

JS4460

BENG (HONS) IN BIOMEDICAL ENGINEERING

Biology

Medicine

Biomedical
Engineering

Engineering

What is Biomedical Engineering?

Biomedical engineering (BME) is an interdisciplinary field dedicated to addressing **biological** and **medical** challenges for the benefit of humanity by applying **engineering** principles and techniques. The Biomedical Engineering (BME) programme is offered by the Faculty of Engineering via deep collaboration with Faculty of Medicine.

Programme Highlights

- Students in the BME program receive core engineering and medical training, with flexibility to choose electives aligned with their career goals.
- BME plays a crucial role in developing innovative medical technologies, such as MRI machines, brain-computer interfaces, and minimally-invasive endoscopes, with a focus on micro- and nano-scale applications.
- Students can engage in extensive biomedical engineering research within the University, enhancing their expertise.
- Supported by the CUHK Faculty of Engineering and Faculty of Medicine, students learn on-site at the Prince of Wales Hospital and CUHK Medical Centre, exploring how technology improves clinical services.
- CUHK offers unique interdisciplinary BME education, integrating the Faculty of Medicine, Engineering, and Business Administration, within a collegiate system for holistic education.
- Accredited by the Hong Kong Institution of Engineers (HKIE), ample opportunities for industrial and academic placements.
- The multi-disciplinary BME program prepares graduates for diverse careers in hospitals, government, and industry, with options for further studies locally and abroad.
- Our top students with interest and track record in research are eligible for potential enrollment in the CUHK MBChB program in an accelerated track.



You can view the full ranking here: ShanghaiRanking's Global Ranking of Academic Subjects
<https://www.shanghairanking.com/rankings/gras/2024/AS0208>



Admission Scholarships

Ample scholarships are available through multiple sources – the Office of Admission and Financial Aids, Colleges, the Faculty of Engineering, as well as the Department of Biomedical Engineering to encourage students to participate in international competitions and conferences.

In the previous years, around 20% of our newly admitted students have received an Admission Scholarship (in one-off or renewable offer), the highest admission scholarship received is up to full-tuition coverage per academic year.

Admission Criteria



JUPAS Admission



Non-JUPAS (Local Year 1) Student Admission



Non-JUPAS International Student Admission



Non-JUPAS Senior-Year Admission for Sub-degree Holders



Mainland Gao Kao Admission

1. JUPAS Admission (JS4460)

We are looking for students who like science subjects, love to EXPLORE, INNOVATE and CARE, are passionate about learning in breadth as well as in-depth, ready to acquire new knowledge across disciplines, and eager to apply their learning to solve real-life problems in the medical and healthcare industries.

Students are expected to have completed at least two elective subjects plus the four core subjects. Priority score is computed based on the Best 5 HKDSE subject results with subject weighting as below:

4 Core Subjects	Minimum Level	Subject Weighting
English Language	3	1.5
Chinese Language	3	1
Mathematics (Compulsory Part)*	3	1.5
Citizenship and Social Development	Attained	-
2 Elective Subjects	Minimum Level	Subject Weighting
Biology / Chemistry / Physics / Mathematics Extended Module (M1 / M2)*	3	1.5
Other elective Subject	3	1

*Subject weighting of 1.5 is given to the best Mathematics subject (either the core Mathematics or the M1/M2 Extended Module)

3. Senior-Year Admission for Sub-degree Holders

- i. Local students who completed a local course of study leading to the qualification of an Associate Degree / a Higher Diploma, and
- ii. Attained an acceptable level of proficiency in English and Chinese languages.

2. Non-JUPAS (Local Year 1) & International Student Admission

Local and non-local students with other qualifications can also apply through the non-JUPAS admission scheme. These qualifications include GCE, GCE-AL, IB, SAT/AP and other overseas qualifications for university admission. Preferences are given to applicants with good grades in at least two of the following subjects - Physics, Chemistry, Biology, or Mathematics.

Applicants who meet specific requirements as stipulated by the University for particular qualifications (including GCE-AL / International-AL, IB, Cambridge Pre-U, HKALE, associate degree / higher diploma) may apply for "Admission with Advanced Standing". The minimum number of units for graduation for students admitted with Advanced Standing may be reduced by up to 24 units (normative period of study may be reduced by up to one year).

Reference Scores for Major International Qualifications:

Programme	Lowest reference score range		
	IB Diploma	GCE AL / IAL	SAT / AP
Biomedical Engineering	33-35	ABB to AAB	1350-1450 in SAT 700-750 each in 2 SAT Subject Tests 3-4 each in 2 AP Tests

Reference scores are compiled with reference to admission statistics in 2023,2024, and 2025 entries.

