scientific, medical and social significance. This course stimulates students' interest in biochemistry by introducing them to the latest developments in these fields and by exploring their relevance to daily life and biomedical research. The second- and third-year curriculum systematically delves into the more complex and advanced aspects of biochemistry, from protein, metabolism, bioenergetics and molecular biology to methods of biochemistry, including recombinant DNA techniques. Teaching revolves around lectures, tutorials, practical classes,

research projects, collaborative learning, and computer-aided and web-based teaching. All courses are conducted in English. To enhance students' self-learning capability and develop their independent research ability, we also offer self-study modules in biochemistry in the second year.

Students who did not have enough training in biology or biochemistry at the secondary school level may take an elementary biochemistry course, *Biochemical Aspects of Health and Disease*, which provides a sound foundation in the subject. This elective course is designed for students who lack A-level training in biology, and familiarises them with the basic concepts of biochemistry, nutrition and human metabolism.

Core courses are divided into two categories: general biochemistry and specialised topics in biochemistry. *Bioenergetics and Metabolism* scrutinizes the principle of biological energy transfer and the various biochemical processes that are related to energy transformation and cellular metabolism. *Protein and Enzymes* investigates the structure and function of proteins and enzymes, and illustrates the catalytic mechanisms of enzymes. *Methods in Biochemistry* provides training in the applications of basic techniques and biochemical methods in the purification, qualitative study and quantitative analysis of biomolecules. *Molecular Biology* delves into the structures of genes and chromosomes, as well as other aspects of gene regulation and expression, and *Recombinant DNA Techniques* deals with genetic engineering techniques. Many of these courses are accompanied by a laboratory course.

We also have a compulsory course, *Self Study Modules in Biochemistry*, to train students their self-learning capabilities and presentation skills. Another course for research is an elective course *Research Internship*, which requires students to carry out research projects in a local or overseas laboratory. In *Guided Study in Biochemistry* or *Supervised Research in Biochemistry*, which are taken in the final year, students are required to make an oral presentation and submit a report based on a literature review of current topics or research work conducted under the supervision of a Faculty advisor.

In addition, students enrol in more advanced and specialised biochemistry courses according to their interests. The organisation and development of the immune system and its functions in health and disease are addressed in *Basic and Applied Immunology*. *Molecular Endocrinology* provides an understanding of the biochemical aspects and physiological functions of various animal hormones. *Clinical Biochemistry* deals with the assays of various biochemical constituents and their relationships with diseases. The structure, organisation and functions of the nervous system are discussed in *Aspects of Neurosciences*. *Microbial Biotechnology* explores aspects of modern biotechnology, such as the application of fermentation, enzymology, protein engineering and the like. Laboratory sessions are run in conjunction with lectures for these elective courses.

The Department's teaching facilities are located in the Mong Man Wai Building, which has more than 600 square metres

of space devoted to state-of-the-art teaching laboratories. Moreover, through the adjunct professors from the Faculty of Medicine, our programme has strong ties with biomedical research and training in medical techniques.

In addition to academic training, the Department also organises extracurricular activities that are designed to enhance the intellectual and social skills of our students. These include visits to local and mainland biotechnology companies, career development workshops, summer overseas research exchange programmes, summer research programmes and summer internship programmes.

Biology

As the study of life, biology plays a significant role in the health and wealth of nations. Our Department's mission is to generate and transfer knowledge, train and cultivate brilliant scientists, and nurture our students to become all-round citizens dedicated to serving society.

To achieve this mission, we emphasise both research and education. Over the past 40 years, we have attracted a large group of distinguished scientists and educators. Today, all 24 of the professors, and most of the instructors, who serve the Department gained their PhD degrees and postdoctoral training at prestigious international universities. Our research facilities are also of an international standard, comparable to leading universities in North America and Europe.

Our strength in innovation has attracted major funding from the University Grants Committee, and we are recognised as an Area of Excellence (AoE) in Plant and Agricultural Biotechnology. In collaboration with major national and international scientific institutes, our AoE centre employs state-of-the-art technologies to tackle major agricultural and health problems. The centre also allows our Department to participate in the China National Programme of Rice Functional Genomics, meaning that our scientists are responsible for the crucial development of seed quality in rice production.

