香港中文大學
The Chinese University of Hong Kong

FACULTY OF ENGINEERING

Engineering Today for Tomorrow

2022-23

CUHK

Founded in 1963, The Chinese University of Hong Kong (CUHK) is a leading comprehensive research university committed to research and education excellence with a global reputation. Located in the heart of Asia, CUHK has a vision and a mission to combine tradition with modernity, and to bring together China and the West. Under the University's unique college system, the programmes and activities offered by its nine colleges complement the formal curricula by delivering whole-person education and pastoral care. The University has eight faculties: Arts, Business Administration, Education, Engineering, Law, Medicine, Science, and Social Science. Together with the Graduate School, the University offers over 300 undergraduate and postgraduate programmes. All faculties are actively engaged in research in a wide range of disciplines, with an array of research institutes and research centres specialising in interdisciplinary research of the highest quality.

The University houses five state key laboratories which are entrusted by the Ministry of Science and Technology of China to produce research of international quality and carry out important national research tasks. The University also has an excellent record of published research, both in discipline-specific journals and in more high-profile publications such as *Science, Nature,* and *The Lancet.*

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Dean's Words

Engineering: Shaping the future, Creating endless possibilities

Founded in 1991 by our former Vice-Chancellor the late Prof. Charles Kao, also known as the 'Father of Fiber Optics' and Nobel Laureate in Physics, the Faculty of Engineering comprises world-leading experts who are at the forefront of their disciplines and commit to teaching and research excellence.

The Faculty provides innovative education to our engineering students. Currently with more than 3,000 undergraduate and graduate students, we offer a wide spectrum of academic programmes in Artificial Intelligence: Systems and Technologies, Biomedical Engineering, Computer Science and Computer Engineering, Electronic Engineering, Energy and Environmental Engineering, Financial Technology, Information Engineering, Mathematics and Information Engineering, Mechanical and Automation Engineering, and Systems Engineering and Engineering Management. To enrich students' learning experiences, we provide a variety of ways to engage students in learning such as hands-on experiences, exposure to engineering entrepreneurship, field trips, international exchange, undergraduate summer research internship and placement.

The Faculty has been well-recognized internationally for its excellence in engineering research. Our world-class laboratories and facilities enable excellent research to be carried out. We have been working closely with government and industry for developing new technologies to meet the societal needs and improve the quality of mankind. About 30 years ago, CUHK was the pioneer in Hong Kong's internet infrastructure and development. The fact that majority of today's internet traffic in Hong Kong still routes through CUHK's communication equipment is a testimony and legacy of our pioneering and continuing contributions to Hong Kong. Today, Artificial Intelligence (AI) is poised to transform every aspect of our lives. The immense success of the startup SenseTime, the first Unicorn in HK, highlights our leading position in the area of AI. On international rankings in Engineering, we are among the best in the world. Reuters named CUHK as the most innovative university in Hong Kong in recent years.

The industrial revolution and the information age have changed the course of history. Engineers shoulder growing responsibilities for the betterment of mankind. We are now in the midst of the 'Fourth Industrial Revolution', fusing the physical, digital and biological worlds. The convergence of the Internet of Things, Artificial Intelligence, Robotics, Data Science, Biotechnology, Materials Engineering, Microelectronics, Autonomous Vehicles, Advanced Manufacturing, and Nanotechnology are poised to disrupt every industry and every aspect of modern life. CUHK Engineering must work together with other Faculties to play a key role in shaping the Fourth Industrial Revolution. In the years ahead, we will continue to strengthen our teaching and research excellence, as well as responding to the grand challenges facing the world.

In this brochure, you will find information about our Faculty's figures, professors' and students' achievements, undergraduate programmes and students' sharings. On top of that, you are more than welcome to talk to our people or visit the facilities when you have the chance.

Prof. Martin D.F. WONG
Dean of Engineering

Faculty of Engineering

Faculty Mission

The Faculty is committed to the education of future leaders in engineering, the pursuit of knowledge at the frontier of modern technology, and the application of technology to meet societal and human needs. In both teaching and research, the Faculty is guided by the highest international academic standards.

There are six departments in the Faculty of Engineering:

- Biomedical Engineering
- Computer Science and Engineering
- Electronic Engineering
- Information Engineering
- Mechanical and Automation Engineering
- Systems Engineering and Engineering Management

Degree Programmes

The Faculty currently offers the following bachelor, master, and doctoral degree programmes:

Bachelor of Engineering

Artificial Intelligence: Systems and Technologies
Biomedical Engineering
Computer Engineering
Electronic Engineering
Energy and Environmental Engineering
Financial Technology
Information Engineering
Mechanical and Automation Engineering
Systems Engineering and Engineering Management

Bachelor of Science

Computational Data Science
Computer Science
Learning Design and Technology
Mathematics and Information Engineering

Double Degree Option

Engineering and Business Administration*

Postgraduate Diploma

Financial Technology

Master of Science

Biomedical Engineering
Computer Science
E-Commerce and Logistics Technologies
Electronic Engineering
Financial Technology
Information Engineering
Mechanical and Automation Engineering
Systems Engineering and Engineering Management

Master of Philosophy & Doctor of Philosophy

Biomedical Engineering
Computer Science and Engineering
Electronic Engineering
Information Engineering
Mechanical and Automation Engineering
Systems Engineering and Engineering Management

* The Engineering and Business Administration Double Degree Option is jointly offered by the Faculty of Engineering and Faculty of Business Administration. Please refer to P.40 for programme details.

Facts and Figures

Students #

2,349	Undergraduate	603	Master of Science (Taught Postgraduate)
39	Master of Philosophy	753	Doctor of Philosophy

Academic Staff *	121 Professoriate	32 Non-Professoriate	273 Research Support
Non-academic Staff *	64 Administrative Support	48 Technical	

#As of 30 June 2022 *As of 31 August 2022

Excellence in Teaching and Research

Over a hundred of the Faculty professorial staff possesses extensive teaching and research experience. Not only do they educate youngsters with passion, but they also develop forefront technologies that benefit the society. The great range of research areas includes mechanics, electronics, information processing, internet, digital entertainment, etc. Some of the research involves multi-disciplinary knowledge such as biomedical, energy, logistics and financial engineering. Our professors have extensively published their research findings in world-class journals and conferences, and at the same time applied their R&D results into practical usage. Their efforts were well recognized by the public, and many of them were awarded different international prizes and honours.

Father of Fibre Optics

The former Vice-Chancellor the late Prof. Charles KAO founded the Department of Electronic Engineering in 1970. He innovated the groundbreaking optical fibre communication that changed the world, and built a long-term research strategy focusing on information and communications technologies at CUHK.

THE COVID-19 has affected many patients to have proper rehabilitation with regular training. Telerehabilitation becomes a solution. Prof. Raymond Kai-Yu TONG and his team have developed an innovative AR-Home & AR-Centre Rehab platform which utilises state of-the-art depth sensors for 3D body tracking, with customised software specially designed for a virtual interactive rehabilitation environment. The research team invited more than 16 professional physiotherapists and occupational therapists from seven local rehabilitation centres to design 46 training exercises. The team overcame technological challenges by providing a platform for therapists to monitor users' body movements and provide real-time posture guidance, with a secure tele-rehabilitation connection with data encryption. At home, the system can be set up easily with only a computer, a depth sensor, an internet connection and a TV/monitor.

UGC Teaching Award

Professor Anthony Man-cho SO was awarded the 2022 UGC Teaching Award (General Faculty Members) by the University Grants Committee, in recognition of his achievements in learner-centred teaching and leadership in multidisciplinary curriculum and programme design.

Prof. Wei-Hsin LIAO's research team has developed an embedded energy harvester which is very efficient in generating electricity to sustainably power the smart watches and wristbands. Prof. Liao was selected to receive the Adaptive Structures and Material Systems Award by ASME for his contributions to the sciences and technologies associated with adaptive structures and material systems and was the first Hong Kong recipient of this award.

"Save mum's voice" -- a meaningful application AI based text-to-speech

Prof. LEE Tan's team helped an oral cancer patient who lost her natural voice after surgery to "speak" again in her own voice. This was done using a tailored text-to-speech system based on deep learning models. The patient can communicate with others by typing words or sentences in the App and the App will generate speech in the patient's own voice.

Prof. Jonathan Chung Hang CHOI and his team have developed a new gold nanoparticle as a self-therapeutic treatment for psoriasis. Devoid of steroids or biologics, this gold nanoparticle can downregulate the genes that are linked to epidermis hyperproliferation and inflammation and is an effective treatment for psoriasis.

A multidisciplinary research team from CUHK Engineering and CUHK Medicine has developed an AI system for the automated, rapid and accurate detection of COVID-19 infections in chest CT images. The system is validated on multiple, unseen, independent external cohorts from mainland China and Europe, showing the potential and feasibility to build large-scale medical datasets with privacy protection, so as to rapidly develop reliable AI models amidst a global disease outbreak such as the COVID-19 pandemic.

Prof. Raymond YEUNG has been awarded the position of RGC Senior Research Fellow 2022/23 (Research and Development of Network Coding Technologies) with the support of over HKD 7 million from the Research Grants Council (RGC) in sponsorship of the prestigious fellowship. The award represents a great honour in recognition of Prof. Yeung's work in network coding.

Prof. Raymond Kai-Yu TONG, inventor of the 'Hand of Hope' robotic exoskeleton hand for stroke rehabilitation, has been honoured with the 'Global Ageing Influencers 2021' award at the ninth Asia Pacific Eldercare Innovation Awards Ceremony, held by Ageing Asia in Singapore. The award was granted in recognition of his outstanding achievements in rehabilitation innovations. Prof. Tong is the only winner of the 'Global Ageing Influencers 2021' from Hong Kong. On the same occasion, the 'HOPE 4 Care' programme, led by Prof. Tong's biomedical engineering research team and the CUHK Faculty of Medicine, was also awarded 'Best Rehabilitation Programme'. The team focused on combining software and robotic technologies with clinical expertise to enhance rehabilitation outcomes for stroke patients.

XPLORER PRIZE 2021

Prof. Yi-Chun LU was selected as one of the awardees of the XPLORER PRIZE 2021. As one of the three scholars from Hong Kong awarded the Prize, Prof. Lu is recognised for her outstanding achievements in the field of energy and environmental protection.

Prof. Lu's team has successfully invented a safe, high-energy, low-cost, and environmentally-friendly battery that serves as a substitute for commercial lithium-ion batteries which are indispensable in daily lives. Her research has provided a new platform for designing an aqueous electrolyte with a large voltage window and high stability for energy storage.

Established by Tencent Foundation, the XPLORER PRIZE is a merit-based public interest award, developed and evaluated by prominent scientists. Focusing on basic sciences and frontier technologies, the XPLORER PRIZE is awarded to up to 50 young scientists every year.