Note: Admission is not based on public examination results alone, and the overall scores of students admitted to each programme vary from year to year, the information provided is for reference only and should not be used to predict the chance of admission to any programme in subsequent years.

4. Mainland Gao Kao Admission

Students from Chinese Mainland who are current Gaokao candidates must apply through the National Colleges and Universities Enrolment System.

Curriculum

Year 1

Foundation Courses

Biology / Chemistry, Engineering Physics, Engineering Mathematics

Fundamental BME Major Courses

Introduction to BME, Anatomy and Physiology, Hospital Experience and Engineering Practicum

Year 2

Foundation Courses

Programming, AI Literacy Workshop

Fundamental BME Major Courses

Biomechanics, Complex Analysis and Differential Equations, BME Laboratory, Cell and Molecular Biology, Circuits and Signals, Engineering Physics, Ethical Practice, Statistical Techniques

Year 3

Advanced BME Major Courses

Biomedical Imaging, Biomaterials and Tissue Engineering, Medical Instrumentation and Design, Global Medical Device Regulations

Year 4

One-year Work-study Programme (optional)

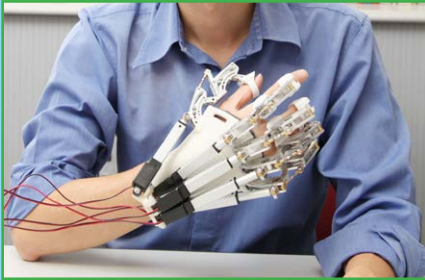
Year 4 or 5

Graduation Project
Electives for BME Streams

Streams

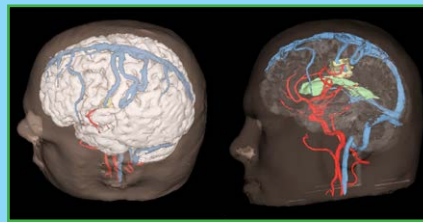
Medical Instrumentation & Biosensors

- Big Data in HealthCare
- Biofluids
- BioMEMS
- Cardiovascular Engineering
- Medical Robotics
- Neuroengineering
- TeleMedicine & Mobile Healthcare



Biomedical Imaging, Informatics & Modeling

- AI & Imaging for Biomedical Engineering
- Big Data in HealthCare
- Bioinformatics
- Cardiovascular Engineering
- Data Analytics for Personalized Genomics and Precision Medicine
- Wearable Biomedical Devices and Personalized Healthcare



Molecular, Cell & Tissue Engineering

- Biomolecular Engineering
- Bionanotechnology
- Cardiovascular Engineering
- Data Analytics for Personalized Genomics and Precision Medicine
- Genetic Engineering
- Musculoskeletal Tissue Engineering



BME + Business Administration Double-Degree Programme

- 1st degree: Bachelor of Engineering (Biomedical Engineering)
- 2nd degree: Bachelor of Business Administration (Integrated BBA Programme)
- Collaborated with the Faculty of Business Administration

For further information, please refer to the Faculty website at <http://www.erg.cuhk.edu.hk/ergbba>

Minor Programme

- Students can take up to two minors programmes
- 18-30 units for each minor programme

Practical Training

Students are required to participate in a four-week professional and practical summer training on CUHK main campus and at Prince of Wales Hospital (PWH) and CUHK Medical Centre (CUMC). The in-house training involves electronic circuit design, simulation, fabrication, interfacing with software, data acquisition, and wireless communication, while the hospital training, students can experience the daily operation information flow and logistics in the running of a hospital. They will also learn about the fundamentals and the clinical use of medical instruments. The training provides a valuable chance for students to relate theory and engineering knowledge to practice in a real-world setting.

Student Sharing

POON Chi Yung

Summer hospital Training 2024

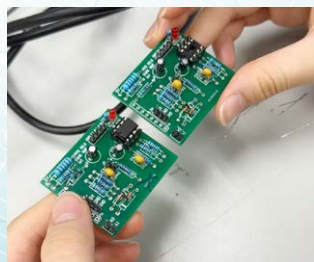
The Practical Training in the Summer Term is divided into two parts: the in-house training and the hospital training. In the in-house training, students will learn how to build a finger pulse meter, which can measure heart rate and display photoplethysmogram PPG. We learnt how to design PCB circuit board using EAGLE and use EasyEDA to simulate the circuit. We assembled the components on PCB and soldered by ourselves. We learnt Arduino coding. We also processed raw data using LabVIEW and MATLAB. Finally, we designed the finger clip hardware using SolidWorks.