Our Marine Biotechnology research programme is also recognised by the University as a strategic research area. In addition to these programmes, we conduct research in a number of other important areas, including immunology, molecular endocrinology, food and nutritional sciences, traditional Chinese medicine, ecology, and environmental biotechnology. As well as making a contribution to the community – at the local, regional and international levels – the research we undertake plays an integral role in our educational programmes. By taking part in cutting-edge projects, our students gain vital, hands-on research experience.



The Biology undergraduate curriculum is structured to provide a solid foundation in biological sciences, followed by a wide choice of specialisations that can be chosen from more than 25 courses. Apart from nine fundamental classes that are compulsory, students are free to select from a broad spectrum of courses according to their interests.

In brief, our courses explore life phenomena from various perspectives, including (1) the global interactions of different biological communities; (2) whole organism structures, development, physiology and functions; (3) individual cells, cellular components and functions, and the signal transduction therein; and (4) the biochemical, genetic and molecular basis of life.

To cope with the rapidly evolving demands of biotechnology, we also offer Molecular Biology and Genetic Engineering, Microbial Biotechnology, Plant Biotechnology, Environmental Biotechnology, and Bioinformatics and Proteomics.

Students with a special interest in human biology may choose to enter the Human Biology stream (which is jointly offered with the Faculty of Medicine at CUHK) upon completion of their first year of study. Others may specialise in one of the fields within the Biology stream, such as marine and environmental biology, molecular biology and biotechnology, or conservation and biodiversity, and choose teaching as a career.

Following graduation, many of our students play influential roles in society. Although many go on to prove themselves important assets in public and private enterprises – serving as high school teachers and in government bodies and working in the biotechnology industry or the social or commercial sectors – many others choose to continue their studies at the postgraduate level. We offer both MPhil and PhD degree programmes for qualified students, and we also encourage our graduates to gain international exposure by studying abroad and taking part in internship and exchange programmes.

Many graduates who are eligible for fellowships or assistantships have been admitted to the PhD programmes of such world-class universities as UC Berkeley, Stanford, Cambridge, Oxford and the University of Heidelberg.

Our track record of producing excellent scientists (including the current Vice-Chancellor of the University of Hong Kong) is widely recognised. For example, more than 30 of the Department's alumni are now serving as professors in universities throughout Hong Kong.

Cell and Molecular Biology

As one of the major internationalised cities in China, Hong Kong is becoming a national and international research centre for biomedical sciences at an unprecedented pace, which has generated an increasing demand for talent in this field. The Cell and Molecular Biology Programme, which was launched in 2008, aims to prepare students for professional careers in the fields of modern biological and biomedical sciences through an innovative curriculum.



We offer a research-intensive programme that focuses on the fundamental aspects of cell and molecular biology. Our major research directions include cell structure and function, cell signalling, molecular biology, developmental biology, stem cell biology and neurobiology. Various well-recognised cell systems such as stem cells and top model organisms such as *Drosophila* and mice are used to exemplify the basic principles and questions in these fields.

To allow them to better appreciate the advances in the field, our students are required to enrol in courses that introduce important underlying concepts of cell and molecular biology. Moreover, two core programme laboratory courses are offered for the most important and up-to-date techniques in this area of study. These courses also provide essential training in experimental design, sample preparation, data acquisition and analysis, as well as in technical writing.

To further broaden students' exposure to and understanding of contemporary topics in cell and molecular biology, we also offer various advanced-level one-unit bundle courses. Each of these one-unit courses delineates a current issue in cell and molecular biology based on the latest developments. The modular form of the courses allows swift and flexible adjustments to the content, thus allowing us to keep pace with the rapid advancement of the cell and molecular biology arena. These advanced topics cover the study of genomics, transcriptomics, metabolomics, cancer cell biology, stem cell biology and neuronal cell biology.

In addition to lecture and laboratory courses, a crucial highlight of our curriculum is the innovative implementation of three coherent student-orientated teaching (STOT) courses. The first- and second-year STOT courses are mandatory, and each student is supervised by a member of our teaching staff to carry out an independent project. These courses provide intensive training in information analysis, critical thinking skills, creative writing and scientific communication on a small group or one-on-one basis, rather than in a classroom format. An optional third-year STOT course, which is similar to the traditional final-year project, offers hands-on experience in a research laboratory.

