



THE HONG KONG  
UNIVERSITY OF SCIENCE  
AND TECHNOLOGY

# SCHOOL OF SCIENCE

## UNDERGRADUATE EDUCATION

# MESSAGE FROM US

Welcome to the School of Science at HKUST!

At the School of Science, we promote a vigorous and dynamic learning environment with continuous enhancement of our curriculum. Aside from the conventional science programs, we have designed several programs that are diverse, interdisciplinary and inquiry-driven to meet the demands of the ever-changing society.

Outside the classroom, our students enjoy a wide range of learning opportunities such as overseas exchange programs, mentorship and internship programs, social service activities, career advising and personalized support. Such co-curricular programs and activities broaden students' horizons and help realize their holistic development.

Our programs emphasize flexibility and creativity, and they are structured to equip our students with the skills, knowledge, and

confidence to become inspirational leaders and independent thinkers. With a strong commitment to both teaching and research, they instill in our students the importance of scientific rigor and ethics, while as mentors they serve to inspire and encourage our students to achieve their full potential.

The School's commitment to quality and excellence remains as strong as ever. The School's past successes have established an excellent foundation enabling us to move forward and to embrace change. By strengthening our ties with the local community, and working closely with other leading institutions globally, the School further enhances our contributions to science. I hope you will join us as we continue to advance the frontiers of science research and education!

# INTRODUCTION TO SCHOOL OF SCIENCE

Join HKUST, a top university in Asia, where academicians gather, educators inspire, creative minds thrive and young leaders bloom. You will grow in this vibrant and exciting community and you will fly high when you leave.

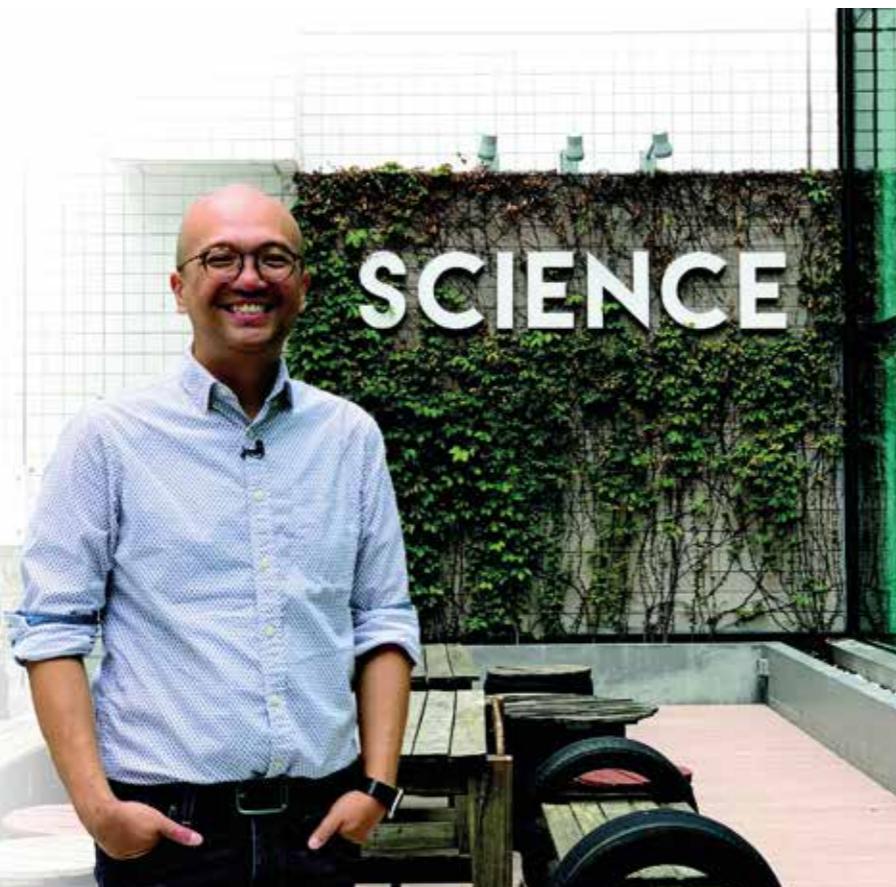
The School of Science is committed to pursuing cutting-edge research, making groundbreaking discoveries and establishing new research paradigms. Our quality and well-balanced education places particular emphasis on grit, curiosity and creativity. We are dedicated to equipping our students with the knowledge and confidence to be inspirational leaders who are capable of making a difference to society.

At the School of Science, we are proud of our exceptional academic departments, distinguished faculty, challenging yet inspiring academic programs, achievements in research and development, and state-of-the-art research facilities.

High quality education requires dedicated educators. The School of Science has recruited outstanding faculty members, many of whom are leaders in their research fields and have already attained international stature in recognition of their scientific contributions. With their different backgrounds and research interests, they bring diverse, interdisciplinary perspectives to address the fundamental questions in science. They have also helped raise the School's research profile such that it stands out among major research institutions globally.

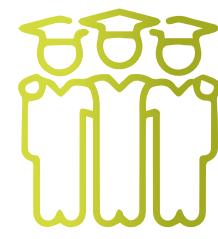


**Prof. Shing Yu LEUNG**  
Associate Dean of Science



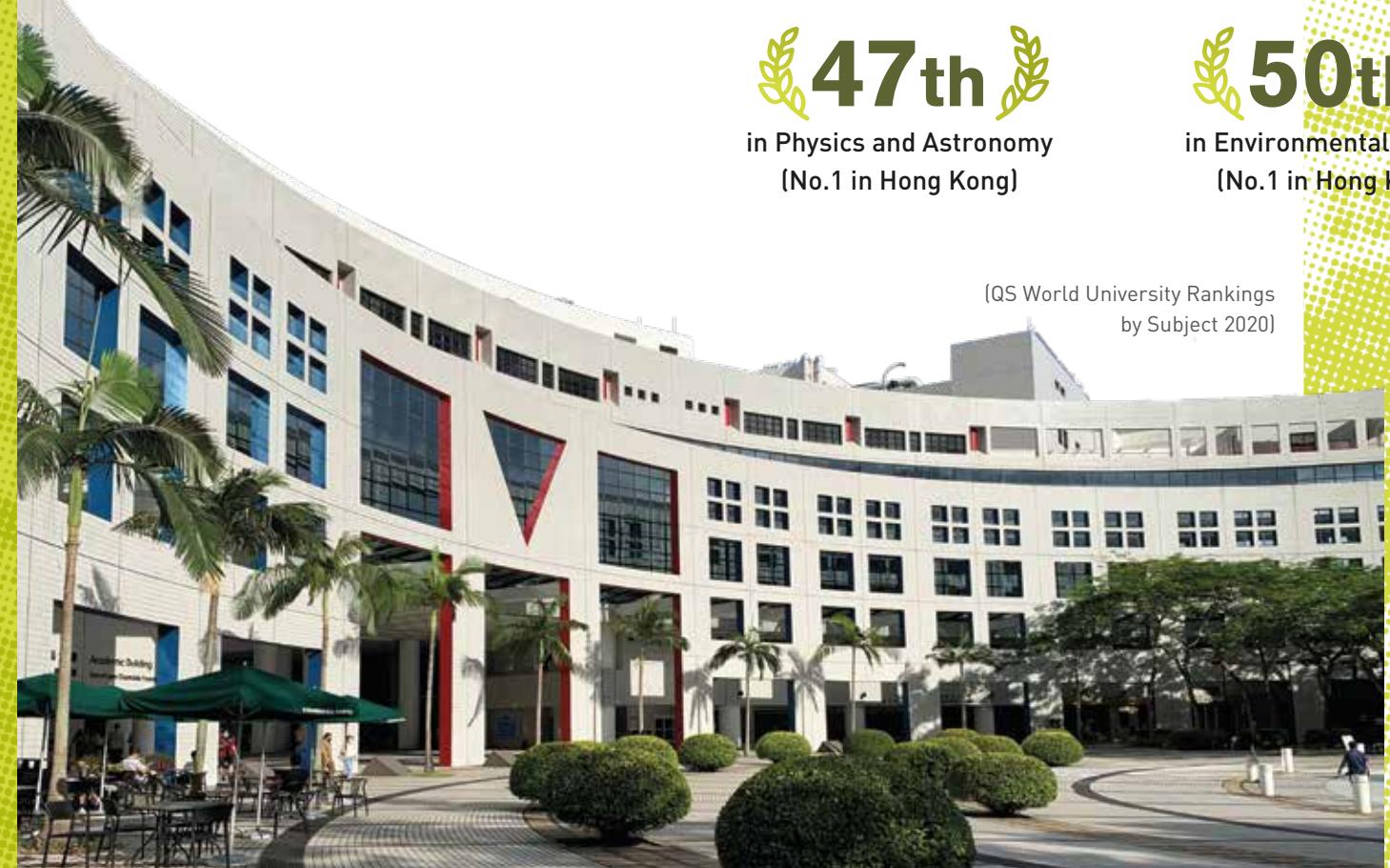
## World-class Research Facilities

- State Key Laboratory of Molecular Neuroscience
- Hong Kong Branch of Chinese National Engineering Research Center for Tissue Restoration and Reconstruction
- Biotechnology Research Institute
- William Mong Institute of Nano Science and Technology
- Joint KAUST-HKUST Micro/Nanofluidics Laboratory
- GSK R&D China-HKUST Neuroscience Laboratory
- Sino-German Nano-Analytical Laboratory
- Ocean Research Facility
- Center for Cancer Research
- Center for Chinese Medicine R&D
- Center for Fundamental Physics
- Center for Metamaterials Research
- Center for Quantum Materials
- Center for Scientific Computation
- Center for Space Science Research
- Center for Statistical Science
- Center for Stem Cell Research
- Center for Systems Biology and Human Health
- Molecular Neuroscience Center
- SSCI-IAS Super-Resolution Imaging Center