In the hospital training part, we had lectures and lab visits conducted by different departments in the Prince of Wales Hospital and the CUHK Medical Centre. We saw the DXA machine for diagnosing osteoporosis. The lecturers introduced various imaging techniques to us. We also learnt briefly about haemodialysis and peritoneal dialysis for patients with kidney failure and observed the haemodialysis machine. Moreover, we visited the Electrical and Mechanical Services Department. We learnt how they secure electricity supply in the hospital, and how they maintain and repair those medical instruments. During lab and hospital visits, we saw instruments like the endoscope, ultrasound imaging machine, and infusion pump. We also saw how the machines in hospital labs can analyse patients' samples automatically. We watched a live broadcast demonstration of a computer-assisted total knee arthroplasty surgery. On the last day, we even got the chance to visit the operating theatre. An anaesthesiologist introduced to us different instruments that may be used during an operation to put a patient into general anaesthesia.

Overall, I think the summer Practical Training was very fruitful. The in-house training introduced me to different software useful for designing any medical devices. The hospital training gave me a taste of the work and daily routine of a biomedical engineer.



Student drilling through a 'bone' with aid of computer images



Self-soldered PCB

Experiential Learning

Design Competitions

- iGEM, International Genetically Engineered Machine Competition at Giant Jamboree in Boston, USA
- Engineering Medical Innovation Global Competition in Taipei
- Hong Kong University Student Innovation and Entrepreneurship Competition
- ASM Technology Competition



Local Summer Industrial Internships

- CUHK Medical Centre
- Gleneagles Hospital
- Hong Kong Adventist Hospital (Tsuen Wan & Stubbs Road)
- Hong Kong Government Electrical and Mechanical Services Department
- Hospital Authority
- Prince of Wales Hospital
- St. Paul's Hospital



Overseas Summer Research Internships

- Columbia University, US
- Imperial College, UK
- Stanford University, US
- University of Toronto, Canada
- University of Sydney, Australia
- National University of Singapore, Singapore



Work-Study Programme

One year of full-time experience working as an employee in the biomedical engineering industry.



Overseas Exchange

University provides overseas exchange opportunities to students to immerse in multi-cultural settings and to enrich their study life and personal experience. Many undergraduate students in Biomedical Engineering participate in overseas exchange programmes around the world.

Recent examples include:

- Aston University, UK
- Eidgenossische Technische Hochschule Zurich, Switzerland
- Ecole Polytechnique Federale De Lausanne, Switzerland
- Fudan University, China
- Graz University of Technology, Austria
- Lille Catholic University, France
- Nanyang Technological University, Singapore
- National University of Singapore, Singapore
- Shanghai Jiao Tong University
- Simon Fraser University, Canada
- Singapore University of Technology and Design, Singapore
- The University of Sydney, Australia
- University of Pennsylvania, USA
- University of Liverpool, UK
- University College London, UK



Photo taken during the exchange students' Welcome Tea at the beginning of the semester. I am the person wearing a grey shirt on the right.



Photo taken at the NUS Study Abroad Fair 2025, an event to promote CUHK as an exchange destination for NUS students, with other CUHK student ambassadors. I am the girl in the middle of the first row.

Student Sharing

Michelle LEE

Overseas Exchange at National University of Singapore (NUS) in 2024

I'm excited to share my experience from my exchange semester at the National University of Singapore (NUS).

During my time at NUS, I took three courses: Cell Biology, Practical Synthetic Biology, and French. I chose the first two to deepen my biology knowledge for future research projects. Cell Biology really enhanced my critical thinking and research skills through rigorous lectures and coursework focused on interpreting research data. In Practical Synthetic Biology, I got hands-on experience with experiments and connected with various professors, which was invaluable.

I also took French because I developed an interest in the culture during my visit to Paris last year. Learning from a native speaker was a delightful experience and helped me appreciate the language and culture even more.