CUHK InnoHK Centres

InnoHK is a major initiative of the Hong Kong Special Administrative Region Government to develop Hong Kong as the hub for global research collaboration. This involves the establishment of world-class research clusters at the Hong Kong Science Park with research laboratories set up by world-renowned universities and research institutes to conduct collaborative researches. In a major contribution to Hong Kong's innovation agenda, the Faculty of Engineering has launched three research centres under AIR@InnoHK, one of InnoHK's two research clusters focusing on AI and robotics technologies.

Centre for Perceptual and Interactive Intelligence
Hong Kong Centre for Logistics Robotics
Multi-Scale Medical Robotics Centre

The Geneva International Exhibition of Inventions 2022

Prof. Shih-Chi CHEN won Gold Medal for his research project, 'ultrafast oscillating blade microtome' at the Geneva International Exhibition of Inventions 2022.

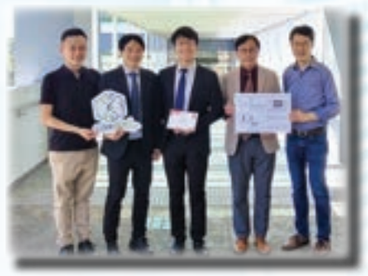
This new oscillating blade microtome enables the precise sectioning of various ultrasoft tissues, fresh tissues and fixed whole organs that were hard to process before. The sectioning of soft tissues is achieved by exploiting the viscoelastic effect, i.e., the tissue self-stiffens at high frequency. This invention can help solve key challenges in novel bio-imaging applications, creating huge market value for the pathology and biophotonics industries.

Student Achievements

The Faculty has been nurturing countless engineering professionals with excellent academic performance since its inception in 1991. Apart from academic knowledge acquisition, they have active participation in many local and international activities, and a number of them have also represented Hong Kong to participate in overseas contests and returned with great success.

A Year-3 undergraduate student, Miss SIU Man Hei Connie, from the Department of Biomedical Engineering, has been awarded the Innovation and Technology Scholarship Award. The Innovation and Technology Scholarship Award is established with joint sponsorship and support from the Innovation and Technology Commission and The Hongkong and Shanghai Banking Corporation Limited (HSBC), which is organised by The Hong Kong Federation of Youth Groups (HKFYG). The Award provides a scholarship and a series of elite training opportunities to widen students' international exposure, gain industry experience, and nurture students' passion for and commitment to science and technology. Connie is one of the total of 25 awardees in Hong Kong.

The CUHK team, comprising four undergraduates Miss WANG Xingyu, Miss KWOK Tien Wing, Mr. WANG Wenhao and Mr. CHEN Yiwei from the Department of Mechanical and Automation Engineering, received the Silver Award in the Intelligent Logistics Handling of the "Smart +" Category in the national finals of the 2021 China University Students Engineering Practice and Innovation Ability Competition.



Mr. TSANG Chung Yin Justin, a final-year undergraduate student from the Department of Biomedical Engineering, has won a Gold Award from the ASM Technology competition 2022. The ASM Technology Award promotes technological innovation in Hong Kong and recognises students for their accomplishments in technology. The winning project demonstrates a colloidal biocatalyst, copper-doped Zeolitic Imidazolate Framework 8 (ZIF-8), that can convert blood borne s-nitrosothiols into nitric oxide, which can be used as a targeted and sustained colloidal drug carrier for acidic atherosclerotic plaques.

The CUHK team '404NoBrain' won the PwC Hackaday 2021. This is the third time our students won this event since its inauguration in 2017 - Champion for 2017, 2018 and 2021. The winning team is composed of two Computer Science and Engineering and two Information Engineering students.

Champion (Tertiary Division) in the "My Green Space" Student Competition 2020-21

Mr. HO Ka Chun from the Energy and Environmental Engineering programme and his team member were awarded Champion (Tertiary Division) in the "My Green Space" Student Competition 2020-21 organised by the Hong Kong Green Building Council.

The theme of the competition was 'The Wellbeing of Us – Build a better place for People and Environment'. The team selected Gloucester Road Garden and O'Brien Road Footbridge as the design concepts in their winning project 'The Green Wai Chai'.

Mr. CHOI Ho Yin Issac, a Year-4 Undergraduate student from the Department of Systems Engineering and Engineering Management, led a team of 4 won the 1st Runner-up in the Citibank Disruptive Client Experience in the Digital Banking Era organized by HKGCC Business Case Competition with a monetary prize of $20,000. The team strives to enhance the user journey by revamping Citibank HK mobile app, introducing Calendar Banking, integrating with mobile OS ecosystems, and redefining Relationship Management with the use of data and algorithms.

The Engineering robotics team of the Faculty of Engineering received the Grand Prix Award at the Asia-Pacific Broadcasting Union's Asia-Pacific Robot Contest (ABU Robocon 2022). It was the second time CUHK took the award. The Engineering robotics team was selected to represent Hong Kong in the ABU Robocon after winning the championship at the Robocon 2022 Hong Kong Contest. Since ABU Robocon's inception in 2002, CUHK robotics team has advanced to five finals (2016, 2019, 2020, 2021 and 2022) of this international trophy, and in 2019 it was the first Hong Kong team to win the championship.

Mr. WANG Yan, Mr. LIN Hongbin, and Mr. WANG Xuchen, PhD students from the Department of Mechanical and Automation Engineering, supervised by Professor AU Kwok Wai Samuel performed outstandingly to win the Top Prize for the first time at the 17th 'Challenge Cup' National College Students' Extracurricular Academic Science and Technology Contest (Challenge Cup), with a miniaturised steerable surgical drill for bone work in a confined space. Organised biennially by multiple national ministries, including the committee of the Communist Youth League of China, China Association for Science and Technology, and Ministry of Education, the Challenge Cup is famed as the Olympics of promoting science, technology and innovation among university students in Mainland.

Diverse Learning Experiences

Engineering Leadership, Innovation, Technology and Entrepreneurship Stream (ELITE Stream)

The ELITE Stream is offered by the Faculty to students with excellent academic performance. It aims to nurture outstanding engineering students and to develop their potentials through additional challenging courseworks and invaluable extra-curricular activities. The award of the ELITE Stream to qualified students will be officially recorded on academic transcript together with a certificate. A series of stimulating and inspiring courses will be offered exclusively for ELITE students. There are exclusive scholarships, special exchange opportunities, social and scholarly events specially organized for ELITE students.

Details of the entrance, coursework requirements and declaration procedures for the Stream can be viewed at: www.erg.cuhk.edu.hk/elite

European Innovation Academy

ELITE students were nominated to participate in European Innovation Academy in Europe, a three-week programme where participants from various universities around the world worked in multidisciplinary teams to start up new IT innovations, mentored and educated by industry leaders and professors.

KEI Yat Long
Financial Technology under ELITE Stream

Hong Kong is an international financial centre. Bringing the latest technology to the financial service industry is one of my biggest interests. Therefore, I am grateful to enter the CUHK Fintech programme, which lets us explore a wide range of knowledge, such as investment science, Fintech regulation policy, and machine learning. Besides the theoretical knowledge learned in lectures, I also obtained hands-on technical experience in project-based courses. Moreover, the fruitful experience of participating in the ELITE stream let us explore more in the research field with the additional challenging coursework. Through various extra-curricular activities, not only can we build connections with people in different areas but also sharpen our leadership and teamwork skills.

WOO Pui Yung Anna
Mathematics and Information Engineering under ELITE Stream

The programme equipped me not only with solid engineering knowledge but also with problem-solving skills and abilities to generate innovative solutions. The ELITE stream also played an important role in my education. The ELITE courses were challenging and stimulating; e.g., some required me to learn a topic of my choice and give a presentation on it. Furthermore, I met many brilliant ELITE classmates. We exchanged ideas and also taught and motivated each other. Besides, I was provided with various experimental learning opportunities, e.g., research internships and a summit. I am super grateful to the programme and the faculty for their support and education.

Undergraduate Summer Research Internship

The Faculty has launched the Undergraduate Summer Research Internship programme to support its students to undertake research projects under supervision of professors in summer. This programme gives students exposure to research environment, and grooms them for graduate studies.

International Exchange

The University has student exchange programmes with world-renowned 280 partner institutions in more than 35 countries/ regions covering Asia, Australia, Europe, and the Americas. To broaden students' international exposure, the Faculty also offers numerous overseas summer study programmes and internship opportunities.

Professor Charles K. Kao Research Exchange Scholarship

To pay tribute to the late Prof. Charles K. Kao for his achievements in science and technologies and to commemorate his being awarded the Nobel Prize in Physics 2009, the University has set up the Charles K. Kao Scholarship Endowment Fund to support outstanding students of Engineering and Physics to go on research exchange at prestigious institutions overseas.

Prof. Sir Charles K. Kao and Lady Kao met the scholars at the inaugural ceremony of the CUHK Professor Charles K. Kao Scholars Association.

LIN Yi Ting
Biomedical Engineering
Recipient of Charles K. Kao Research Exchange Scholarship

I completed an eight-week internship at the Lightwave and Microwave Photonics Laboratory at the University of Georgia at Athens. This internship inspired me a lot both academically and culturally. My first impression of this lab was its stellar teamwork among the students who excelled at multiple disciplines, which made the research discussions fruitful and rewarding. I always enjoyed not only listening to other people's stories and original ideas, but also learning from their attitudes. Through these interactions, we learned new and different engineering techniques from each other. Working in a lab with students from diverse cultural and academic backgrounds was an enriching experience for me. After this internship, I am more passionate about research.

GLOBEX Summer Programme@PKU

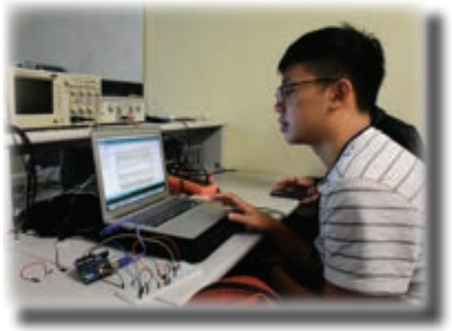
The programme collaborated with Peking University (PKU) supports engineering students to study both engineering and cultural courses in the College of Engineering, PKU.

LEONG Samantha Antonio
Biomedical Engineering graduate

It was in class that I met amazing and brilliant minds. There were students who were not afraid to speak up, challenge new ideas and question unclear concepts. There were students who could combine knowledge from other GLOBEX courses and use it in their own design in presentations. There were friends I made that were brilliant not only in engineering, but also in other fields that I share an interest in. This month-long exchange was a never-ending stream of constant self-improvement. Needless to say, this exchange is very beneficial.

General Education

General Education plays a vital role in the University's mission to provide a balanced undergraduate education for all students. It equips students with the intellectual capacity for understanding critical issues, ideas, and values of humanity and of modern society. The University offers a wide range of general education courses that nurtures students to be educated persons capable of making informed judgment, serving the community and taking up the challenges of this ever-changing world.