**2,200+**

Undergraduate Students of  
**60+** Nationalities



**150+**

Faculty Members

**23rd**

in Materials Science  
(No.1 in Hong Kong)

**29th**

in Chemistry  
(No.1 in Hong Kong)

**34th**

in Mathematics  
(No.2 in Hong Kong)

**35th**

in Statistics and Operational Research  
(No.1 in Hong Kong)

**40th**

in Natural Sciences  
(No.1 in Hong Kong)

**47th**

in Physics and Astronomy  
(No.1 in Hong Kong)

**50th**

in Environmental Studies  
(No.1 in Hong Kong)

(QS World University Rankings  
by Subject 2020)

# PROGRAM OVERVIEW

## School-Based Admission

The School-based programs at the School of Science provide an invaluable opportunity for students to have a deeper understanding of various aspects of science and their personal interests before they decide on their majors. The goal is to offer a more diverse, interdisciplinary, and inquiry-driven undergraduate education to students interested in science. Students can enjoy high flexibility in major and minor choices in accordance with their aspirations.

The programs aim at nurturing young scientists who can contribute to the betterment of mankind with advanced scientific knowledge. Students will be equipped with the necessary knowledge and skills to engage in activities demanding scientific thinking, analysis and task execution, so that they can excel in their future professions including research and development, education, manufacturing, logistics, and business and finance.

The School has particularly placed enormous efforts and resources on designing its laboratory and signature courses with the aim of nurturing students' competency in experimental methods and logical analysis, which are the two indispensable pillars of scientific method. In addition to rigorous academic training, we give equal emphasis on students' personal development. A wide range of co-curricular activities and training are provided to further enrich students' university experience. These include but are not limited to student exchanges, undergraduate researches, internships, community services and engagement programs designed for the School of Science students only.



The School of Science offers two program choices – **Science (Group A) Program** and **Science (Group B) Program**. Science (Group A) Program is tailor-made for students who are interested in the fields of physical sciences. Science (Group B) Program is more suitable for students who are interested in the fields of chemistry and life science.

## Science (Group A) and Science (Group B) Programs

Under school-based admission, students admitted into the School of Science upon completion of the first year of study will enroll into one of the following degree programs:

### Science (Group A) Program:

- BSc in Mathematics
- BSc in Physics
- BSc in Data Analytics in Science
- BSc in Data Science and Technology\*
- BSc in Mathematics and Economics\*
- BSc in Risk Management and Business Intelligence\*

### Science (Group B) Program:

- BSc in Biochemistry and Cell Biology
- BSc in Biological Science
- BSc in Biotechnology
- BSc in Chemistry
- BSc in Biotechnology and Business\*
- Dual Degree Program in Technology and Management (BSc & BBA) #

### Both Science (Group A) and Science (Group B) Programs:

- BSc in Ocean Science and Technology
- BSc in Environmental Management and Technology#
- BSc in Individualized Interdisciplinary Major#

\* Joint School Programs

# Programs offered by Interdisciplinary Programs Office

## Program Structure

Students admitted to Science (Group A) and Science (Group B) programs can opt to declare their corresponding majors offered by the School of Science, as well as the Joint School Programs and the programs offered by Interdisciplinary Programs Office, upon completion of the first year of study.

Most science major programs offer different study tracks and options, while providing opportunity for double majors and minors. The study tracks and options provide students with opportunities to deepen their understanding of the major discipline, which will be useful for graduate degrees in the future. The additional major and minor allows students to

leverage on synergy between the academic disciplines. It is possible for students to take various combinations of majors, not only within the School but also across the Schools.

The program flexibility caters students of diverse academic and career aspirations, and meanwhile ensures the students to have a solid foundation and adequate exposure to a range of science disciplines.

# PROGRAM OVERVIEW

## Year 1

Students will enroll in science foundation courses according to their interests and background, as well as courses in other areas to fulfill the University Common Core requirements.

1

**120 Credits**

Minimum credit requirement for graduation:

## Year 2-4

Students will declare a major program in their second year. They may also consider declaring a minor program in order to add a secondary area of focus to their studies.

2



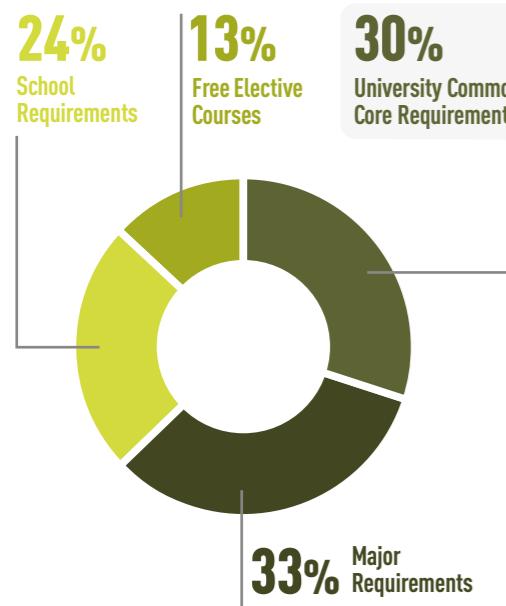
3

4

**4 Years**

Normative period of study:

## 4-Year Curriculum



Common Core Area:	Total credits required: 36 credits
Humanities (H)	3
Social Analysis (SA)	3
Science and Technology (S&T)	3
Quantitative Reasoning (QR)	3
Core Electives	6
English Communication	6 (to be completed in the first year of study)
Chinese Communication	3
Healthy Lifestyle (Non-credit bearing)	Credit(s) 0 1 2 3 4 5 6

\*At least 3 credits must be taken from school-sponsored courses listed for the respective common core area.

**School-Sponsored Courses (SSCs)** are Intended to be hallmark courses of the offering Schools and be representative of the uniqueness and values of the Schools.



## International Research Enrichment (IRE) Program

The International Research Enrichment (IRE) program is designed for students interested in pursuing a research career in science, or broadening their exposure to research during their undergraduate studies. It emphasizes curiosity and grit, which are the essential attributes to a successful career in scientific research.

The IRE program has similar curriculum structure as the Science (Group A) and Science (Group B) programs. But it distinguishes itself from the regular science program by providing students the following:

- Free choice of major programs among Biochemistry and Cell Biology, Biotechnology, Chemistry, Mathematics, Ocean Science and Technology and Physics
- Participation in advanced research projects under the supervision of world-class professors
- Opportunities to meet Nobel Laureates and renowned scientists
- Individualized research guidance and mentoring from experienced faculty members
- Undergraduate Research Opportunities Program (UROP)
- Exchange and internship opportunities in renowned foreign universities / research institutes
  - Summer research internship opportunity in foreign universities and institutions
  - Scholarship support for overseas learning trips

## Career Prospects

Building upon the premise that exposure to international research environments at an early stage is essential to a fruitful research career, the program offers outstanding science students the opportunity to nurture their research abilities and solidify their discipline-specific knowledge in regular science programs. Most of the graduates will pursue further studies in renowned universities around the world.