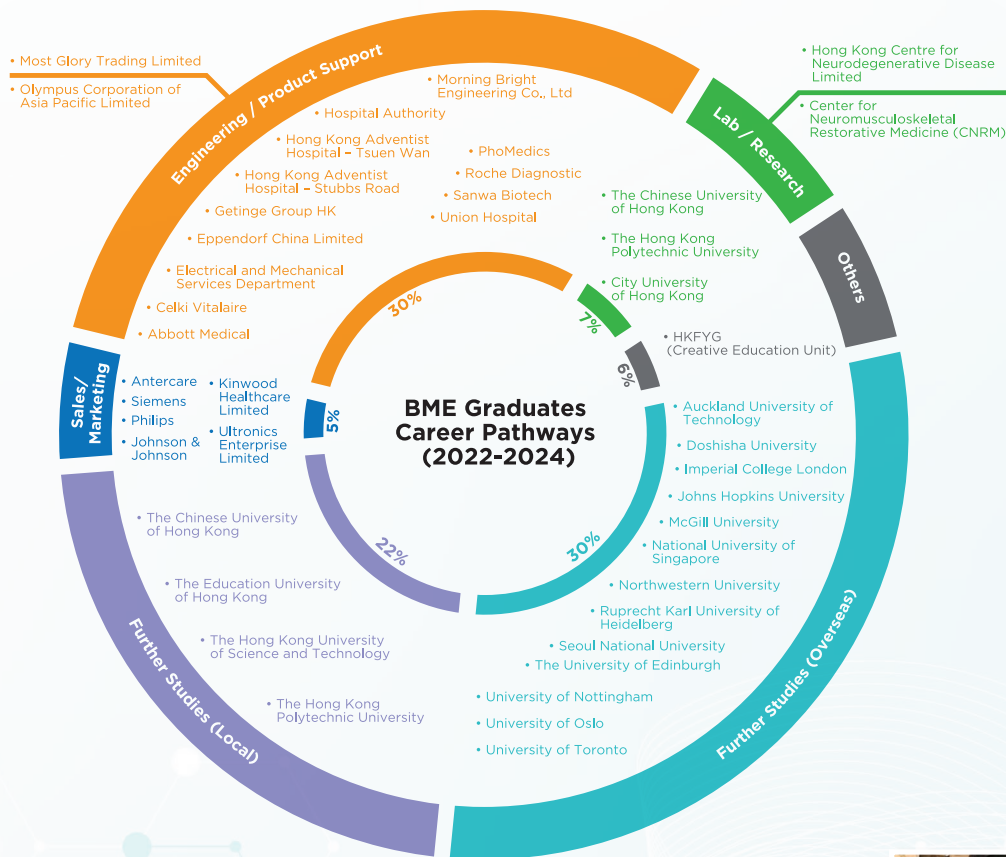
Outside of classes, I made connections with local Singaporean friends and other international students. I attended board game sessions at NUS to unwind and socialize, and I participated in activities organized by the NUS Peer Advising, such as the welcome tea and NUS Games Day. Additionally, I joined a seminar about pursuing postgraduate programs at NUS, which opened up new perspectives on my goal of pursuing a PhD. I even had discussions with professors about advice for my application.

Overall, this exchange experience was incredible. I learned to adapt to a new environment and met wonderful people along the way. This adaptability will be a valuable lesson for my future, especially if I move abroad for my postgraduate studies.

Career Opportunities

Employment of biomedical engineers is expected to grow much faster than the average for all occupations. The aging population and the focus on health issues will increase the demand for better medical devices and equipment. The development of biomedical engineering is therefore a worldwide trend. Our graduates are pursuing the following career paths.

- Manufacturing Industries
- Clinical Engineers in Hospitals
- Entrepreneurs in Biotech Companies
- Regulatory Affairs
- Distribution & Sales
- Testing Laboratories
- Research Scientists & Engineers
- Further Studies (MSc, PhD, MD, MBA, PCLL)



Alumni Sharing

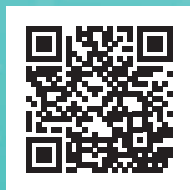
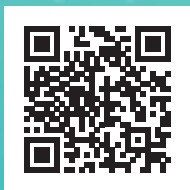
Callie Wong Cheuk Yiu

BME Undergraduate Student Graduated in 2023

I graduated from CUHK BME in 2023, and now I am pursuing a PhD at the University of Edinburgh. I gained a lot from my four years at CUHK. I am glad to have had excellent support from BME professors, that allowed me to gain undergraduate research experiences, to engage in different research projects, and of course, I am thankful for the guidance I received for my PhD applications. My interest in research started with me being a summer research student in Professor Duan's Lab via the undergraduate summer research internship by the Faculty of Engineering, and I am now on the other side of the world working on my own PhD project.

I found the BME lectures to be fun and exciting. I chose to specialise in the Molecular, Cell and Tissue Engineering stream, and enjoyed the lecture time with my peers. I particularly enjoyed the hands-on BME laboratory courses, which were very popular among BME students. We got the chance to perform experiments inside the lab to have a grasp of the work behind the scientific theories discussed during lectures and we were encouraged to think beyond the lecture notes.





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