Double Majors and Minor Programmes

Engineering students can flexibly pursue second major or minor programmes according to their orientation and interest in other disciplines such as Business Administration, Economics, Journalism and Music, etc. Students developing multiple talents in combination of the Engineering major and minor programmes, would certainly gain advantages after graduation.

Placement and Internship Progamme

To assist students in fostering their future career development, the Faculty has initiated the Placement and Internship Progamme (PIP) for decades. Many students take the option of a one-year industrial full-time placement before they continue their final year of study. They will be engaged in a supervised training in an organization normally for a period of twelve months, during which they will be exposed to real working environment and will take part in projects working together with experienced engineering professionals. The comprehensive and intensive training provides students with valuable working experience.

The Faculty also collaborates with companies to hold recruitment talks, technology seminars and workshops periodically such that students can keep abreast of the industrial trends.

List of selected companies participating in the PIP

- Asia Satellite Telecommunications Co. Limited
- ASM Pacific Technology Limited
- CLP Holdings Limited
- Fujitsu PC Asia Pacific Limited
- Google
- Hewlett Packard HK SAR Limited
- Hong Kong CSL Limited
- Hong Kong Deposit Protection Board
- Hong Kong Monetary Authority
- Hong Kong Science and Technology Parks Corporation
- IBM
- ITE Smartcard Solutions Limited
- LinkPOWER Technology Co. Limited
- Microsoft
- Chief Information Office, Office of the HKSAR Government
- OKIA Optical Co. Limited
- Securities and Futures Commission
- Smartone Telecommunications Holdings Limited
- Sun Hung Kai Real Estate Agency Limited
- The Hong Kong Jockey Club
- The Hong Kong and Shanghai Banking Corporation
- The Hong Kong Mortgage Corporation Limited
- Thomson Reuters Hong Kong Limited
- Tencent
- VTech Telecommunications Limited

For more information, please visit the website of Faculty of Engineering: https://pip.erg.cuhk.edu.hk

Undergraduate Programmes

Starting from the 2022 entry, the Faculty of Engineering has adopted programme-based or department-based admission, which enables our undergraduate students to enjoy greater flexibility in planning their study pathways. Prospective students can apply for any of the following undergraduate programmes through the JUPAS and non-JUPAS admission routes.

- Artificial Intelligence: Systems and Technologies (JS4468)
- Biomedical Engineering (JS4460)
- Computer Science and Engineering (JS4412)
- Electronic Engineering (JS4434)
- Energy and Environmental Engineering (JS4462)
- Financial Technology (JS4428)
- Information Engineering (JS4446)
- Mechanical & Automation Engineering (JS4408)
- Systems Engineering & Engineering Management (JS4458)

Three Interdisciplinary Programmes

- Computational Data Science (JS4416)
- Learning Design and Technology (JS4386)
- Mathematics and Information Engineering (JS4733)

"Predicting the future isn't magic, it's artificial intelligence." – Dave Waters

ARTIFICIAL INTELLIGENCE: SYSTEMS AND TECHNOLOGIES

Programme Features

Artificial Intelligence (AI) is an emerging engineering discipline that focuses on technological innovations in enabling computing systems to behave and discover new knowledge with human-like intelligence. It is a broad area that covers many specializations, such as machine learning, deep learning, knowledge representation/inference, large scale computing systems and distributed systems, logic/constraint programming, human-computer interactions, natural language processing, big data analytics, etc. It has evolved multiple disciplines, such as finance, medicine, manufacturing, robotics, multimedia, telecommunications, computational linguistics, etc. Yet there are still critical challenges on how to innovate and design solid and rigorous solutions for AI, as well as how to properly address the ethical and societal issues this technology incurs.

The AIST programme aims to equip students with the skills needed to design and implement AI systems and technologies that can analyse, reason, and infer knowledge from big data, supported by a rigorous foundation of mathematics, basic sciences, data structures, statistics, algorithms, distributed computing, etc. These skills enable students to develop cutting-edge AI solutions that are of practical use to academia, industry and society.

The AIST programme emphasizes fundamental mathematics, sciences and theories; and complements this knowledge with practical systems skill sets. Four optional specialized streams are offered for students to choose from, according to their personal interests:

- Biomedical Intelligence
- Intelligent Multimedia Processing
- Large-scale Artificial Intelligence – Theory and Systems
- Intelligent Manufacturing and Robotics

Career Prospects

The AIST programme is designed to meet the tremendous current demand for well-trained talents in AI and related specializations. There is now a shortage of AI specialists in both local and global employment markets. According to the Innovation and Technology Bureau, the HKSAR government's policies for innovation and technology – such as re-industrialization, the expansion of the Science Park in Tseung Kwan O Industrial Estate, and the establishment of HK-Shenzhen Innovation and Technology Park in Lok Ma Chau Loop – are expected to create 50,000 jobs for people with knowledge and skills in high-end technologies. Equally, AI specialists are top among the 15 emerging jobs in the USA, with an annual growth of 74% in demand, according to a 2020 LinkedIn Emerging Jobs Report. For these reasons, CUHK aims to train talented AI engineers and scientists across the following industries: biomedical engineering and science; information and computing technologies; manufacturing and robotics; and intelligent multimedia processing for various internet companies.

Rank	Emerging Jobs	Annual Growth in Demand
1	Artificial Intelligence Specialist	74%
2	Robotics Engineer	40%
3	Data Scientist	37%
4	Full Stack Engineer	35%
5	Customer Success Specialist	34%

Source: LinkedIn Emerging Jobs Report (2020).

AU YONG Chun Sang Marco
BEng (Artificial Intelligence: Systems and Technologies) student

For the past years, though I only spent one term physically on campus, my learning experience has been eye-opening. The special thing about the AIST programme is that it is an 'engineering degree' programme, so you get to build a solid foundation that encompasses not only the development of a problem-solving mindset, but also covers fundamental knowledge such as calculus and statistics. Although some may find these topics challenging, they are valuable tools that will help distinguish you from non-engineering counterparts. Other than the faculty package, general education in the CUHK has also broadened my horizons, enabling a multi-disciplinary academic experience, which has pivotal, since the application of Artificial Intelligence is also multi-faceted. With the campus opening soon, surely you will enjoy this programme even more than I did. I hope to see you on campus sometime!

Biomedical engineering is an interdisciplinary field in which engineering and technology are innovatively applied to solve biological and medical problems for the benefit of mankind. The Biomedical Engineering programme is offered by the Faculty of Engineering in extensive collaboration with Faculty of Medicine. Students not only benefit from an education conducted at the forefront of the engineering and medical fields through the programme's core courses, but also enjoy the flexibility to choose from a wide variety of electives that allow them to focus on areas critical to their chosen careers.

The field is responsible for the development of medical engineering technology such as MRIs, brain-computer interface cardiac pacemakers, orthopaedic implants, rehabilitative devices, medical robotics, minimally invasive endoscopes, etc. Biomedical devices are being developed at the micro- and nano-scale to enable diagnosis and therapeutics at the molecular and cellular levels. Students can take advantage of the breadth of cutting-edge biomedical engineering research available on campus through collaborative research in the Faculties of Engineering and Medicine.

BIOMEDICAL ENGINEERING

Technology and innovation are transforming our health. Biomedical Engineers are enabling the transformation.

Programme Features

The programme's specialty areas are:

- Medical Instrumentation and Biosensors
- Biomedical Imaging, Informatics and Modelling
- Molecular, Cell and Tissue Engineering

Career Prospects

BME graduates work in hospitals, universities, government departments, and other public organizations as well as industries. The careers available to programme graduates cover the entire value chain of BME, namely research and development, manufacturing, quality assurance, consultancy, distribution and sale, clinical engineering, regulatory affairs and entrepreneurship in technology. Graduates are also well equipped to pursue advanced study in engineering and biomedical sciences. Some graduates also pursue careers in business, law and medicine.

LAU Fong Yung Yolanda
2021 BEng (Biomedical Engineering) graduate
Medicine Degree, University of Nottingham

I've always been passionate about biomedicine and seeing a surgical robot in an operating theatre prompted my curiosity into the use of biomedical technologies, which is how my journey in engineering began.

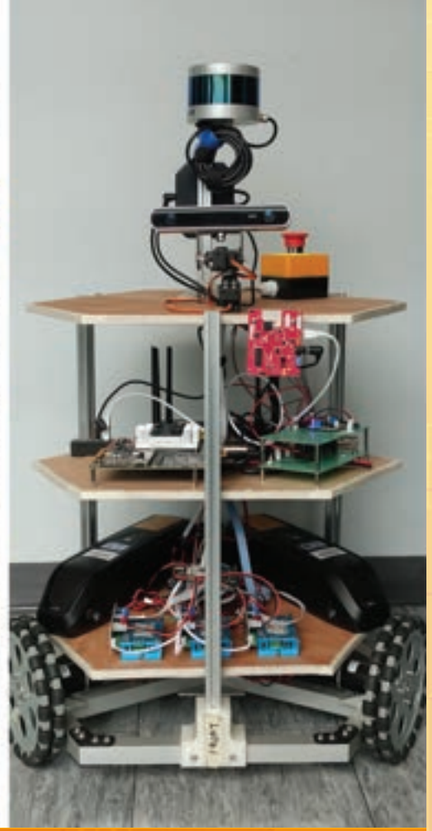
What inspires me most about engineering is its high applicability in other disciplines and the way it intersects with other fields. This is especially true for biomedical engineering, and CUHK provides dynamic opportunities to explore sub-specialities like biomechanics, nanomedicine, tissue engineering etc. We get a lot of hands-on exposure on top of lectures, for example, through laboratory work and hospital training, where I especially enjoyed learning from biomedical engineers at work in a hospital setting.

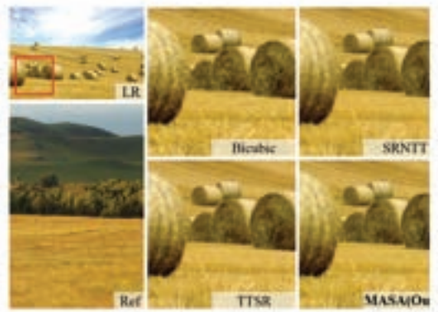
To me, being a good engineer means being creative and flexible in the face of challenges, because solving problems is our most important role. The CUHK BME programme has equipped us with a broad knowledge base spanning topics including anatomy and physiology, biochemistry, physics and maths, as well as programming and laboratory skills. I also had the opportunity to undertake a summer research project on nanomedicine in my freshmen year. Having these tools and experiences helps us translate technology into real-world solutions.

I'm not alone in having multiple passions across disciplines, and we shouldn't have to narrow ourselves down to one specific field. Meeting like-minded individuals at CUHK has been really refreshing. To this day, the people I've met and experiences I've had still inspire my work. I am excited to use all the tools at my disposal to tackle the upcoming problems I'm passionate about.