## Majors and Minors

### Major Programs

The School of Science offers the following major programs:

- BSc in Biochemistry and Cell Biology (BCB)
- BSc in Biological Science (BISC)
- BSc in Biotechnology (BIOT)
- BSc in Biotechnology and Business (BIBU)<sup>1</sup>
- BSc in Chemistry (CHEM)
- BSc in Data Analytics in Science (DASC)
- BSc in Data Science and Technology (DSCT)<sup>2</sup>
- BSc in Mathematics (MATH)
- BSc in Mathematics and Economics (MAEC)<sup>1</sup>
- BSc in Ocean Science and Technology (OST)
- BSc in Physics (PHYS)
- BSc in Risk Management and Business Intelligence (RMBI)<sup>3</sup>

#### Remarks:

1. Jointly offered by the School of Science and School of Business and Management
2. Jointly offered by the School of Science and School of Engineering
3. Jointly offered by the School of Science, School of Engineering and School of Business and Management

### Minor Programs

Students can enjoy different types of learning experiences by enrolling in various minor programs within or outside the School of Science.

Offered By	School of Science	School of Engineering
Programs	Actuarial Mathematics Astrophysics and Cosmology Biological Science Biotechnology Chemistry Environmental Science Mathematics Physics	Aeronautical Engineering Big Data Technology Bioengineering Design Environmental Sustainability and Management Information Technology Robotics Sustainable Energy Engineering Technology Management

Offered By	School of Business and Management	School of Humanities and Social Science	Joint Schools / Interdisciplinary Programs Office
Programs	Business	China Studies Humanities Social Science	Entrepreneurship <sup>1</sup> Psychological and Behavioral Science <sup>2</sup> Sustainability <sup>3</sup>

#### Remarks:

1. Jointly offered by the School of Science, School of Engineering, and School of Business and Management
  2. Jointly offered by the School of Business and Management and School of Humanities and Social Science
  3. Offered by Interdisciplinary Programs Office
- Availability of the above minor programs is subject to change.

# DATA ANALYTICS IN SCIENCE (DASC)

## Program Overview

We are surrounded by massive data in this big data era. A gigantic amount of data is continuously generated and obtained in almost every field in science, technology, and social science. Data Analytics in Science is a new major program offered by the School of Science starting from the 2021/22 academic year. The program is designed for science students who want to learn data analytical skills and practice them in various science disciplines.

The program will introduce our students with various mathematical tools and will show them how to make sense of data. Students will have a chance to see how data analytics has made impacts and has revolutionized different fields in science. Students will not only learn foundation science knowledge, but will also be equipped with competence and skills to analyze, present, and draw sound conclusions from data in context, and ultimately bring these techniques into practice in a data-intensive field in science.



### The program offers four tracks:

- Applied Biosciences Track
- Environmental Science Track
- Information Science Track
- Molecular Science and Cheminformatics Track

Courses in the tracks are not meant to train students to be experts in the corresponding fields, but rather to bring them into the context of a domain of data-intensive research in science.

## Career Prospects

We see tremendous new applications of data analytics these years. In the business world, techniques from data analytics help draw sharper insights into their customers and daily operations. One can improve the manufacturing and computational efficiencies in industry and IT fields using modern technologies from data science. In Fintech, we see that data analytics can effectively predict the stock price, design new financial

products, detect fraud transactions, etc. Graduates with training in data analytics are, therefore, of extremely high demand in today's job market. Since the program not only provides students with hands-on skills but also practical mathematics background and data analytical tools, our graduates will be well-equipped to meet their future career challenges in any field of data science.

# MATHEMATICS (MATH)

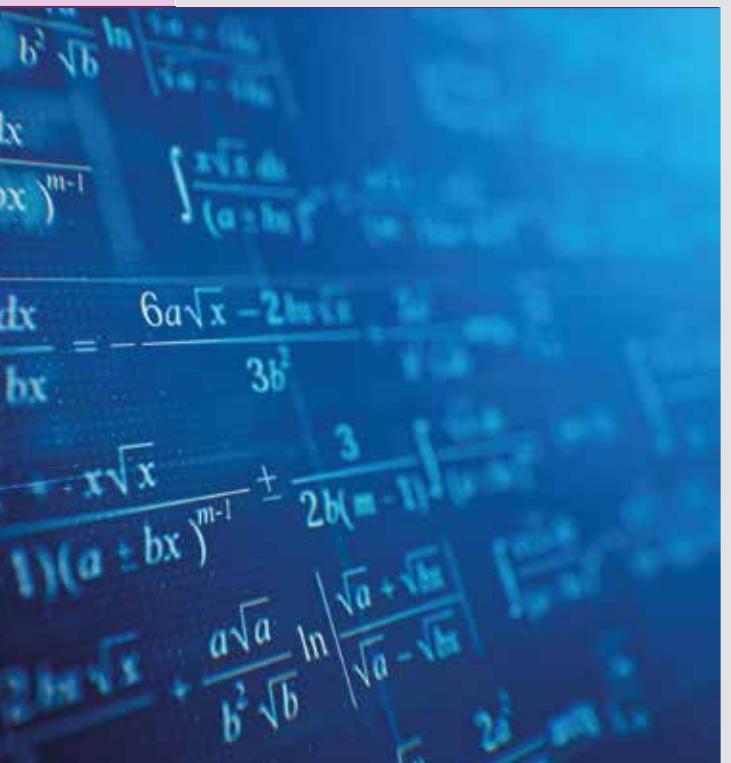
## Program Overview

Mathematics permeates almost every discipline of science and technology. It is not only a tool for understanding the abstract models of real world phenomena while solving practical problems, but it is also the language of commerce, engineering and other sciences such as biology, physics and computing.

**The BSc in Mathematics program is a four-year program that includes seven tracks:**

- Applied Mathematics Track
- Computer Science Track
- General Mathematics Track
- Mathematics and Physics Track
- Pure Mathematics Track
- Pure Mathematics (Advanced) Track\*
- Statistics and Financial Mathematics Track

\*The Pure Mathematics (Advanced) Track is specially designed for mathematically gifted students. Students in this track will study a series of mathematics courses at a deeper level, which better prepare the students to pursue postgraduate studies.



## Career Prospects

About a quarter of MATH graduates pursue further studies, with a majority of them enrolled in well-known institutions abroad. Another quarter of MATH graduates choose careers in teaching. The remaining graduates are employed in various business and service sectors, working in areas including but not limited to administration and management, computer programming, data analysis, accounting, insurance, marketing, sales, purchasing, banking and finance, and academia.

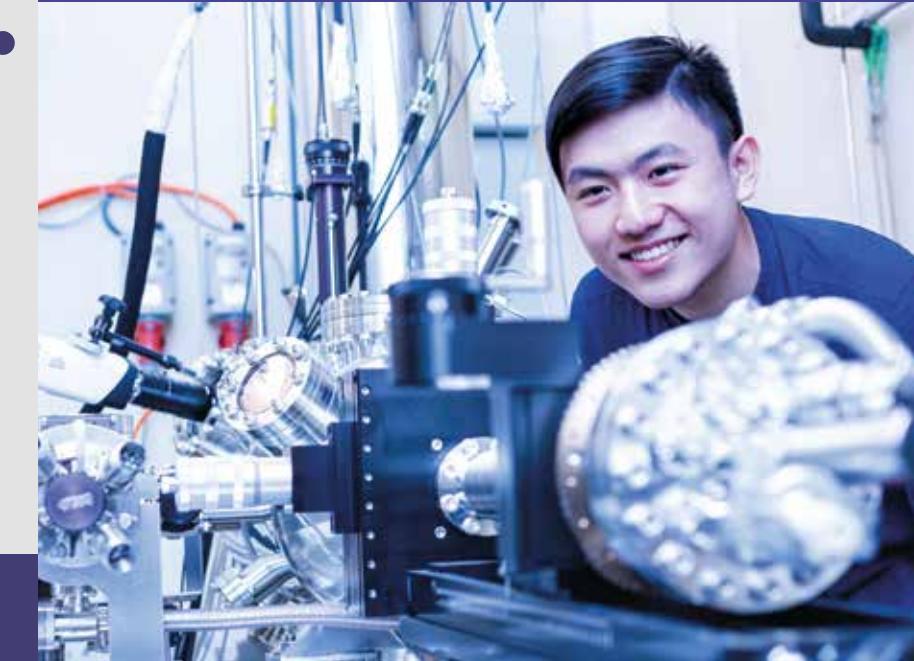
# PHYSICS (PHYS)

## Program Overview

Physics encompasses everything from the tiniest elementary particle to the ultimate fate of the universe, and provides the foundation for all modern science and engineering. The BSc in Physics program provides students both depth and breadth in their study. Students will learn about exciting topics ranging from quantum computing, superconductivity and nanotechnology to quarks and black holes. The program prepares students for science-related careers, or for further studies in physics and related fields.

**The program offers two options:**

- **Honors Physics Option** - This option is intended for students planning to enter graduate school after their undergraduate studies at HKUST. The curriculum provides a strong foundation of courses and requires students to complete a research project and thesis in their final year.
- **Physics and Mathematics Option** - This option is intended for students with a strong interest in both physics and mathematics. It is particularly useful for students who plan to pursue future studies in theoretical physics.



