Engineering is all about problem-solving. It is the art of using scientific and mathematical principles, together with innovations, to develop technologies that benefit mankind. CUHK’s far-sighted vision led it to begin offering engineering-related programmes as early as the 1970s.

The Faculty of Engineering was formally established in 1991 under the leadership of Professor Charles Kao, former Vice-Chancellor of CUHK and the 2009 Nobel Laureate in Physics. Since its inception, the Faculty has been 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.

**Engineering (broad-based admission)**

Under the broad-based admission scheme, the Faculty admits applicants with HKDSE qualifications to six of its undergraduate programmes. Applicants are required to apply for CUHK Engineering (JUPAS Catalogue No.: JS4401) when they submit their JUPAS applications.

The new academic structure offers students four years of study. They take common foundation courses in their first year of study while exploring the features of the Faculty’s various engineering programmes. Eligible students would be invited to declare their major from the following list of undergraduate programmes after their first year of study.

- Computer Engineering
- Computer Science
- Information Engineering
- Mathematics and Information Engineering*
- Mechanical and Automation Engineering
- Systems Engineering and Engineering Management

* The Mathematics and Information Engineering programme is jointly offered by the Department of Information Engineering and Department of Mathematics.

Students can prioritise their choice of major according to interests, which are the Faculty’s most important consideration in determining major allocations. Wherever possible, and depending on resources and facilities (e.g., lab facilities), the Faculty attempts to accommodate students’ preferences. Students with outstanding HKDSE results or excellent academic performance in their first year of study are granted ‘guaranteed admission’ to their first choice of major. In addition, the Faculty offers admission scholarships to newly admitted students with excellent entrance grades in public examinations. Please refer to the Faculty’s website for scholarship details.

To nurture engineering and technology leaders, the Faculty regularly updates its professional study programmes and upgrades its facilities, particularly its computing facilities and its electronic and information systems. The Faculty also offers a range of enhancement programmes designed to turn students into multi-talented engineers. The enhancement programmes include:

- The **Engineering Leadership, Innovation, Technology and Entrepreneurship (ELITE) stream**, which strengthens students’ problem-solving skills, intellectual curiosity and critical-thinking ability by tasking them with challenging coursework. An ELITE stream designation is officially recorded on the academic transcripts of those who

Website: www.erg.cuhk.edu.hk
Facebook page: www.facebook.com/cuhkengg
- A work-study scheme, which requires students to spend one term or a full year working as full-time employees in a programme-related company to equip themselves with practical experience.
- An engineering student exchange programme, which offers engineering students overseas exchange study opportunities that widen their horizons, enhance their language abilities and encourage them to become more independent.
- A research internship programme, which prepares highly motivated, high-capacity students for postgraduate studies and research careers by offering early training in research skills.
- Non-engineering minors, including minors in business administration, economics, journalism, music and psychology, which develop students' interests and talents in disciplines other than engineering.

The Faculty’s teaching staff are highly qualified academics with a strong commitment to educating engineering professionals. They are also active in basic and applied research and have made significant contributions to the advancement of modern technology.

**Computer Engineering**

The Computer Engineering (CE) programme was formally established at the Faculty of Engineering’s inauguration in 1991. A balanced programme with an emphasis on both computer hardware and software, the CE programme distinguishes itself by offering specialised training in computer design, mobile embedded systems, microprocessors and very large-scale integrated circuit (VLSI) design.

Advances in VLSI and microprocessor technology have led to the ongoing development of such innovative products as smart phones, 3D TVs, digital cameras, supercomputers and computer games. The CE programme equips graduates to meet the new challenges and opportunities that lie ahead. Many of our graduates have pursued successful careers in local and international companies, including HSBC, Intel, Microsoft, IBM and Google, and others have chosen to further their studies in our own postgraduate programme or those of internationally renowned universities overseas.

The CE curriculum comprises courses addressing the following 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 structures, operating systems, algorithms, software engineering
- VLSI design: computer-aided design and applications
- System connectivity: computer networks

Other advanced topics include:

- Hardware-accelerated bio-related processing
- Hardware-aided security
- Multi-core systems and architecture

- Reconfigurable computing
- Supercomputing

The Computer Engineering/Integrated Business Administration Double-Degree option is open to students who are qualified for admission to both programmes. Following the successful completion of a BEng degree in Computer Engineering, students can continue their studies for an additional year to gain a BBA degree.

For more details, please visit the programme website at www.cse.cuhk.edu.hk.

**Computer Science**

The Computer Science (CS) programme was launched by the Department of Computer Science and Engineering more than 30 years ago. It is accredited by the Hong Kong Institute of Engineers (HKIE) and has gained an international reputation for research and teaching excellence.