Tel: (852) 3943 1935 I Email: bmeinfo@cuhk.edu.hk I www.bme.cuhk.edu.hk








COMPUTER SCIENCE AND ENGINEERING

From 2022-23, students can be directly admitted to the Department of Computer Science and Engineering (CSE) through "department-based" admission. Upon completing the first year of study, CSE students will be invited to declare their major in Computer Engineering (CENG) or Computer Science (CSCI). Students with outstanding HKDSE results and good academic performance in their first year of study are guaranteed of their first choice of major.

"Those who can imagine anything, can create the impossible." – Alan Turing

The Computer Engineering (CENG) Programme

The CENG programme was formally established when the Faculty of Engineering was inaugurated in 1991, with an emphasis on both computer hardware and software. Our CENG programme distinguishes itself from others by offering specialized training for students in computer design, mobile embedded systems, microprocessors, and very large-scale integrated circuit (VLSI) design. The CENG curriculum consists of courses in many areas:

- Application: mobile embedded devices, computer graphics, multimedia processing;
- Computer hardware: circuitry theory, logic system design, computer architecture and interfacing, computer arithmetic;
- Computer software: programming, data structure, operating systems, algorithm, software engineering;
- Very large-scale integrated circuit (VLSI) design: Computer-aided design and applications;
- System connectivity: Computer network; etc.

For more details, please visit
https://www.cse.cuhk.edu.hk/admission/cengn/

The Computer Science (CSCI) Programme

The CSCI programme is the first computer science programme in Hong Kong, launched for more than 40 years. It is accredited by the Hong Kong Institution of Engineers IHKIE) and has gained an international reputation for excellent research and teaching. Overall, the CSCI programme focuses more on software innovation and aims to train students with a flexible curriculum that covers diverse and specialized areas such as artificial intelligence, big data analytics, bioinformatics, computer and network security, computer systems and networking, computer-aided design, databases, digital hardware technologies, information systems, internet, multimedia technology, programming languages, software engineering, and theoretical computer science.

For more details, please visit
https://www.cse.cuhk.edu.hk/admission/cscin/

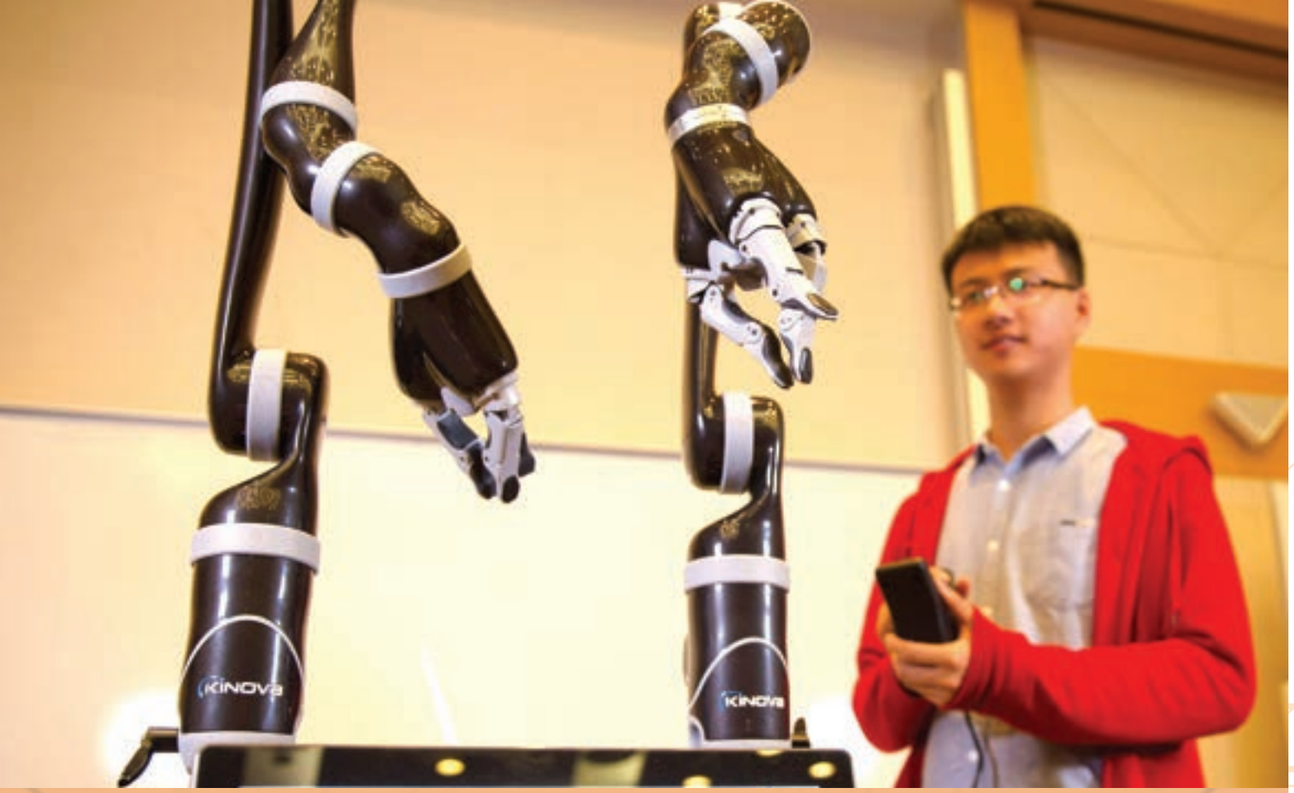
Career Prospects

Over the years, the Department of Computer Science and Engineering has built up a large alumni network in the computer industry of Hong Kong. Many of our graduates have taken up important positions in various organizations and companies, such as the HKSAR Government, The Hongkong and Shanghai Banking Corporation Limited (HSBC), Apple, Deloitte, Facebook, Google, IBM, Intel, Microsoft, Yahoo, and various investment banking institutes. Through this network, our graduates can enjoy a comparative advantage in professional career development. Apart from choosing to work in the industry, some graduates have chosen to further their studies in our postgraduate programme or programmes in internationally renowned universities overseas.

CHAO Yu
2020 BSc (Computer Science) graduate
Software Engineer, Google

Most tech companies nowadays look for candidates with good algorithmic problem-solving skills, so I regard "Data Structures" (CSCI 2100) and "Design and Analysis of Algorithms" (CSCI 3160) as the two most essential courses in CS. Though the courses were very challenging and time-consuming, it made me comfortable in translating algorithmic ideas into actual working programmes. CSCI 3160 laid down the theoretical foundations and made me excel in analyzing the time and space complexities.

"Operating Systems" (CSCI 3150), "Database" (CSCI 3170), "Programming Languages" (CSCI 3180) and "Computer Networks" (CSCI 4430) are equally important; they came up a lot during knowledge-based interviews. I'm now working in Google's Android Pixel team, topics from these courses still often pop up during my day-to-day job. The courses offered by the CSE department give a solid foundation on both the practical and theoretical sides of CS. As the software industry becomes increasingly competitive, I feel quite lucky that I've undergone such rigorous academic training.



ELECTRONIC ENGINEERING

The Department of Electronic Engineering was established in 1970 by the late Professor Charles Kao, former vice-chancellor of CUHK and a 2009 Nobel Laureate, who pioneered the use of optical fibres in communications. Our mission is to educate students to enhance their potential to become global leaders in electronic engineering and instil in them the desire to pursue knowledge and take electronic engineering into the future. This includes hardware, software, and design aspects of electronics as the core, ranging from materials, devices and circuits to systems and their applications for the betterment of humanity. The department's Bachelor of Engineering (BEng) honours degree is accredited by The Hong Kong Institution of Engineers (HKIE).

Programme Features

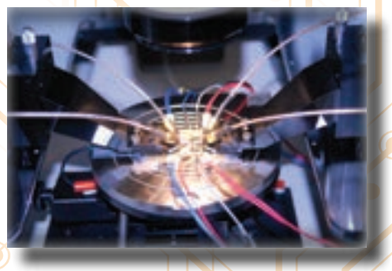
The Electronic Engineering (EE) department's programme provides a broad and foundational engineering training for modern society and generates rewarding career opportunities. The courses EE offers are designed to develop both theoretical and practical knowledge and to provide balanced training in both hardware and software skills. The major topics of study include:

- Integrated circuits
- Wireless and microwave engineering
- Digital signal processing and communications
- Multimedia technology and machine learning
- Semiconductor devices and nanotechnology
- Photonics and optoelectronics
- Robotics, perception, and artificial intelligence

The Electronic Engineering department's work-study scheme allows students to spend one year working full-time in selected electronics or IT companies. Under the personal tutor scheme, professors meet regularly with students to provide advice on their academic and personal development. Thanks to the generous support and patronage of professional societies, local industry and distinguished alumni, the department is able to offer a large number of scholarships to our undergraduates.

Career Prospects

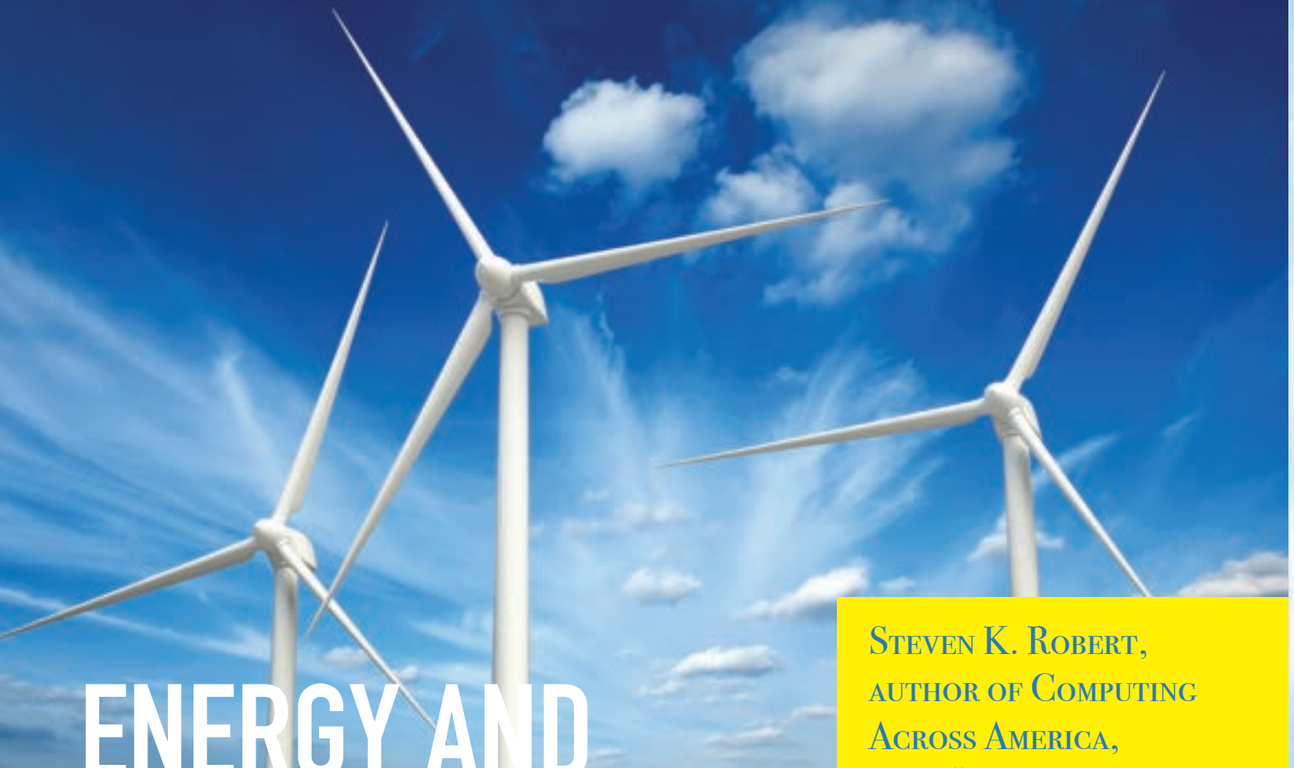
Programme graduates pursue successful careers in a wide range of high-tech industries and business sectors, including telecommunications, computer hardware, information technology, e-commerce, technology services, industrial manufacturing, and product design and development. Some of the graduates also choose to pursue postgraduate studies in local or overseas institutions.