## Career Prospects

Since students are rigorously trained in generic skills of analytical and problem solving skills, they are well prepared to take up jobs with diverse natures in both the government and private sectors. Students can work in the fields of education, research and development, technical sales, forensic science, medical industry, commerce, banking, etc.

# OCEAN SCIENCE AND TECHNOLOGY (OST)



## Program Overview

The Ocean Science and Technology is an integrative program offered by the Department of Ocean Science, which aims to provide students with a comprehensive foundational understanding of the cross-disciplinary ocean science and technology, and to provide first-hand exposure to the latest scientific and technological development related to investigating, conserving and managing ocean resources.

A major emphasis of this curriculum is the provision of practicum experience, experiential learning, study trips and overseas attachment to enhance students' academic, career and personal development. Ultimately, the goal of the program is to equip the students with the skill sets and attributes that are needed to serve the society by becoming educators, ocean scientists and technologists, and other professionals in environment-related sectors, both locally and internationally.



## Career Prospects

Hong Kong is a coastal city with rich and diverse marine resources because of its unique geographical location in the biologically diverse Western Indo-Pacific region. The demand for talents and professionals in the public, NGOs and private sectors is higher than ever due to the need for environmental impact assessment for future coastal infrastructure projects and the burgeoning business of ecotourism. Graduates of Ocean Science and Technology program are competitive in higher studies and job market, while they will be well equipped to work in environmental consultancies, maritime industries, local environmental NGOs, and government agencies.

# CHEMISTRY (CHEM)

## Program Overview

Students will study all aspects of chemistry and related disciplines. General areas covered include analytical chemistry, inorganic chemistry, organic chemistry, and physical chemistry. Specialized areas include

environmental chemistry, medicinal chemistry, biological chemistry, computational and theoretical chemistry, polymer chemistry, and materials chemistry including nanostructures and advanced instrumentation.



## The program offers four options:

- Biomolecular Chemistry Option
- Environmental and Analytical Chemistry Option
- Materials Chemistry Option
- Pure Chemistry Option

This program provides excellent general training in both analytical thinking and problem solving. The curriculum, which includes basic training in analytical, inorganic, organic, and physical chemistry and modern laboratory techniques and skills, has been specifically designed to allow students maximum flexibility in determining the extent of their specialization.



## Career Prospects

Our graduates have gone on to become chemists or technicians in government laboratories or private accredited laboratories, school teachers, environmental consultants, chemical engineers, Chinese medicine researchers, pharmaceutical lab chemists, marketing representatives for lab equipment suppliers and computer companies, scientific patent officers, script writers, reporters for science journals or magazines, as well as postgraduates that pursue higher degrees in both local and overseas universities.

## Biochemistry and Cell Biology (BCB)

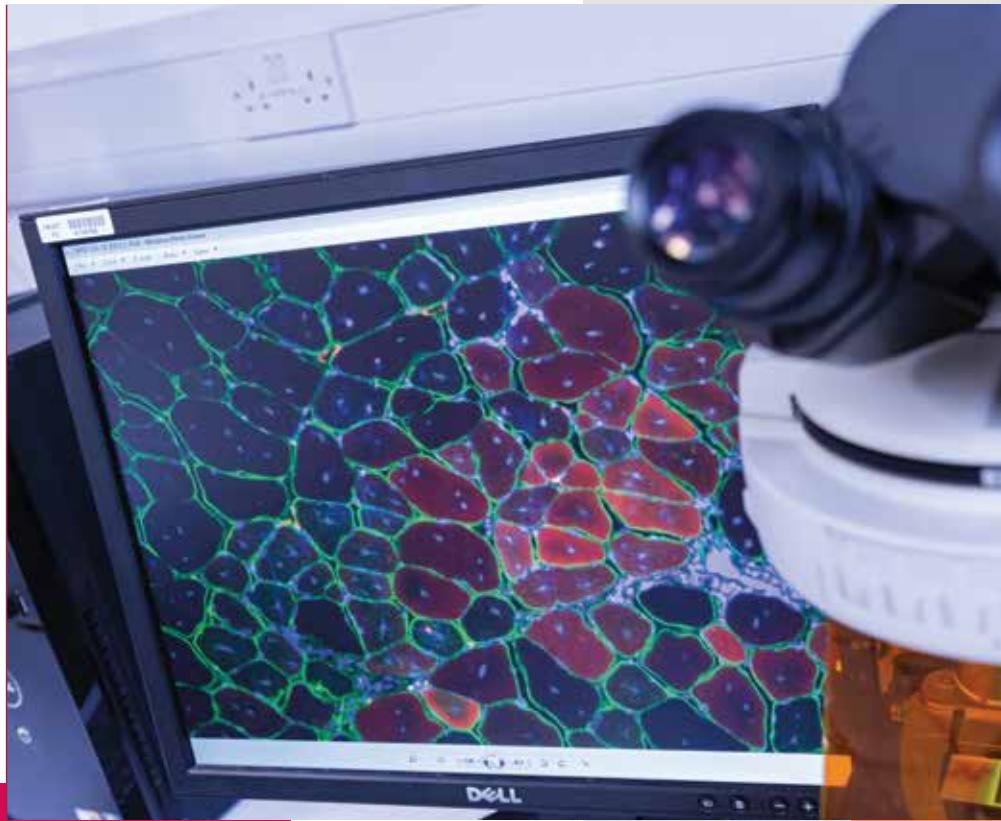
### Program Overview

Students will study how biomolecules, which are the fundamental building blocks of all living organisms, work harmoniously in cell-free experimental systems (Biochemistry) and also within cells (Cell Biology). The early curriculum is broad-based and teaches students the fundamental concepts and principles of Biochemistry and Cell Biology (BCB). This will enable students to explore and develop their own interests in various aspects of modern molecular life science. As they progress through the program, they will take more advanced and specialized elective courses. BCB students will also have the option of engaging in intensive practical training and research opportunities.

The BCB program gives students an opportunity to build a solid foundation in different aspects of modern biochemistry, cell biology, molecular biology and genetics. It also nurtures students who are motivated to pursue postgraduate training and research careers in both academic and industry sectors.

### Career Prospects

BCB graduates will have a broad range of career options. Students will be well-prepared for postgraduate research studies and future employment opportunities in academia, medical and biotechnology research. In addition, BCB graduates will also be fully equipped to pursue other vocational careers in private and government sectors requiring a life science background, including healthcare, biotechnology and education. With recent advances in technology and societal expectations driving an expansion in career and employment opportunities, student will have exceptional prospects to pursue their careers in the field of life science.



## ●●● Biotechnology (BIOT)

### Program Overview

The Biotechnology (BIOT) program focuses on basic and advanced biotechnological elements related to research, development and manufacturing of biotechnology products, including medicines, cosmetics, agricultural goods, food and healthcare devices. The program provides students with theoretical and practical knowledge of the latest biotechnological developments, with particular focus on the applied aspects of life science. The curriculum also requires basic understanding of concepts across various biological spectra including biochemistry, cell biology, molecular biology, microbiology and genetics.

The BIOT program provides students with sound theoretical training in modern life science, and acquaints students with practical skills that are crucial for biotechnology product research, development and production.

### Career Prospects

The Biotechnology major equips students with various basic and specific biotechnological elements to meet the growing demand in the markets of pharmaceuticals, agriculture, business and education. The underlying objective of the major is to serve as a biotechnology powerhouse to provide a fresh supply of capable manpower to propel this emerging industry. Career opportunities are amply available in both the private and government sectors.

## Biological Science (BISC)

### Program Overview

The Biological Science (BISC) program aims to provide students with a broad coverage and a basic understanding of major principles, concepts and technologies of organismal and systems biology, including animal, plant, evolutionary and environmental biology. The flexibility of this major facilitates students in undertaking more elective courses offered by other academic units such as Business, Engineering, and Humanities and Social Science.

The BISC program is to equip students with a broad scope of general biological knowledge, which provides students with comprehensive training in transferable skills as well as opportunities in independent learning required for all career paths.

### Career Prospects

Our Biological Science students are armed with strong skills in acquisition of scientific enquiry and critical thinking and the majority of graduates pursue jobs requiring interdisciplinary knowledge. Moreover, students will be equipped with strong problem solving skills and analytical skills throughout their science training. A wide range of career options will be available to the Biological Science graduates.