Through the acquisition of solid subject knowledge and laboratory skills, our graduates are expected to possess all-round competence, a spirit of teamwork and various capabilities that will advance their career prospects in and beyond the field of cell and molecular biology.

As the only local programme that focuses on the study of cell and molecular biology, our programme has the goal of becoming a regional education centre with international recognition for superior professional training and a premier hub for cutting-edge research in the fields of cell biology, molecular biology, developmental biology and neurobiology.

Environmental Science

The Environmental Science Programme was launched to meet the demand for trained professionals in environmental protection and conservation. Environmental Science is an integrated science that utilises the knowledge and skills of applied biochemistry, biology and chemistry to test, assess and resolve environmental problems.

The Programme's basic courses cover the Fundamentals of Biochemistry, Cell Biology, Ecology and Introduction to Environmental Science. More specialised subjects, including Environmental Chemistry, Biochemical Toxicology, Environmental Instrumentation Techniques and Environmental Impact Assessment, are provided to nurture an all-round interest in environmental science. This prepares students for specialised study in the following areas: (1) environmental health and toxicology, (2) environmental management and environmental conservation, and (3) environmental chemistry, pollution control and monitoring. Students are required to select 18 units of major elective courses, including courses from the Department of Geography and Resource Management and the Public Health Programme, such as Urban Environmental Problems, Hydrology, Eco-Tourism, Epidemiology, Biostatistics, and Environment and Work. Other elective courses that offer training in biodiversity, marine biology, methods in toxicological research and advanced chemistry are available. Students are also encouraged to graduate with a minor in either Geography and Resource Management or Public Health.

Students who opt for this programme can also choose to conduct supervised research in their chosen area of environmental science or carry out a literature review on a special field within it or participation in field trips overseas. Such training fosters their understanding and integration of research in environmental science and enhances their report writing skills. Field trips and internship courses are also available. All of these courses are aimed at strengthening and integrating students' knowledge of the subject area and improving their ability to write research reports. Graduates may go on to pursue careers in environmental science and related fields, or they may take up postgraduate studies in various areas of research in Environmental Sciences and Management.

In addition, the programme organises extracurricular activities designed to enhance the intellectual and social skills of our students. These include many site visits to local and mainland

environmental facilities, career development workshops, and summer research internship programmes.

Food and Nutritional Sciences

The curriculum of the Food and Nutritional Sciences programme covers food safety and toxicology, food microbiology, food preservation, food product development, food analysis, quality assurance, human nutrition, nutrient metabolism, introductory dietetics and community nutrition.

The programme is designed to produce graduates who are well versed in scientific health and in the technical issues of the food and nutritional sciences. Graduates are qualified for careers in the industrial and commercial sectors, government and private health services, and food service organisations, as well as prepared for public service.



The two integrated parts of the programme – food science and nutritional science – systematically familiarise students with the professional and practical aspects of both. In addition to Food, Nutrition and Health, students also begin their studies with Human Physiology, Genetics, Microbiology and Basic Biochemistry, among others. These courses prepare them for the more in-depth study of food and nutritional sciences. Students may then choose from a range of specialised food and nutritional science courses and conduct their own directed research on a relevant topic under supervision.

Molecular Biotechnology

Molecular biotechnology is a modern interdisciplinary field with widespread application that has made significant contributions to industry, agriculture, the environment and medicine. The Molecular Biotechnology programme is offered to meet the growing demand for biotechnology expertise.

This programme provides students with integrative training. Undergraduates are first required to develop a basic understanding of biology, biochemistry, cell biology and genetics, and then to gain hands-on experience and basic skills through laboratory classes. They are also expected to acquire the fundamentals of biomolecules, genetics, cells and organisms.



In the upper years, the programme focuses on the core of molecular biotechnology, with specialised courses on methods in biochemistry, molecular biology and genetic engineering, microbial biotechnology, plant biotechnology, animal biotechnology, protein biochemistry, proteomics and bioinformatics.

Molecular biotechnology is a rapidly evolving technical- and application-oriented area. Methods in Molecular Biotechnology introduces students to the latest methodology and technology, and the programme also addresses the business and social aspects of biotechnology, such as government policy, management, licensing, and ethical and public concerns. In their final year, students undertake a supervised research project or a senior literature seminar to enhance their professional training in molecular biotechnology.

QUANTITATIVE FINANCE AND RISK MANAGEMENT SCIENCE

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