CHAN Joi Hei Joshua
2017 BEng (Electronic Engineering) graduate
Graduate Engineer, MTR Corporation Limited

After my graduation from CUHK EE, I embarked on the graduate development programme in MTR. As a graduate engineer, I was privileged to be given ample opportunities to develop managerial skills and technical knowledge during the two-year cross-functional rotation, ranging from maintenance strategies for rolling stocks and infrastructure to the stringent design criteria for different engineering systems. The all-round training I received at CUHK EE helps me pick up new knowledge in the workplace more quickly and thoroughly, allowing me to embrace cutting-edge technologies and proactively propose value-added solutions to deliver a safe, reliable, and efficient railway service to Hong Kong's commuters.

I used to think that engineering was simply a career. But it turns out it's a profoundly meaningful job, allowing me to help shaping a better society and a better world.



ENERGY AND ENVIRONMENTAL ENGINEERING

Steven K. Robert, author of Computing Across America, said, "Art without engineering is dreaming. Engineering without art is calculating." At EEEN, we do both art and engineering.

The Energy and Environmental Engineering Programme at CUHK provides students with the engineering knowledge and training needed to tackle a broad spectrum of energy issues pertaining to sustainable, environmental and building technologies. The programme provides a strong platform and broad-based perspective for learning and understanding the relations and trade-offs between energy and environment, and the ensuing engineering challenges in attaining viable solutions.

Programme Features

Interdisciplinary by design, the programme strongly leverages the relevant expertise and capabilities offered by CUHK as a comprehensive university. In addition to a fundamental education in energy principles, technologies and systems, the programme features a number of required and core elective courses co-designed with the Earth and Environmental Sciences Programme and the School of Architecture, and a host of elective courses from other Programmes including the Department of Geography and Resource Management, for a broader and more in-depth grounding in the environmental impact of pollution in urban settings. Students are able to pursue any one of the three streams of study according to their personal and career interests: the Sustainable Energy Technology stream for enhanced coverage of renewable energy generation, system design, storage, distribution and management; the Green Building Technology stream for fundamental knowledge of environmental performance assessment and energy management of urban buildings; and the Environmental Engineering stream for principles of natural and built environments, and air pollution monitoring and control challenges.

The programme also includes courses in technical communications, engineering ethics, design application and final year projects to enhance students' training as aspiring professionals. Students are able to participate in and benefit from the many campus and community projects and research topics offered by the university-based institutes as well as units on environmental studies and sustainable development. They also enjoy ample opportunities for summer internships, work-study programmes and international exchanges.

Career Prospects

The knowledge and skills gained by students of the programme afford them strong career prospects. Students are employable in current and emerging areas of energy systems, environmental monitoring and control, sensor instrumentation, and smart and green building technologies, among other areas. They land jobs in government, electric companies and power grid enterprises, building and construction industries, consulting firms and green groups, renewable technology companies and vehicle industries, to cite just some of the possibilities. They also pursue postgraduate studies in their specialized areas of interest in Hong Kong or overseas.

HO Ka Chun Gordon
2022 BEng (Energy and Environmental Engineering) graduate
Graduate Trainee, CLP Holdings Limited

Climate change and the energy crisis are the most pressing concerns of our times, but the ongoing development of new technologies gives us hope to combat them. Combining different facets of the energy and environmental industry, the EEEN programme offers a professional pathway to the sustainability field. I decided to study EEEN because of the tremendous opportunities and market needs for talents in the field. With cross-multidisciplinary courses, internships, competitions, and career-sharing sessions, I have gained not only textbook knowledge but also in-depth industry insights. The hands-on experiences in architecture, mechanical, and electronic design have equipped me to contribute to energy transition in Hong Kong after joining CLP Holdings Limited as a Graduate Trainee.

YEUNG Sze Hang Candy
2022 BEng (Energy and Environmental Engineering) graduate
Graduate Trainee, ATAL Building Services Engineering Limited

EEEN is a holistic programme that covers not only textbook theory but also physical industry training. It gives us autonomy and support in academics, allowing us to progress our careers and pursue our dreams. EEEN provides diverse and in-depth course options for students to explore different fields both within and outside of the engineering industry and equips us to become professional consultants and engineers. I would like to thank my professors and all the amazing people that I have met at EEEN. The opportunities I had here have prepared me to become a Graduate Trainee at ATAL Building Services Engineering Limited. In the future, I hope to continue to make substantial contributions by applying what I have learned at EEEN to make our community a better place.

FINANCIAL TECHNOLOGY

Financial Technology (FinTech) is an emerging engineering discipline that focuses on applying technological innovations to financial practices. Leveraging cutting-edge developments in engineering – in particular information technology and data sciences – FinTech represents an unprecedented opportunity to revolutionize the nature of traditional financial service industry at all levels. Examples of FinTech developments include virtual banks, crowdfunding, digital currencies, and robo-advisory services – with many more applications constantly developing.

> "The major winners will be financial services companies that embrace technology." – Alexander Peh, PayPal and Braintree.

Programme Features

The purpose of the FinTech programme is to educate and equip students with the essential knowledge and capabilities they need to apply technological innovations to financial services, and to nurture leadership and entrepreneurship for the next generation of financial talents in support of Hong Kong's endeavour to grow into an international FinTech hub.

This programme is built upon a strong collaboration between the Faculty of Engineering and the Faculties of Business Administration, Law, and Social Science. It offers multi-disciplinary training to equip students with both a solid technological education in engineering innovations and a comprehensive understanding of the business and legal environment for FinTech. New course offerings, including Financial Infrastructures, E-Payment Systems and Cryptocurrency Technologies, Internet Finance, and Financial Informatics, bring state-of-the-art developments in the field to our undergraduate education programme for the first time. Closely collaborating with the Hong Kong Monetary Authority (HKMA) and Hong Kong Applied Science and Technology Research Institute (ASTRI), the programme also organises internships and overseas exchange to encourage students to apply theory to real-world cases. In addition, the programme offers a double major programme in FinTech-IBBA with the Faculty of Business, as well as a dual degree programme in Financial Math and FinTech with Peking University.

Career Prospects

Programme graduates will be ideally suited for positions that require strong quantitative and technological skills in the financial service industry. Prospective career opportunities include investment and commercial banking, insurance, asset management, internet finance, government regulatory agencies, FinTech startups, and so on. Graduates can also pursue further advanced studies in finance, management sciences and engineering, computer sciences, and related fields. Recent internship placements include DBS, Haitong Securities, Hang Seng, HSBC, HKMA, and Zhong An Insurance.

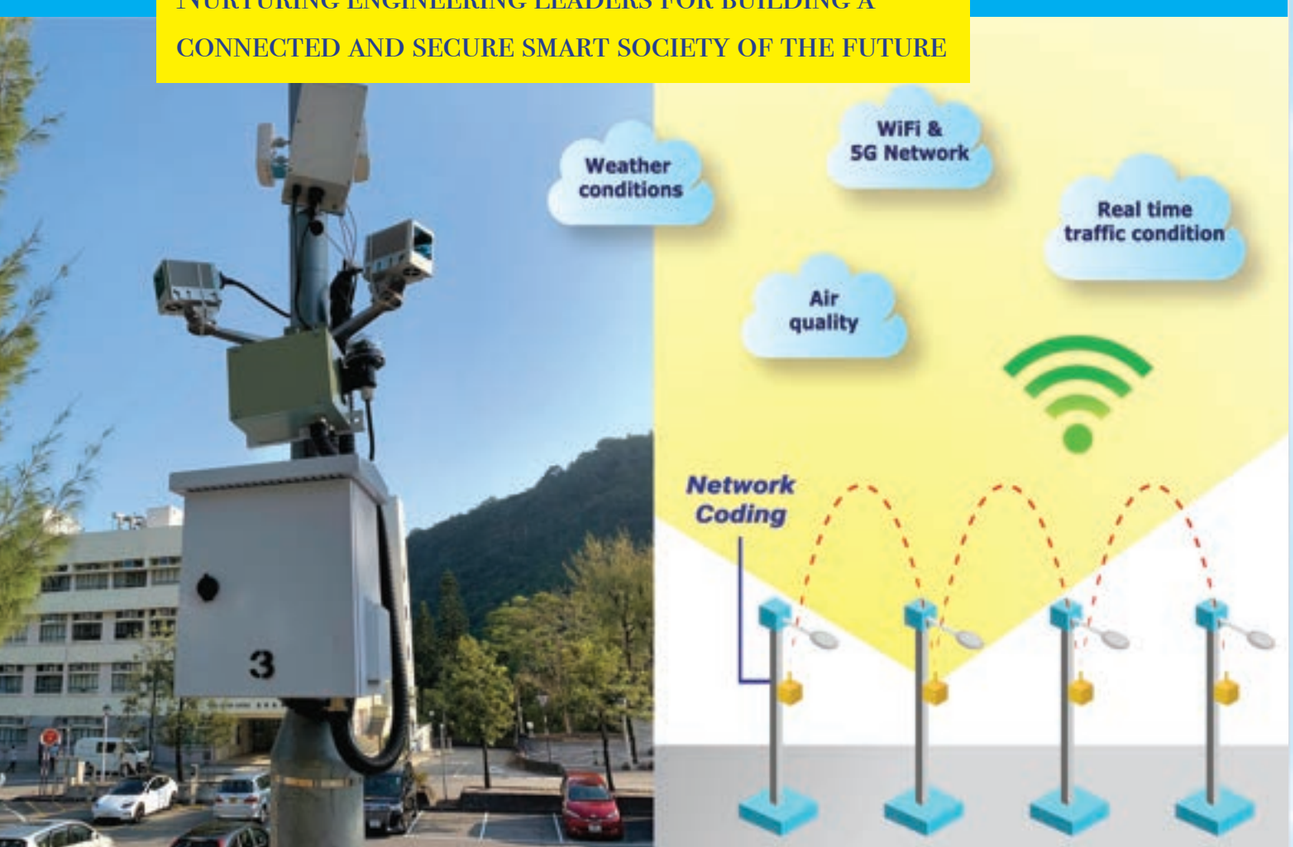
CHEN Yu
2021 BEng (Financial Technology) graduate
Global Markets Engineering Analyst
Goldman Sachs

I chose FinTech as my major because it allowed me to take courses from two different disciplines. During my four years on the FinTech programme, I acquired a wide range of knowledge, from pricing techniques for financial derivatives to cyber security. These courses have deepened my understanding of how to deploy technological solutions in the finance world. The programme also offers fantastic internship and research opportunities, where we were able to apply what we had learned to real-life scenarios. Equipped with finance knowledge and coding capability, my classmates and I became thinkers, developers, and creators. We can predict the pain points in business and utilize software engineering to develop solutions to these problems.