## Biotechnology and Business (BIBU) •••

### Program Overview

The Biotechnology and Business Program (BIBU) is jointly offered by the School of Science and the School of Business and Management. It aims to groom students with a hybrid interest in both biotechnology applications and business operations. It offers students a broad-based learning experience that encompasses essential life science and biotechnology knowledge, as well as complementary business know-how, including accounting, finance, economics, marketing, operations management, etc. It also further enhances students' creative and critical thinking abilities while helping them develop a global outlook on biotechnology development and applications, thereby laying a solid foundation of knowledge and skills to develop, manage, and market biotechnology initiatives.



### Career Prospects

The holistic BIBU experience prepares students to excel in any career path they aspire to. This program offers rigorous training in both biotechnology and business, which is designed to prepare students for successful leadership positions within the biotechnology industry. Potential employers include multinational pharmaceutical companies, vendors of biotechnology products/services, consulting firms focusing on the biotechnology and pharmaceutical industries, etc. A wide range of career opportunities are available in both private and public sectors.

## Mathematics and Economics (MAEC)

### Program Overview

The Mathematics and Economics (MAEC) program is jointly offered by the School of Science and the School of Business and Management of HKUST. The program provides students with solid training in the fundamental theories of both mathematics and economics. The curriculum equips students with quantitative reasoning skills, conceptual understanding and the ability to effectively communicate in mathematics and in the language of economics and social sciences.

The complexity and technical aspects of contemporary economic problems exhibit strong synergy between mathematics and economics. The program offers an advantage to students who would otherwise major in mathematics or economics alone. This interdisciplinary degree is suited to students who seek the option of taking a quantitatively oriented job in the finance industry or who intend to pursue postgraduate study in applied mathematics, economics, business or related areas such as operations research or management science.

### Career Prospects

Career opportunities in the banking and finance industry in Hong Kong are promising for those who are capable of applying mathematical tools to understand the financial markets and make economic forecasts. Graduates with an interdisciplinary degree are increasingly valued and needed in the job market, and tend to have more diverse career options than those majoring in Mathematics or Economics alone. A number of MAEC alumni have joined top-ranked financial institutions and multinational firms. Our MAEC graduates are equipped with sufficient background for entry into advanced/professional degree programs in economics, financial mathematics, statistics, and other business-related fields. Recent graduates have been admitted to PhD/Master's programs at leading universities in the world.



# JOINT SCHOOL PROGRAMS

## Data Science and Technology (DSCT)

### Program Overview

The Data Science and Technology (DSCT) program is jointly offered by the School of Science and the School of Engineering. Various business and industry sectors have a huge demand for data specialists/scientists to conduct in-depth analysis of the valuable datasets that they have collected during the business process.

Graduates of data science and technology will be a perfect fit to these emerging job opportunities in the market. The program will equip students with various mathematical tools, data analytical skills and IT technologies to make sense of data obtained from various sources.

DSCT students use a wide spectrum of mathematical and IT tools, and develop basic knowledge of data analysis and programming skills that will allow them to understand and analyze actual phenomena of massive data obtained from rich information sources. Additionally, students will receive hands-on experience and expert guidance to acquire practical skills of data analysis that will provide them a good step to their future. Areas of expertise of this program include machine learning, classification, clustering, data mining, database management, cloud computing, data visualization, etc.

### Career Prospects

A lot of data specialist/scientist positions are created every day in various business and industry sectors to make use of the massive datasets collected there. Graduates of data science and technology are of high demand in today's job market, and most of them will be employed in those sectors such as IT, engineering, and finance. There will be other career opportunities such as management and sales, etc.



## Risk Management and Business Intelligence (RMBI)

### Program Overview

Risk management and business intelligence are vital parts of a company's strategic planning and decision-making in the globalized era. The BSc in Risk Management and Business Intelligence (RMBI) program integrates training in both risk management and business intelligence and addresses their market needs in a single undergraduate program.

Combining the strengths of HKUST's School of Business and Management, School of Engineering, and School of Science, the cutting-edge BSc in RMBI program incorporates a curriculum that caters to market needs with an emphasis on quantitative techniques and business knowledge, encompassing:

- Understanding of risks in financial institutions and other firms, including market risks, credit risks, operational risks, and business risks
- Mathematical models and methods of assessing and minimizing risks
- Data/text mining methods and advanced technologies to analyze and manage the increasingly large volume of business data available for decision-making

### FinTech Option

Students can opt for the FinTech Option to learn about the latest developments in FinTech, which combines the traditions of financial engineering and risk management.



### Career Prospects

RMBI graduates will be well prepared for a wide range of positions related to risk management and business intelligence, such as risk analyst, compliance consultant, data analyst, customer analytics manager and business analyst.

# RESEARCH EXCELLENCE



## Department of Physics

### Research Foci

- Atomic, Molecular, and Optical (AMO) Physics
- Biophysics
- Computational Physics
- First Principles Studies of Material Properties
- Information Physics
- Nano Materials
- Particle Theory and Cosmology
- Physics of Semiconductors
- Soft Condensed Matter Physics
- Strongly Correlated Electron Systems
- Surface Physics
- Ultrafast Photonics and Nonlinear Optics
- Wave Phenomena and Wave Functional Materials

The Department concentrates its resources on condensed matter physics with potential relevance to the technological industry. Faculty research focuses on optical condensed matter and statistical physics, and includes the physics of lasers, solid state, mesoscopic systems, devices nanomaterials, thin films, surfaces, interfaces, liquid crystals, polymers and composites.

The Department also has a close link with HKUST's front-running William Mong Institute of Nano Science and Technology for the interdisciplinary collaboration in the area of nanomaterials and nanotechnology.

## Department of Mathematics

### Research Foci

- Algebra and Number Theory
- Geometry and Topology
- Analysis and Differential Equations
- Applied and Computational Mathematics
- Financial Mathematics
- Probability and Statistics
- Data Science

The Department enjoys a range of up-to-date facilities and equipment for teaching and research purposes. The department's computer laboratory and Math Support Center are equipped with 70 desktop computers for undergraduate and postgraduate students. The Department also provides an electronic homework system and a storage cloud system to enhance teaching and learning.

To assist computations that require a large amount of processing power, a High Performance Computing (HPC) laboratory was setup in 2000. By making use of these powerful computing facilities, our faculty and students are able to solve computationally intensive problems in their innovative research projects so that they can stay at the forefront of their fields.



# RESEARCH EXCELLENCE

## Department of Chemistry

### Research Foci

- Analytical/Environmental Chemistry
- Chemical Biology
- Material Sciences
- Molecular Dynamics and Structure of Complex Systems
- Synthetic Chemistry

The Department is well equipped with modern laboratories and state-of-the-art instrumentation. In addition, the Department has international links with major chemical industries and has played a key role in setting up university-wide collaborations involving universities, research institutions and companies in Hong Kong, the Mainland China, Japan, Europe and the US.

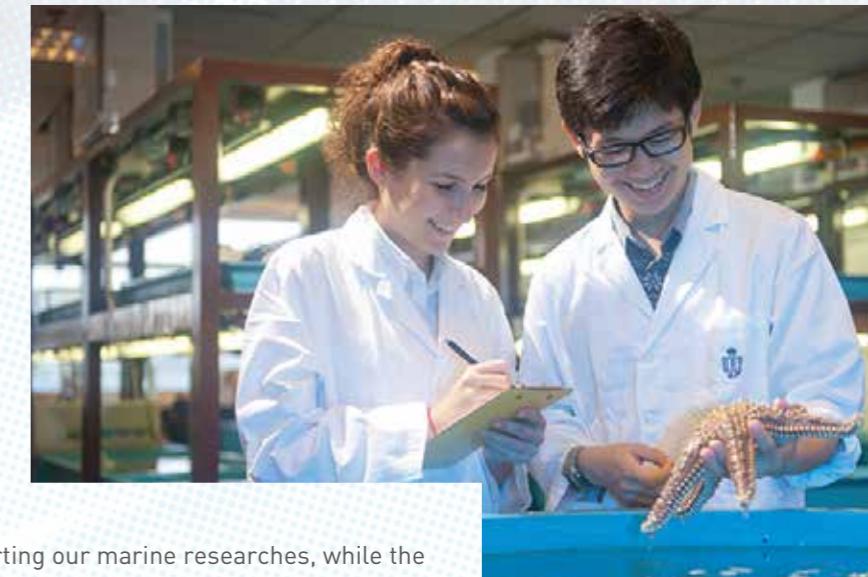


## Department of Ocean Science

### Research Foci

- Marine Ecology
- Oceanography
- Ocean Technology

The Department emphasizes on building multi and cross-disciplinary research and educational programs in Ocean Science and Technology. Our primary study sites include the estuarine environment of the Pearl River, the coastal bays of Hong Kong, and the deep sea (including the South China Sea). Our Ocean Research Facility on campus is a key item of infrastructure supporting our marine researches, while the Environmental Central Facility provides a range of equipment and technology commonly used in water and atmospheric environmental researches.