Over the years, the Department of Computer Science and Engineering has built up a large alumni network within Hong Kong’s computer industry. Many of our graduates have taken up important positions in such organisations and companies as the Hong Kong Government, HSBC, Intel, Microsoft, IBM and Google. This wide network offers our graduates a competitive advantage in professional career development. Rather than pursuing a position in industry, some graduates have chosen to enter our Master’s or doctoral programmes or similar postgraduate programmes in world-renowned universities overseas.

The CS programme covers the following areas:

- Artificial intelligence
- Computer and network security
- Computer networking
- Computer-aided design
- Databases
- Digital hardware technologies
- Information systems
- Internet
- Multimedia technology
- Programming languages
- Software engineering
- Theoretical computer science
The Double-Degree Computer Science/Integrated Business Administration option is open to students who are qualified for admission to both programmes. Following the successful completion of a BSc degree in Computer Science, students can continue their studies for an additional year to gain a BBA degree.

For more details, please visit the programme website at www.cse.cuhk.edu.hk.

**Information Engineering**

The Information Engineering Programme (IE) is designed to nurture and educate engineering leaders for the Information World of today and tomorrow. We offer all-round training in the areas of communications systems and networks, Internet engineering, cybersecurity, mobile and cloud computing, multimedia processing, big data, as well as software engineering. Our professors are dedicated educators and world-class researchers. Many of them have extensive experience with leading research institutions world-wide before joining the department.

**Programme Features**

Information Engineering encompasses the generation, distribution, analysis and application of information in engineering systems. Key areas of study include:

- Telecommunications: Optical Networks, Wireless Communications, Analog and Digital Circuits, Switching Systems, Teletraffic Theory, Network Coding, Information Theory;
- Big Data and Multimedia: Image and Video Processing, Multimedia Coding, Web-scale Information Analytics, Programming Big Data Systems, Building Scalable Internet Services, Social Media and Human Information Interaction; and

Students may choose to specialise in one or more of the five streams—Big Data, Communications, Cyber Security, Internet Engineering, and Enrichment Streams.

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 innovate creative solutions for important practical problems. Our graduates have embarked on successful careers in various sectors and companies, including Morgan Stanley, HSBC, Smartone, IBM, MTR, Google, and more, or have started their own business. Around 10% of our graduates further their graduate studies in top schools including CMU, MIT, Stanford, Berkeley, Caltech, Cambridge, and more.

For more details, please visit the programme website at www.ie.cuhk.edu.hk.

**Mathematics and Information Engineering**

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

The programme places strong emphasis on research and encourages independent studies under the supervision of professors from both Departments. Students will have opportunities to take up research work during their later years of study and a significant fraction of graduates from this small programme get to pursue graduate studies in the top schools worldwide.

The career prospects of graduates are very promising because of the unique combination of abstract mathematical thinking abilities and solid engineering know-how for tackling problems. Career opportunities cover a diversity of fields including (but not limited to): (i) Research – pursue postgraduate studies in areas related to mathematics, information engineering, or computer science; (ii) Information analysis – analyse and process information in quantifiable forms for the finance and banking industries; (iii) Engineering – engineering careers related to networking, security, and system management.

For more details, please visit the programme website at www.mie.cuhk.edu.hk.
Financial Engineering

The Mechanical and Automation Engineering (MAE) programme emphasises the influence of modern automation technologies on current and future developments in the field of mechanical engineering. The curriculum balances fundamental theory and hands-on practical experience with the goal of producing engineers who can innovate and adapt to our technologically evolving society.

The curriculum covers fundamental knowledge within the areas of mechanical and automation engineering, including mechanics and materials, thermodynamics, control, manufacturing and electronics. Students can also pursue more in-depth knowledge in subjects of their choice, such as computer-aided design and graphics, robotics, mechatronics, intelligence systems, engineering optimisation and micromechanical systems (MEMS). Additionally, MAE students can optionally choose to specialise in one of three streams: Design and Manufacturing; Mechatronics; or Robotics and Automation.

Courses in engineering ethics, business and entrepreneurship, and technical communication, along with a year-long capstone project, are included in the programme to better prepare students to become professional practitioners. The Department also offers our students various undergraduate summer internships, work-study programmes and international exchange opportunities.

Upon graduation, MAE students enjoy careers as mechanical, production, control and design engineers, among other professions. They can also pursue graduate studies in their specialised areas of interest in Hong Kong or overseas.

For more details, please visit the programme website at 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.

Our undergraduate programme offers the following four specialisation 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.
- **Financial Engineering** emphasises the design and analysis of innovative financial instruments and strategies, along with the use of advanced quantitative techniques and information technologies to manage and execute those strategies.
- **Logistics and Supply Chain Management** is concerned with the coordination and management of the material, financial and information flows of an enterprise’s operations.
- **Service Engineering and Management** is a recently introduced specialisation that combines interdisciplinary knowledge, such as information technologies, cognitive science, economics and marketing, to support operations and create value in the ever-growing service industry.