INFORMATION ENGINEERING

The study of Information Engineering (IE) encompasses elements of Computer Science, Electronic Engineering, Data Science, Information Security, Information Theory, Telecommunication Networking, and Artificial Intelligence, and their integration. The gained knowledge and skills will find wide applications in emerging areas such as Artificial Intelligence of Things, Big Data Analytics, B5G/6G, Cloud/Edge Computing, Computer Vision, Cryptocurrency, Industry 4.0, the Metaverse, Smart Cities, and more. The multi-disciplinary nature of our programme is what makes it unique, challenging, and rewarding. Our IE department, established in 1989 as the first IE department and remaining one of a kind in Hong Kong, is devoted to nurturing and educating engineering leaders for the information world of today and tomorrow. Our professors are dedicated educators and world-class researchers. Many of them had extensive experience with leading research institutions worldwide before joining the department. We have a strong presence in the top-tier venues of the global scientific community, as well as strong connections within the local IT industry in Hong Kong.

NURTURING ENGINEERING LEADERS FOR BUILDING A CONNECTED AND SECURE SMART SOCIETY OF THE FUTURE



Programme Features

Information engineering involves the generation, distribution, networking, processing, analysis, and application of information in engineering systems. Key areas of study include:

- Big data and multimedia: multimedia coding, image and video processing, web-scale information analytics, programming big data systems, data science, reinforcement learning, machine learning, social media analytics, Internet of things algorithms
- Cyber security: applied cryptography, system security, cloud computing security, digital forensics, secure software engineering, web programming and security, blockchains, E-payment systems and cryptocurrency technologies
- Internet and applications: internet protocols and systems, building scalable internet services, Internet of things systems, mobile networking, network software design and programming, mobile/web application development
- Telecommunications: optical networks, wireless communications, analogue and digital circuits, embedded systems, switching systems, teletraffic theory, network coding, information theory, stochastic processes

Students have great flexibility to pursue their own interests and may choose to specialize in one or two of the five streams of specialisation – big data, communications, cyber security, internet engineering, and information science.

The programme is accredited by the Hong Kong Institution of Engineers (HKIE).

Career Prospects

IE graduates are equipped with solid engineering knowledge and analytical problem-solving skills to create innovative solutions for practical problems. Our graduates have embarked on successful careers in companies including Morgan Stanley, PwC, Société Générale, HSBC, SmarTone, IBM, MTR, Google, and more, or have started their own businesses, overseas or locally. Each year, around 10% of our graduates go on to further study, undertaking masters or doctorate degrees both overseas and locally. Their destinations include top universities such as CMU, MIT, Stanford, UC Berkeley, Caltech, Cambridge, Georgia Tech and more.

CHAN Sum Yuet
2022 BEng (Information Engineering) graduate
Graduate Programmer, Origo

As a student interested in cybersecurity, IERG courses offer me hands-on experience of the concepts taught in lectures. The IERG programme also allows flexibility in major electives. I was able to take related courses such as the 'Operating Systems' module from the Computer Science programme, and I gained a better understanding of system security issues in relation to the various IERG cybersecurity courses. The final year project allowed me to explore cryptography and communication systems further. Unlike other courses, this research-based project requires students to figure out the problem and solution themselves. Through delivering presentations and writing reports, students are required to clearly explain their research topic to others within a certain amount of time, which is crucial for workplaces. Entering the IERG programme provided me with many opportunities to explore different technologies and various full stack assessments, contributing to valuable experiences, an impressive resume and many benefits to my career.

The Mechanical and Automation Engineering (MAE) programme emphasizes the impact of modern automation technologies on current and future developments in the field of mechanical engineering. The programme stresses a balanced curriculum in both basic theory and hands-on practice, covering subject areas such as mechanics and materials, thermodynamics, mechanical design, manufacturing processes, mechatronics and robotics.

MECHANICAL AND AUTOMATION ENGINEERING

"Engineers should press forward with development to meet the diversified needs of people."
- Harold Chestnut (1981), American electrical engineer, control engineer and manager at General Electric

Programme Features

The curriculum offers a fundamental grounding in the areas of mechanical and automation engineering, including mechanics and materials, thermodynamics, control, manufacturing, and electronics. Students can pursue more in-depth knowledge in the subjects of their choice, such as computer-aided design and graphics, robotics, mechatronics, intelligence systems, engineering optimization and MEMS. Students may choose to specialize in one of the following three streams or not to specialize in any stream:

- Design and Manufacturing
- Mechatronics
- Robotics and Automation

Courses in business, technical communications, engineering ethics, design application and final year projects are included in the programme to enhance students' training as future professionals. The department also provides summer internships, work-study programmes and international exchange opportunities for its undergraduate students.

Career Prospects

Upon graduation, MAE students find career opportunities as mechanical engineers, production engineers, control engineers and design engineers and other professions that rely on the programme's engineering training. They can also pursue graduate studies in their specialized areas of interest in Hong Kong or overseas.

SY Hiu Yin Emily
2020 BEng (Mechanical and Automation Engineering) graduate
Graduate Trainee, ATAL Engineering Limited

I am grateful to CUHK, particularly the MAE department which has helped me to explore my ambitions and launch my career as an engineer. Upon graduation, I joined ATAL Engineering Limited. The MAEG programme meant I was qualified for my work of upgrading wastewater and stormwater drainage services, including but not limited to the San Wai Sewage Treatment Works and the Yuen Long Effluent Polishing Plant. For example, the knowledge I gained in the major core course 'Fluid Mechanics' has enabled me to calculate pressure drop and perform pipework sizing. In addition, my specialization in Robotics and Automation has helped me to alleviate the shortage of welders and accelerate construction by implementing a robotic arm. The MAEG programme combines mechanical engineering knowledge and programming, keeping pace with the times. It has also paved the way for me to embark on my Master of Data Science with a fellowship presented by the University Grants Committee.

KWAN Lok Bond Boris
2016 BEng (Mechanical and Automation Engineering) graduate
Project Engineer, Airport Authority Hong Kong

I chose MAE as it offers unparalleled exposure within the field of engineering, ranging from classic engineering theories to the familiarisation with and application of programming and computer-aided design (CAD). The programme has allowed me to acquire all-round knowledge as well as discover my interests to further pursue studies after graduation.

It is evident that artificial intelligence and CAD will be hot topics in the next decade, and I consider MAE the perfect complement to these areas. This has proved to be the case, as I have decided to pursue a career with AAHK, in which engineers are required to manage mechanical systems such as the Automated People Mover and Baggage Handling System while taking the initiative in proposing innovative engineering solutions to different challenges.

Tel: (852) 3943 8044 I Email: dept@mae.cuhk.edu.hk I www.mae.cuhk.edu.hk

SYSTEMS ENGINEERING AND ENGINEERING MANAGEMENT

The Department of Systems Engineering and Engineering Management uses information technologies and mathematical tools to tackle the problems that arise in the study of complex, man-made systems such as supply chains, financial markets, logistics management, transport networks and business operations. Our undergraduate programme offers students a well-rounded education that equips them with the knowledge and skill-set necessary to compete not only in Hong Kong—a major financial and logistics centre with a thriving service industry—but also in the knowledge- and technology-based global economy.

> "Not enough of our society is trained how to understand and interpret quantitative information. This activity is a centerpiece of science literacy to which we should all strive—the future health, wealth, and security of our democracy depend on it. Until that is achieved, we are at risk of making under-informed decisions that affect ourselves, our communities, our country, and even the world." –– Neil DeGrasse Tyson

Programme Features

Our undergraduate programme offers intensive training in the fundamentals of information systems, decision sciences, technology management and entrepreneurship. In addition, the programme offers the following two specialized streams:

- Business Information Systems – focuses on the design, analysis and management of effective systems for storing, communicating and extracting information, which form the backbone of modern-day business and industrial operations.

- Decision Analytics – equips students with decision analytical skills such as statistical models, system simulation and optimization methods. The students will incorporate such skills in the decision making in a broad class of industries which include logistics and supply chain management, banking, healthcare system, and so on. There are three sub-areas within this specialized stream:

1. Financial Engineering – emphasizes on the use of advanced quantitative techniques and information technologies to manage and execute financial strategies.
2. Logistics and Supply Chain Management – concerns with the coordination and management of material, financial and information flows of an enterprise's operations.
3. Service Engineering and Management – combines interdisciplinary knowledge to support operations and create value in the ever-growing service industry.

Career Prospects

Training in Systems Engineering and Engineering Management provides exposures to interdisciplinary knowledge and a solid understanding of both technical and economic aspects of complex systems.

Our graduates typically take up positions in logistics management, financial analysis, consulting, information technologies and related fields. Many are currently enjoying very successful careers in organizations such as HSBC, Deloitte, IBM, P&G and Kelly Logistics.

Wisely NATALIA
2021 BEng (Systems Engineering and Engineering Management) graduate
Software Engineer, JP Morgan Chase

As a technology and business enthusiast, I found SEEM to be the perfect major that fits my interest and aspirations. The wide array of courses offered that tackle problems from varying industries have helped me gain a broader understanding of how the market works and the different ways we can optimize its operation. From a mathematical to management approach, SEEM has equipped me with different skill sets to solve problems from multiple perspectives. It was a rewarding experience to take this program for my undergraduate studies. I highly recommend it to fellow students who are interested in solving business problems through technical approaches!