## Division of Life Science

### Research Foci

- Cellular Regulation and Signaling
- Cancer Biology
- Developmental Biology
- Molecular and Cellular Neuroscience
- Macromolecular Structure and Function
- Biotechnology and Medicinal Biochemistry

The Division has established robust research infrastructure in a broad range of areas. The Animal Care and Plant Care Facility provides a centralized and modern facility for study of animals and plants. Centralized state-of-the-art facilities for biochemical and cellular studies are provided by the Biosciences Central Research Facility. Faculty members working in these areas form a coordinated research team. Such coordination takes full advantage of the faculty's expertise in generating innovative development and productive research.



## Academic Advising

The Office of Academic Advising and Support is established in the School of Science to provide students with general orientation to the university, initial advice on course selection and consultation on the choice of major. The Office provides guidance to students on academic-related issues through –

- Providing accurate and relevant information about academic programs and other educational experiences available to them;
- Providing one-on-one consultation on the choice of major and possible double major / major-minor combinations to suit their interests, abilities and goals;
- Explaining university regulations, graduation requirements, and institutional policies and procedures;
- Enhancing their awareness of available educational resources on campus such as internship, mentorship, undergraduate research and exchange programs;
- Encouraging the use of the institutional and community services in support of academic success.

## MAGNET (Make A Great Net)

MAGNET is a peer mentoring program in the School of Science that aims to help new students make a smooth transition to HKUST by providing a supportive environment in which they will meet a diverse group of students who share similar experiences and interests. Peer mentors are selected senior year students from different science disciplines, who are interested in assisting new students in overcoming the obstacles they may encounter during their first year. The mentor / mentee connection provides an academic, cultural, and social support network for students seeking academic excellence and satisfaction.



## First Year Course – SCIE1000 Science School Induction

SCIE1000 Science School Induction, led by faculty advisors, advising staff and peer mentors, is a one-year course designed to provide support and guidance for all year one science students. It offers activities such as Science Majors Week, Popular Science Talk, etc., to help students adapt to university life, explore different majors and connect with faculty members and other students.



## Student Development Programs – Science for Success

### University Student Sponsorship Programme in Wildlife Conservation

Collaborating with the Ocean Park Conservation Foundation Hong Kong, selected students will be fully sponsored to travel overseas to gain first-hand research experience, while contributing to wildlife conservation.

### MenTernship Program

Students joining the MenTernship Program will be offered opportunities to shadow social dignitaries, through social encounters and internship experience in the mentors' respective fields.

### Overseas Cultural Exploration and Service Trips

To raise students' awareness of serving the community, service learning trips, such as going to Cambodia and Sri Lanka, have been held for students. Students will be involved in various service projects and given opportunities to have cultural exchange with the local people. The trips will also include visiting the heritage sites in the countries.

### Cultural Study Tours to Mainland China

Our School has established close relationships with renowned institutions such as China Pharmaceutical University, Tsinghua University and Sichuan University to organize various study tours, encouraging students to step out of their comfort zone to experience a glimpse of Chinese culture.

### SCI/NUCLEUS Team

SCI/NUCLEUS is a student-driven science busking team established to mobilize Science students, alumni and staff to promote pop science and serve the community together.

### "Knowledge Without Border" Series

To broaden students' horizons beyond their major studies, seminars and workshops on a wide spectrum of topics covering culture, politics, economics, and environment, will be held on a regular basis.

## Internships and Research Opportunities

### Career Training and Internship Opportunities

Students will be provided with an array of career training activities including one-on-one career consultation on exploring their career goals, mock interviews with HR experts from different industries, and firm visits. The School will also provide individualized services such as referral to partner companies to help students find internship experiences and graduate jobs.



### Undergraduate Research Opportunities Program (UROP)

UROP is a HKUST signature program designed to provide undergraduate students with exciting opportunities to engage in academic research. In Fall, Spring and Summer semesters, lists of UROP projects are open for student application. The qualified students work closely with faculty members on the research and scholarly activities, thereby develop insightful perspectives on their areas of interest and advance the frontiers of knowledge. Students are also most welcome to propose a project title to a faculty member if he or she agrees to do the supervision.

Successful completion of UROP courses may lead to stipend as encouragement, or credits to fulfill part of the program requirement. For UROP project papers/posters accepted for presentation at an academic conference, or accepted by international journal, various sponsorships will be conferred to the UROP students. Students who exhibit excellent research performance may also be nominated for award, in recognition of their contribution to research and innovation at HKUST.



## Student Exchanges

Currently, the School has more than 90 exchange partner institutions covering regions including Australia, Europe, North America, Southeast Asia and Mainland China, etc. Students joining the exchange program will be offered opportunities to experience overseas learning and new cultures for an entire semester.

### EUROPE

#### Austria

MCI Management Center Innsbruck

#### Denmark

Technical University of Denmark  
University of Copenhagen

#### France

CY Cergy Paris University  
Ecole Polytechnique  
Universite Grenoble Alpes

#### Germany

RWTH Aachen University  
Technische Universitaet Darmstadt  
Technische Universitaet Muenchen  
University of Stuttgart

#### Ireland

National University of Ireland, Galway  
Trinity College Dublin

#### Luxembourg

University of Luxembourg

#### Netherlands

University of Groningen  
Utrecht University  
Wageningen University

#### Norway

University of Bergen

#### Poland

Jagiellonian University

### OCEANIA

#### Australia

Monash University  
The Australian National University  
The University of New South Wales

#### Switzerland

Ecole Polytechnique Federale de Lausanne  
ETH Zurich  
University of Zurich

#### Turkey

Sabanci University

#### United Kingdom

Cardiff University  
Lancaster University  
Newcastle University  
The University of Manchester  
University of Aberdeen  
University of Birmingham  
University of Bristol  
University of Exeter  
University of Glasgow  
University of Leeds  
University of Southampton  
University of Strathclyde  
University of Sussex



### NORTH & LATIN AMERICA

#### Canada

The University of British Columbia  
University of Manitoba  
University of Toronto  
University of Waterloo

#### Mexico

Tecnologico de Monterrey

#### United States

Columbia University  
Cornell University  
Georgia Institute of Technology  
Indiana University  
Iowa State University  
Lehigh University  
Mills College  
Missouri University of Science and Technology  
Northwestern University  
Rice University  
Rutgers, The State University of New Jersey  
Smith College  
Stony Brook University  
University of California

University of Florida  
University of Massachusetts Amherst  
University of Notre Dame  
University of Virginia  
University of Wisconsin-Madison



### ASIA

#### Japan

Kyoto University  
Osaka University  
Sophia University  
The University of Tokyo  
Tohoku University  
Tokyo Institute of Technology

#### Korea, Republic of

Korea Advanced Institute of Science and Technology  
Korea University  
Pohang University of Science and Technology  
Seoul National University  
Ulsan National Institute of Science and Technology

#### Mainland China

Beihang University  
Beijing Institute of Technology  
Fudan University  
Harbin Institute of Technology  
Nanjing University  
Nankai University  
Peking University  
Shanghai Jiao Tong University  
Shanghai University of Finance and Economics  
Sichuan University  
Tianjin University  
Tsinghua University  
Xi'an Jiaotong University  
Zhejiang University

#### Malaysia

Universiti Putra Malaysia

#### Philippines

Ateneo de Manila University

#### Singapore

Nanyang Technological University  
National University of Singapore

#### Taiwan

National Central University  
National Chengchi University  
National Chiao Tung University  
National Taiwan University  
National Tsing Hua University

## Vibrant Students

Studying Environmental Science (ENVS) at HKUST is like joining a big family to me. The Department provides various opportunities, including laboratory work, internship courses and field trips to ENVS students. These precious practices have geared us up and allow students to be well-prepared to enter the related fields upon graduation.

**Jolie NG**  
BSc in Environmental Science, Class of 2021

The Biochemistry and Cell Biology program fascinates you of how you have been looking at cells and DNA in the past. Professors and lecturers guide you to dig deep into the molecules and develop your curiosity in exploring more about mysterious mechanisms in cells. HKUST provides opportunities from research opportunities to exchanges and internships. I have taken part in an internship in a medical device company which gave me a brief idea of what the healthcare system is like, preparing myself to devote to the medical field after graduation.

**Peony WONG**  
BSc in Biochemistry and Cell Biology, Class 2021

The Department of Mathematics exceeds my expectations by providing the quality education I could not get in Nicaragua. Joining the Chern Class for talented mathematicians provided me the support to go abroad to the University of Waterloo, where I was able to broaden my horizons.