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 such organisations as HSBC, Deloitte, IBM, P&G and Kelly Logistics.

For more details, please visit the programme website at www.se.cuhk.edu.hk.

**BEng in Financial Technology**

Financial Technology (FinTech) is an emerging engineering discipline that focuses on employing technological innovations in financial practices. Leveraging on the cutting-edge developments of engineering, in particular information technology and data sciences, it demonstrates an unprecedented potential to revolutionise the nature of traditional financial service industry in a fundamental way.

The advents of digital currencies, crowdfunding platforms, robot investment advisors, big data analytics, and algorithm driven trading strategies profoundly impact the means and behaviour of how people make payments online and offline, store and manage their wealth, and finance their businesses. On the one hand, FinTech significantly improves end-users’ service experience, making the financial industry more inclusive and productive. On the other hand, it demands an understanding of its social benefits and risks from the economic, technological, and legal viewpoints, so as to foster its healthy development.

The mission of the FinTech programme is to educate and equip students with the essential knowledge and capabilities 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. After four years of all-round education, students are expected to be able to:

- derive and develop financial and managerial insights from big data;
- design and engineer innovative solutions to meet financial service needs;
- optimise financial decisions in complex business environments; and
- understand and analyse the social, economic, security, and legal impacts of their solutions.

This new programme is built upon a strong collaboration...
of the graduates also choose to pursue postgraduate studies in local or overseas institutions.

For more details, please visit the programme website at www.ee.cuhk.edu.hk.

**BEng in Biomedical Engineering**

Biomedical Engineering (BME) is a fast-growing interdisciplinary field in which engineering and technology are innovatively applied to solve biological and medical problems for mankind. The field is responsible for the development of such medical instruments as MRIs, electrocardiographs, cardiac pacemakers, orthopaedic implants, rehabilitative devices, medical robotics, minimally invasive endoscopes, etc. Biomedical devices are also being developed at the micro- and nano-scale to enable diagnosis and therapeutics at the molecular and cellular levels.

Our BEng (Hons) programme in BME is jointly supported by Faculty of Engineering and Faculty of Medicine, and coherently organised under BME Department to facilitate student learning on campus, in hospitals, and with internships local and overseas. Students not only benefit from learning 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 career interests. 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.

The programme’s specialty areas are:

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

BME graduates work in hospitals, universities, government departments, other public organisations 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 sales, clinical engineering, regulatory affairs and entrepreneurship in technology. Around 25% of our graduates pursue further studies in various engineering and medical disciplines, some all the way to PhD. Our top students with interest and track record in research are eligible for potential
enrolment in the CUHK MBChB programme on an accelerated track.

For more details, please visit the programme website at www.bme.cuhk.edu.hk.

**BEng in Energy and Environmental 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 renewable, 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 to attaining viable solutions.

Interdisciplinary by design, the programme strongly leverages the relevant expertise and capabilities offered by CUHK as a comprehensive university. In addition to the fundamental knowledge of energy principles, technologies and systems, the programme features a number of required and core elective courses co-designed with the Earth System Science programme and the School of Architecture, and a host of elective courses from the Environmental Science programme and the Department of Geography and Resource Management, for a broader and in-depth education on 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 professional practitioners. Students are able to participate in and benefit from the many campus and community projects and research topics offered by the university-based institutes and units on environmental studies and sustainable development. They can also enjoy ample opportunities for summer internships, work-study programmes and international exchanges.

The knowledge and skills gained by students of the programme will afford them strong career prospects. They will be 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 can land jobs in the 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 can also pursue postgraduate studies in their specialised areas of interest in Hong Kong or overseas.

For more details, please visit the programme website at www.eeen.cuhk.edu.hk.

**BEng in Artificial Intelligence: Systems and Technologies**

(Artificial Intelligence [AI] is an emerging engineering discipline that focuses on the technological innovations in enabling computing systems to behave and discover new knowledge with humanlike intelligence. It is a broad area that covers many specialisations, such as machine learning, deep learning, knowledge representation/inference, logic/constraint programming, human-computer interactions, natural language processing, big data analytics, etc. It has evolved in multiple disciplines, such as finance, medicine, manufacturing, robotics, multimedia, telecommunications, computational linguistics, etc., and there is now a huge demand for AI specialists in both local and global employment markets. On the other hand, there are 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 with AI.

Our newly proposed programme is designed to meet today’s tremendous need of well-trained talents in AI and related specialisations. It aims to equip students with the capabilities of designing and implementing AI systems and technologies that can analyse, reason about, and infer knowledge from massive information, backed by rigorous foundations of mathematical modelling, data structures, statistics, algorithms, distributed computing, etc. Such capabilities enable students to develop cutting-edge AI solutions that are of practical interest to academics, industry, and society.

The programme offers four optional specialised streams for students to choose according to their own interests:

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

For more details, please visit the programme website at www.eeen.cuhk.edu.hk.