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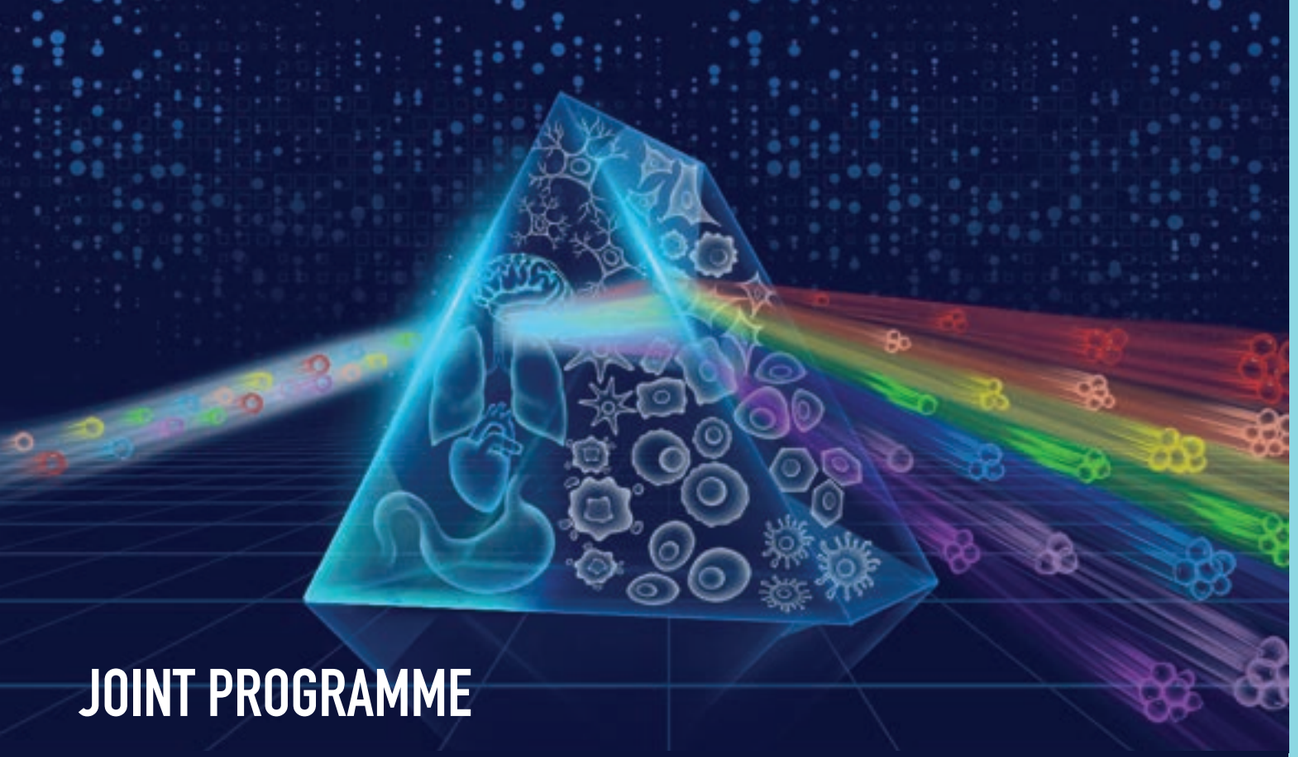
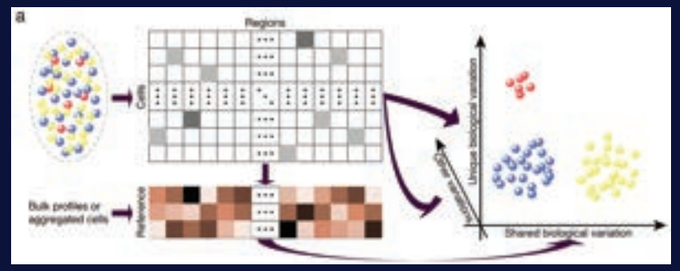


JOINT PROGRAMME

COMPUTATIONAL DATA SCIENCE

Offered by Department of Computer Science and Engineering and Department of Statistics

The data-driven era creates strong interests and needs of analyzing, storing, distributing, and sharing massive amounts of data using sophisticated data analytics and machine learning algorithms and methodologies, with applications in multiple disciplines including science, social science, finance, public health, medicine, engineering, and telecommunications. Huge job demand of data analysts in both local and global employment markets has been witnessed.



Programme Overview

This programme focuses on in-depth academic training in the domain of computational data science. It aims to equip students with the capabilities of applying both

1. High-performance parallel and distributed computing for big data manipulation, and
2. Data-driven statistical procedures, methodologies and theories for mining patterns, making predictions, and discovering sciences from large and complex datasets.

Such capabilities enable students to develop cutting-edge massive data analytics and management solutions that are of practical interest to academics, industry, and society.

Programme Features

- Solid inter-disciplinary curriculum
- Several specializations (i.e., the X component)
- "Computer Science/Statistics + X" programme

that apply the core knowledge of computational data science to different science, engineering, and medicine disciplines:
(a) Computational Data Science;
(b) Computational Physics;
(c) Computational Medicine;
(d) Computational Social Science

CDAS			
Faculty Package	Programming Linear Algebra Advanced Calculus Discrete Mathematic Data Structure Probability Statistics Python R, SAS C++	Required courses	Algorithms & Computer Systems Artificial Intelligence Operating Systems Machine Learning / Data Mining / Statistical Learning Survey Methods / Statistical Computing / Bayesian Learning Statistical Inference / Applied Regression Analysis Nonparametric Statistics / Categorical Data Analysis
Major Foundation		Research Practicum	Final Year Project

Stream	
Elective Courses	Computational Data Science Computational Physics Computational Medicine Computational Social Science

"Engineering Leadership, Innovation, Technology and Entrepreneurship (ELITE) Stream (Faculty of Engineering)"

Undergraduate Research Training

All students of our programme are required to take a 6-unit research-driven project course to work with professors of the University Central Cluster on real-world interdisciplinary problems. Via the project, students will learn how to formulate scientific or industrial problems into data science problems and tackle them with computational and statistical methods. As a result, our graduates will be well-prepared to join the workforce to solve practical computational data science problems upon graduation.

Local / International Competitions

A variety of non-classroom activities throughout the school years will be arranged. In particular, students are encouraged to participate in project competitions in data analytics or related disciplines, such as supercomputing contests, programming contests, Knowledge Discovery and Data Mining Cup, Microsoft Imagine Cup, etc. Through the competitions, students will learn how to address real-world problems in computational data science. Both the hands-on experience and ranking from the competitions will be a huge plus for students' future job search and career development.

Career Prospects

Computational data science is a rapidly evolving interdisciplinary field that is in high demand. Future graduates will be prepared for careers that create order and derive meaning from huge amounts of data. This program prepares graduates for careers require the deep knowledge and skills of machine learning, database management, and high-performance computing with an adequate statistics background. Future alumni could work as business intelligence analysts, data mining engineers, data modelers, data scientists, engineers and developers, data warehouse architects and research analysts, etc.

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JOINT PROGRAMME

LEARNING DESIGN AND TECHNOLOGY

Offered by the Faculty of Education, Faculty of Engineering and Faculty of Science

Programme Overview

The Bachelor of Science Programme in Learning Design and Technology is a 4-year integrative programme jointly offered by the Faculties of Education, Engineering and Science. Its design is based on the latest re-formulation of the science of education in which education is cast as "a metadiscipline or discipline of disciplines" to equip learners with knowledge, competencies, and leadership to facilitate learning and development in and beyond the formal education settings. Graduates of the programme will be equipped with multi-disciplinary knowledge in education, technology, and science with education and learning sciences serving as the unifying threads. Not only will students be provided with internship opportunities to consolidate theory-practice integration, but they will also carry out research projects to synthesize multi-disciplinary knowledge and action-science competencies.

Programme Features

- Integrative, multi-disciplinary programme in education, technology and science
- Theory driven, action-science oriented, and lab-based learning approach
- Integrated STEM education with technology-based and multi-media instruction in multicultural contexts
- Service learning competencies through education and community engagement
- Research in technology, science and transdisciplinary studies in and beyond STEM education
- Articulation with the teacher professional programmes in technology- and/or science-related teaching and other research-based postgraduate programmes in education and/or technology-related disciplines

Career Prospects

Graduates of the programme can pursue professional careers in schools, school-sponsoring bodies, government sectors, non-governmental organizations (especially those specializing in solving social problems by means of education), education-related companies and industries in local, regional, and global settings including the Greater Bay Area. Graduates are equipped to serve in a variety of settings where there is an interface between education and STEM, including industries, businesses, schools, non-governmental organizations, and other new and emerging education-related industries. Additionally, graduates who want to pursue a teaching career can continue their study in the teacher professional programmes to obtain a technology- and/or science-related teaching qualification.

LDTE-related careers

- Learning designers / strategists
- Learning technology specialists
- Multimedia learning specialists
- Technology-supported learning environment designers
- STEM education designers
- Science / technology teachers
- Educational product developers
- E-learning consultants / trainers
- Technology managers / officers
- Educational data analysts
- Education officers / administrators / researchers

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JOINT PROGRAMME

MATH IS OUR PASSION AND ENGINEERING IS OUR PROFESSION.

MATHEMATICS AND INFORMATION ENGINEERING

This programme is offered jointly by the Department of Mathematics and the Department of Information Engineering to provide students with advanced, diverse knowledge in the interdisciplinary study of mathematics and engineering. This demanding boutique programme aims at educating a new generation of leading information scientists who are well-trained at the cutting edge of communications, computer networks, algorithm design, and formal mathematics.

Programme Features

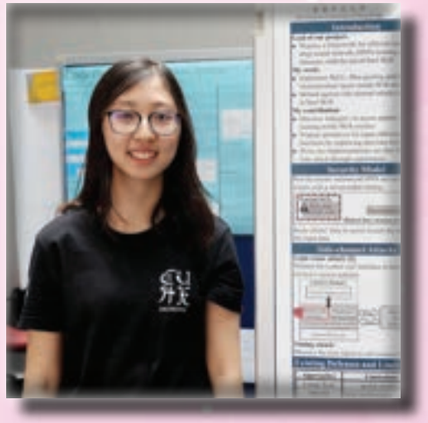
The programme places strong emphasis on research and encourages independent study under the supervision of professors from both departments. Students enjoy opportunities to take up research work towards the end of the course, and a significant proportion of graduates from this small programme get to pursue graduate studies in the top schools worldwide.

Career Prospects

The career prospects of graduates of this programme are very promising thanks to the unique combination of abstract mathematical thinking abilities and solid engineering know-how for tackling problems. Career opportunities are available in a diversity of fields including (but not limited to):

- Research – students can pursue postgraduate studies in areas related to mathematics, information engineering, or computer science
- Information analysis – graduates work in analysing and processing information in quantifiable forms for the finance and banking industries
- Engineering – engineering careers related to networking, security, and system management are open to graduates in this field.