**Mauricio Antonio RODRIGUEZ GUTIERREZ**  
BSc in Mathematics, Class of 2021

My experience at HKUST has been unparalleled. Every day at HKUST is met with exciting new opportunities. Activities ranging from genetic engineering in iGEM to debating in Model United Nations have prepared me for a variety of career paths. Having feet in both the School of Science and the Business School allows you to build relationships with people from all over the world.

**Thomas Michael BIEK**  
BSc in Biotechnology and Business,  
Class of 2021



The IRE track is a well-designed pathway for students who wish to pursue academic research, with support and guidance provided all along the way. Through IRE, I have worked with professors and faculty to pursue my interests in organic synthesis and biomolecular chemistry, while even being accepted to take part in research at a foreign institute in summer. HKUST really fosters a strong sense of curiosity and inquisitiveness within its students - the qualities essential in any aspiring researcher.

**Vignesh Gopalakrishnan UNNITHAN**  
BSc in Chemistry (International Research Enrichment Track), Class of 2020



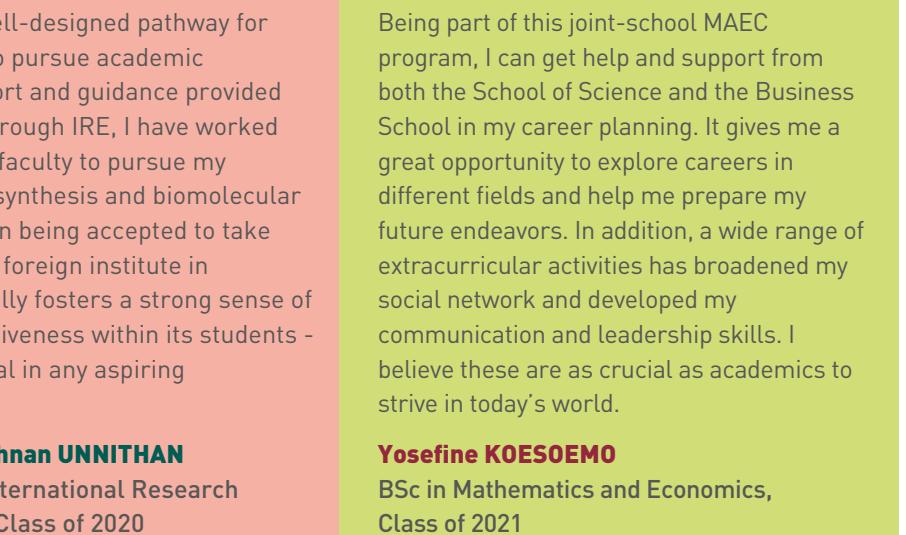
Being part of this joint-school MAEC program, I can get help and support from both the School of Science and the Business School in my career planning. It gives me a great opportunity to explore careers in different fields and help me prepare my future endeavors. In addition, a wide range of extracurricular activities has broadened my social network and developed my communication and leadership skills. I believe these are as crucial as academics to strive in today's world.

**Yosefine KOESOEMO**  
BSc in Mathematics and Economics,  
Class of 2021



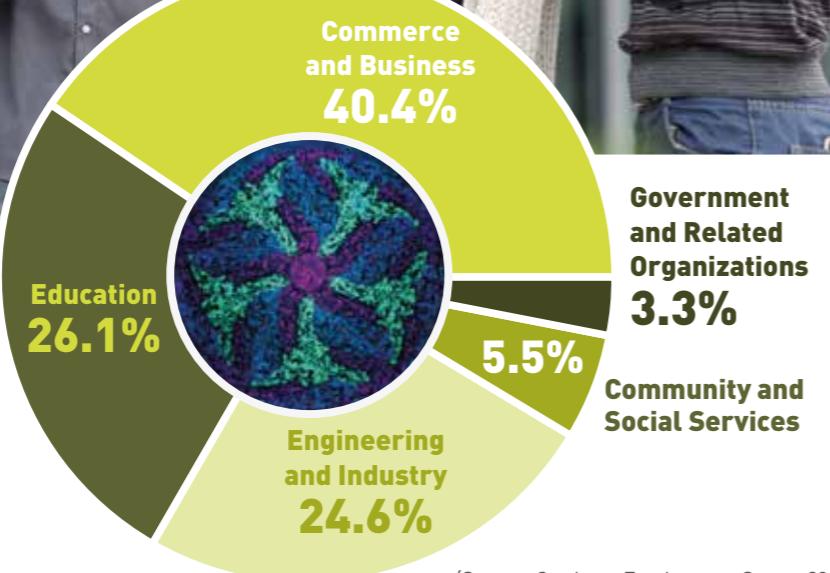
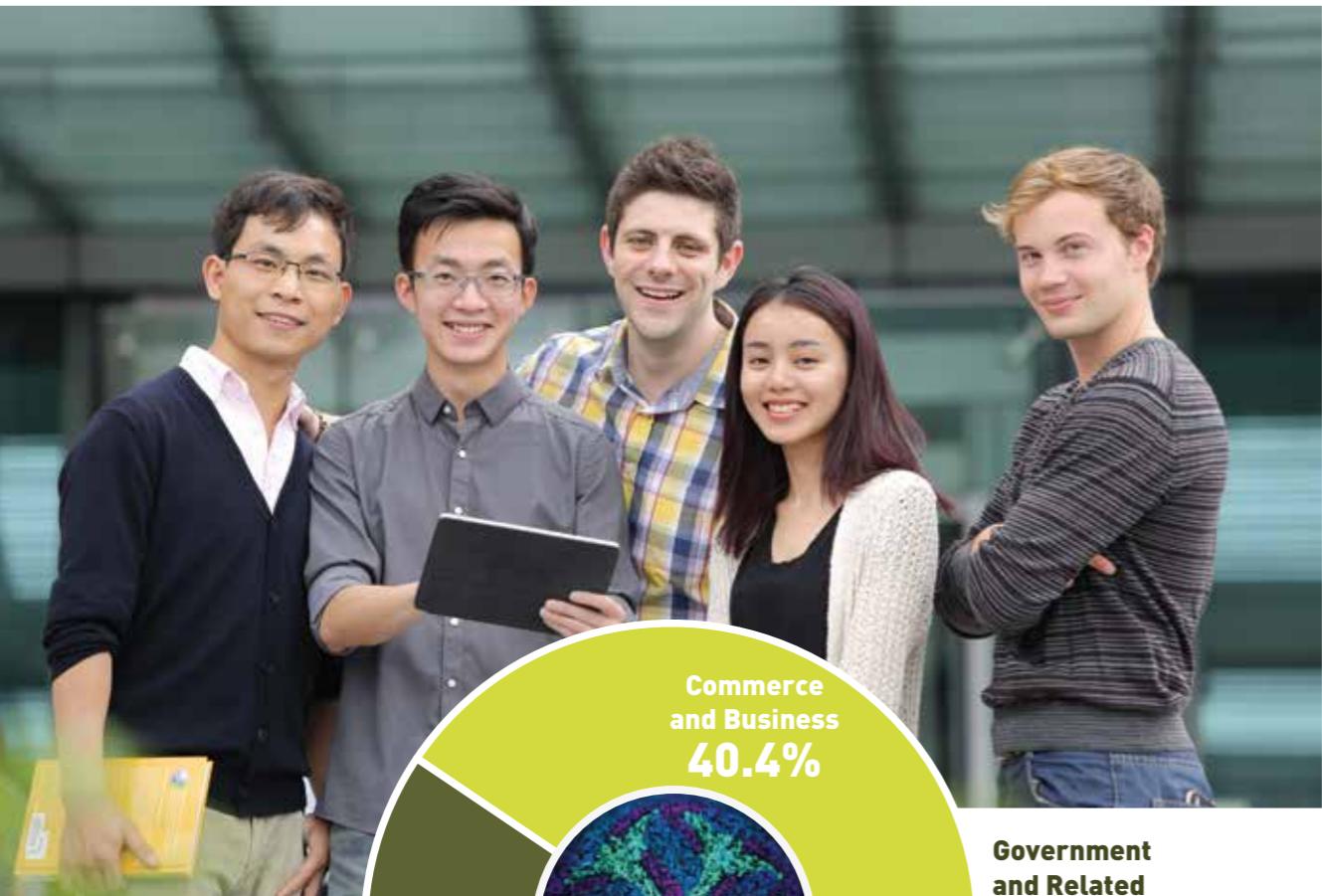
Pursuing a bachelor degree towards data science and technology has been one of the most remarkable experiences in my life. It gives me an opportunity to fulfill my passion of making sense of data. The well-designed curriculum prepares me for internships and conducting research with different professors. However, the whole journey would not be as meaningful without the incredible fellows I have met in the data science family and the much larger School of Science community. As a part of the School, I am fortunate enough to have joined the MenTernship Program and attended a few service trips. Can't wait for future adventures to come!

**Mark Christopher Siy UY**  
BSc in Data Science and Technology,  
Class of 2021



The IRE program serves as a hub for research-minded students in the School of Science, where we are given guidance and resources to explore our interests. IRE students are offered opportunities to examine various topics in real-world research under the direct supervision of professors. Moreover, the school-sponsored overseas summer research internship enabled me to join a research group at the European Organization for Nuclear Research (CERN), which operates one of the largest laboratories on the planet. HKUST has a strong research environment, and the IRE program augments this experience for science students.

**William YAM**  
BSc in Physics (International Research Enrichment Track), with additional major in Mathematics, Class of 2020



Students pursuing further studies are not included in this survey.

Each year, however, about 25% of our science graduates pursue further studies in globally renowned universities, which include:

- California Institute of Technology
- Columbia University
- Cornell University
- ETH Zurich
- Imperial College London
- Johns Hopkins University
- McGill University
- National University of Singapore
- Stanford University
- The University of Edinburgh
- University of California, Berkeley
- University of Cambridge
- University of Chicago
- University of Oxford
- University of Pennsylvania
- University of Toronto

## High-Achieving Alumni

I have always been passionate in looking for creative solutions to solve different problems. Starting my business is like a science experiment - you identify a problem, construct a hypothesis and experiment with different possibilities.

You must have perseverance to strive for the best solution!

### Francis KWOK

Co-Founder & Chief Executive Officer  
Radica Systems Limited  
BSc in Physics

Through undergraduate education at HKUST, I developed a strong science fundamental knowledge especially under the guidance of experienced scholars. The academic program has equipped me with great analytical, organizational and problem solving skills. These skills are still applicable in my current design work as design is also a process to find the most optimal solution for environmental, technological and sociological problems.

### Kinando HEUNG

Senior Landscape Architect (Head of the team)  
BSc in Chemistry

Coming to HKUST was the best choice I have ever made. I always felt encouraged to step out my comfort zone and dare to try the impossible – this is how I became the first science student to graduate with double majors in Biochemistry and Cell Biology and Computer Science. My experiences in laboratories and interdisciplinary courses, as well as the exchange in Cornell University broadened my horizons, trained my logical thinking, and prepared me for a PhD study at Johns Hopkins School of Medicine – something I would have never imagined without HKUST.

### Qingyang WANG

BSc in Biochemistry and Cell Biology (International Research Enrichment Track), with additional major in Computer Science, Class of 2018  
PhD student at Johns Hopkins School of Medicine

It is very fruitful! I have taken advantage of the many research opportunities offered by the International Research Enrichment (IRE) Program. In the first two years, I was in Prof. Lortz's research group doing experimental research on high-temperature superconductors. I continued my interest in this subject after I went for exchange at Columbia University and worked with a renowned theorist Prof. Andrew Millis on the novel superconductivity of FeSe. After returning to HKUST, I got a chance to join Prof. Vic Law's research group and started to train myself to be a condensed matter theorist and get to know the field of topological superconductors. The IRE program has given me plenty of training to be a serious researcher and opportunities to interact with brilliant scholars.

### TAM Pok Man, Harry

BSc in Physics (International Research Enrichment Track), Class of 2018  
PhD student at University of Pennsylvania

At my time when considering tertiary education in Hong Kong, HKUST was renowned as an atypical university with high quality in homework and examination which might alter the choice of an A-level graduate. On the contrary, the experience I have gained with stressed and packed timetable, together with recurrent mid-term and final examination do give me a sense of connection to a competitive business world. HKUST is willing to invest and attract distinctive lecturers and professors. I still miss the chance with honor to attend lectures by a world famous biologist. Together with the communion atmosphere with multicultural community and the beautiful landscape, I will recommend HKUST as a suitable choice to you!

### Ronan Chan

Country Manager – Hong Kong and Taiwan,  
Cardiac Rhythm Management,  
Abbott Medical (Hong Kong) Limited  
BSc in Biology

# ADMISSIONS

## Admission Routes

Our undergraduate students are drawn from a wide range of academic, cultural and social backgrounds. Our applicants can be classified into the following categories:

- **Joint University Programmes Admissions System (JUPAS) applicants:** Local applicants applying via JUPAS on the basis of Hong Kong Diploma of Secondary Education (HKDSE) results;
- **Local Direct Entry applicants:** Local non-JUPAS applicants applying on the basis of non-HKDSE qualifications;
- **International applicants;**
- **Mainland China, Taiwan and Macau (MTM) applicants**

The above applicants follow either one of the following admission routes:

- JUPAS Admissions (JUPAS applicants should submit application to JUPAS)
- Direct Admissions (All non-JUPAS applicants should submit application directly to HKUST via the Online Application System for Undergraduate Programs)

For details, please visit <https://join.ust.hk>

## Admission Requirements (Direct Admission)

HKUST School of Science considers the following in making admission decisions:

- Public examination results and academic performance
- Personal statement
- Non-academic achievements
- Referees' reports
- Interview performance (if applicable)

### Applicants with International Qualifications (e.g. IB, GCEAL, SAT/AP, etc.):

In addition to fulfilling the University's general requirements, applicants applying for:

- **Science (Group A)** program must have at least one senior level subject from Mathematics / Physics
- **Science (Group B)** program must have at least one senior level subject from Biology / Chemistry
- **IRE** program must have at least one senior level subject from Biology / Chemistry / Mathematics / Physics

### Applicants with Joint Entrance Examination for Universities in PRC (JEE, PRC) Qualifications:

- 1) Science stream, or;
- 2) For candidates from provinces that do not distinguish between Arts and Science streams are required to take at least one of the following subjects:
  - for Science (Group A) program: Physics
  - for Science (Group B) program: Chemistry, Life Science / Biology

### Applicants with Post-Secondary Qualifications:

Applicants must fulfill either one of the following requirements:

- 1) Completion of an associate degree in a post-secondary institution recognized by HKUST
- 2) Completion of a higher diploma program in a post-secondary institution recognized by HKUST
- 3) Transfer students from local or overseas degree programs: GPA B+ or GPA 80% is normally expected

Eligible post-secondary qualification holders are welcome to apply to the following programs:

- BSc in Biochemistry and Cell Biology (BCB)
- BSc in Biological Science (BISC)
- BSc in Biotechnology (BIOT)
- BSc in Chemistry (CHEM)
- BSc in Mathematics (MATH)
- BSc in Ocean Science and Technology (OST)
- BSc in Physics (PHYS)



# ADMISSIONS

## Admission Requirements (JUPAS Admission)

### Minimum Entrance Requirements for Science Programs

Applicants must achieve the following minimum grades in four core subjects and two electives:

Program	JUPAS Code	English	Chinese	Mathematics	Liberal Studies	Elective 1	Elective 2 M1 / M2 can be accepted in place of an elective
International Research Enrichment (IRE)	JS5101	3	3	2	2	3	3
Science (Group A)	JS5102	3	3	2	2	3	3
Science (Group B)	JS5103	3	3	2	2	3	3

### JUPAS Score Calculation

#### Science (Group A) Program (JS5102) and Science (Group B) Program (JS5103):

The weighted scores of the following 5 subjects are summated to form the admission score:

Subject	Weighting	
	Science (Group A) Program	Science (Group B) Program
English Language	x1.5	
Mathematics (Compulsory Part)	x1	
Best science elective*	• Physics or M1 or M2 (x2)	• Biology or Chemistry (x2)
Must be one of M1 / M2 / Biology / Chemistry / Physics / Combined Science	• Biology or Chemistry or Combined Science (x1.5)	• Physics or M1 or M2 or Combined Science (x1.5)
Best two other subjects*		
Can be core subject, M1 / M2 or any Category A subject		

\*Note: The highest scores of at most TWO weighted science electives will be taken in the admission score calculation.

#### International Research Enrichment Program (JS5101):

The unweighted scores of the following 5 subjects are summated to form the admission score:

Subject	Weighting
English Language	x1
Mathematics (Compulsory Part)	x1
Best two science electives: Must be from: Biology, Chemistry, Physics, M1 / M2 or Combined Science	x1
Next best subject: Can be core subject, M1 / M2 or any Category A subject	x1

Note: Interview is a must for admission to IRE program. Applicants should put IRE program among the Band A choices to get interview opportunity.

JUPAS Score Calculator: <https://join.ust.hk/admission/jupas>



### Scholarships

The University and the School of Science offer a number of scholarships to award the top students from all backgrounds, based on academic merits and non-academic achievements upon entry and during the course of study. For details, please refer to <https://sfao.ust.hk/>



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