WOO Pui Yung Anna
2022 BSc (Mathematics and Information Engineering) graduate
Currently a PhD student in Computer Science and Engineering at the University of Michigan



I have had a very productive university experience at CUHK Engineering. My major programme, Mathematics and Information Engineering, is a good fit for my interests. Comprising both theory and practice, the course not only gave me solid knowledge in areas such as communication systems and signal processing from the programme, but also allowed me to develop problem-solving skills and abilities to generate innovative solutions. The learning environment was also positive and supportive, with teachers always welcoming students to ask questions, and students exchanging ideas and learning from each other.

The Faculty of Engineering also provides plenty of opportunities for students to engage in research under the supervision of professors at CUHK and other top universities. These opportunities helped me to build a solid foundation for research.

My journey at CUHK Engineering has been fascinating. I am extremely grateful to the programme and the faculty for their support and education.

Tel: (852) 3943 8385 I Email: admin-mieg@ie.cuhk.edu.hk I www.mie.cuhk.edu.hk

DOUBLE DEGREE OPTION

Engineering and Business Administration Double Degree Option

Hong Kong has transformed into a technology-enabled service economy, and the demand for engineers has changed. There are growing desires for many enterprises from small scale to large corporates like banking and finance to recruit professionals with IT and related expert knowledge. Students graduated from this double degree option will be equipped with both strong technical and business knowledge, making them extremely competitive in the job market.

Programme Structure

Eligible students could pursue their first bachelor degree at the Faculty of Engineering with a selected major (BMEG, CENG, CSCI, ELEG, EEEN, FTEC, IERG, MAEG or SEEM), and after completing the first degree, pursue the second bachelor degree at the Faculty of Business Administration for one year. Students would be awarded a Bachelor of Engineering and a Bachelor of Business Administration (BBA) in Integrated Business Administration (IBBA) upon completion of both programme requirements.

Features

- No admission quota
- Students will first complete the Engineering degree before completing their second degree in the last year on self-financed basis. Students will need to take some Business Administration courses during the study period of the first degree.
- Students eventually do not join the second degree in Integrated Business Administration will be awarded a Minor in Integrated Business Administration in recognition of the credit units earned from the IBBA courses if they have fulfilled the relevant academic requirements of the IBBA Minor programme.

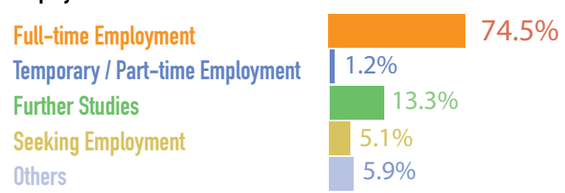
www.erg.cuhk.edu.hk/ergbba

CAREER PROSPECTS

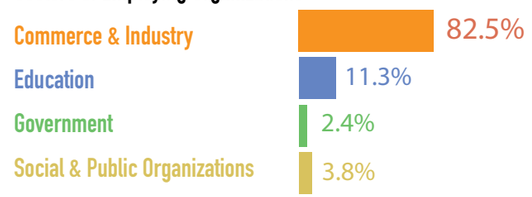
Graduates of the Faculty of Engineering of The Chinese University of Hong Kong have always been put on the top priority by employers. The multi-disciplinary and multi-talent training offered by the Faculty prepares its students best for a wide magnitude of career choices both in the business and government sectors. Quite a number of engineering graduates started their own business and become successful entrepreneurs. Apart from this, many of our graduates have pursued their postgraduate studies and taken up the teaching and research work in local and overseas prestigious institutions.

Job Statistics of Full-time Engineering Graduates 2021

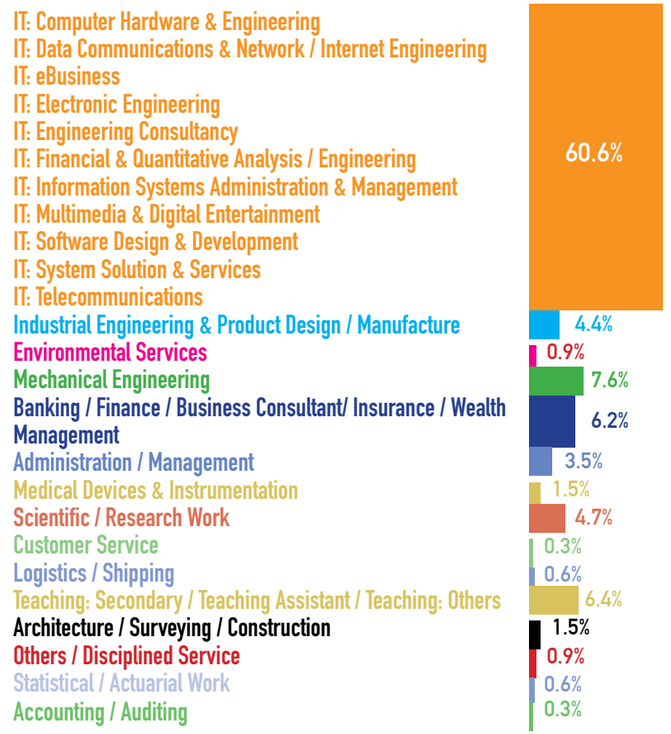
Employment Status



Sectors of Employing Organizations



Career fields



Successful entrepreneur's story –

An energetic social mobile solution company

Computer Science & Engineering graduate Louis LI is passionate about making a direct impact with his solid experience in engineering design. His team at RedSo develops new solutions to manage web-based mass queueing systems and prevent website crash due to high online traffic. The system allows operators to control traffic peaks of a website that may expect hundreds of thousands of visitors for high-demand sales events, flash sales and/or quota allocations.

"The covid-19 outbreak has made desperate crowds to crash websites for surgical masks, but I am glad my team has ultimately helped deliver smooth experience for end users. Technology does play a vital role in our life and I believe engineering is a great career changing the world in a better way" says Li. Together with his business partner Eric Ng, Louis has grown the team to over 30 employees, many of whom are also graduates of CUHK Engineering.

ADMISSIONS

JUPAS Admission
Secondary school students taking the Hong Kong Diploma of Secondary Education (HKDSE) Examination should apply for admission through the Joint University Programmes Admissions System (JUPAS). To be admitted to CUHK, an applicant must first fulfill the university and programme-specific subject requirements. Please refer to the website of the Office of Admissions and Financial Aid for further information.

http://admission.cuhk.edu.hk/jupas

Non-JUPAS (Local) Admission

Local applicants holding other qualifications can apply through the non-JUPAS admission scheme. These qualifications include Associate Degree/Higher Diploma, GCE-AL, IAL, IB, SAT/AP and other overseas qualifications for university admission. Applications will be assessed on a case-by-case basis. Please refer to the website of Office of Admissions and Financial Aid for further information.

http://admission.cuhk.edu.hk/non-jupas-yr-1

International Students Admission

Applicants who require a student visa to study in Hong Kong shall apply through this scheme. Applicants must possess relevant high-school or post-secondary qualifications, which include GCE-AL, IAL, IB, SAT/AP, GSAT (Taiwan), OSSD (Canada), ATAR (Australia), and other relevant qualifications. Applications will be considered on a case-by-case basis. Please refer to the website of Office of Admissions and Financial Aid for details.

http://admission.cuhk.edu.hk/international

Admission with Advanced Standing

A non-JUPAS (local) or international applicant may apply for "Admission with Advanced Standing" if he/she meets specific requirements with relevant qualifications (including GCE-AL, IAL, IB, associate degree/higher diploma). For students admitted with Advanced Standing, the minimum number of units for graduation may be reduced by up to 23 units (normative period of study may be shortened by up to one year).

Senior-Year Admission for Sub-degree Holders

Applicants holding the qualification of associate degree or higher diploma can apply for direct admission to senior-year places. Applicants admitted to the senior-year places are generally expected to complete their undergraduate studies in two years. For the 2023-24 entry, nine engineering programmes offer senior-year places. They are namely, Biomedical Engineering, Computer Engineering, Computer Science, Electronic Engineering, Energy and Environmental Engineering, Financial Technology, Information Engineering, Mechanical and Automation Engineering, Systems Engineering and Engineering Management.

Admission through National Colleges and Universities Enrolment System

Mainland students, who are current Gao Kao candidates, are welcome to apply through the National Colleges and Universities Enrolment System. Applicants may refer to the website of Recruitment of Mainland Students http://admission.cuhk.edu.hk/sc/mainland for details.

Admission Scholarships

The Office of Admissions and Financial Aid, colleges, academic and administrative departments altogether offer plenty of scholarships each year. These scholarships provide not only recognition and encouragement to outstanding students, but also some financial support to needy students. The Faculty offers various entrance scholarships to newly admitted students with excellent entrance results in public exams. For the 2022 entry, about 50 students were awarded the Faculty Admission Scholarships.

Award Criteria for Admission Scholarships

For JUPAS Students

Dean's Award (Remarks)

Achievements (Marks in any best 5 subjects)	Scholarships by the Faculty
35 marks	(i) Cash award of $56,000 (renewable)
33–34 marks	(i) Half Tuition (renewable); AND (ii) Cash award of $30,000 (renewable)
30–32 marks	(i) Half Tuition (one-off); AND (ii) Cash award of $30,000 (one-off)

Scholarships by the University

(Information of 2022 entry is listed for reference. Scholarship information of 2023 entry will be announced through the Office of Admissions and Financial Aid.) Website: admission.cuhk.edu.hk

Achievements	Scholarships by the University
Level 5** in 6 or more subjects	(i) Full Tuition (renewable); (ii) Annual Allowance of $20,000 (renewable); AND (iii) One-off Exchange Scholarship of $30,000
Level 5** in 5 subjects	(i) Half Tuition (renewable); AND (ii) One-off Exchange Scholarship of $10,000
Level 5** in 4 subjects	(i) Half Tuition (one-off) (ii) One-off Exchange Scholarship of $10,000
Level 5** in 3 subjects	(i) Scholarship: $10,000 (one-off) (ii) One-off Exchange Scholarship of $10,000
Level 5** in 2 subjects	Scholarship: $5,000 (one-off)

Students eligible for scholarships have the opportunity to be awarded for both scholarships by the University, the Faculty and the academic department. The exact amount is subject to the University regulations.

Calculation of Marks

Conversion Table

HKDSE Level	5**	5*	5	4	3	2	1
Mark	7	6	5	4	3	2	1

Remarks:
Mathematics Extended Module 1 or 2 is counted as one subject for scholarship considerations.

For Non-JUPAS (Local) and International Students

Admission Scholarships will be provided to non-JUPAS (local) and non-local applicants admitted with outstanding entrance grades in public examinations such as GCE-AL, IAL, IB diploma, etc.

For Sub-degree Holders

$10,000 scholarship will be offered to students admitted to the Faculty with the qualification of "Distinction" of their Associate Degree or Higher Diploma from institutions in Hong Kong.

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