



Bachelor
of Engineering
(Bioengineering)

Bachelor of Engineering
(Chemical & Biomolecular Engineering)

SCBE

School of Chemical and Biomedical Engineering

Advancing a Sustainable Future through Chemical and Biomedical Innovation

“ADVANCING A SUSTAINABLE FUTURE THROUGH CHEMICAL AND BIOMEDICAL INNOVATION”



INTRODUCTION

Core areas of Chemical & Biomolecular Engineering and Bioengineering expertise are being augmented by new expertise in science and engineering at molecular and nanometer scales – in biosystems, sustainability, and in cyber tools. Be the catalyst to advance wide-ranging fields spanning biotechnology, pharmaceuticals, medical devices, and more.

Chemical & Biomolecular engineers and Bioengineers have unique backgrounds that allow you to apply fundamental principles and problem-solving skills to many different areas of need, such as energy, water, materials, medicine, and others. Even as these areas of need evolve, you will be ready.

Due to the cross-disciplinary nature encompassing biology, chemistry, materials, physics, advanced mathematics, and all the wide-ranging research areas observed today, you will be well-positioned to address and harness technological and societal opportunities yet to be conceived. Embark on this exciting journey with us - the future is full of potential and opportunity for you.

WHY SCBE

Our accredited Chemical Engineering (CBE) and Bioengineering (BIE) programmes offer you a state-of-the-art curriculum that is industry-centric. Our students experience a holistic educational experience and thrive beyond classroom learning:

- Get a competitive edge as a leader of the future by solving real-world multidisciplinary issues. Our students are prepared with well-rounded advanced chemical engineering or bioengineering engineering skillsets – developed through close collaborations with the industry and professional internships with practical training exposure.
- Fast-track your career in the new era of chemical engineering or bioengineering industries. We empower you with entrepreneurship skills at the interface between engineering and the business world.
- Realise your fullest potential as your creativity and leadership skills are nurtured in our stimulating, dynamic and energising environment that is specially tailored with inputs from industry and our Career Attachment Office.



Fresh graduates with a **HIGH EMPLOYMENT RATE** and attractive **GROSS MONTHLY SALARY** in Singapore



Offers **DIRECT-HONOURS DEGREE** programmes



RANKED 12TH in the world in the QS World University Rankings by Subject 2019



World **RENOWNED PROFESSORS**



WORK AND LEARN WITH THE BEST STUDENTS

from Singapore and the region



GLOBAL IMMERSION PROGRAMME (GIP)

Opportunities for six-month stints
- choose from more than 300 universities around the world



UNDERGRADUATE RESEARCH ON CAMPUS (URECA) PROGRAMME*

Opportunities for research attachment within NTU

*Students need to satisfy certain requirement to be eligible for these special programmes offered by NTU



PROGRAMMES OFFERED

CBE CHEMICAL & BIOMOLECULAR ENGINEERING PROGRAMMES



B.ENG. (HONS) CHEMICAL & BIOMOLECULAR ENGINEERING

Second Major

- B.Eng. (Hons) Chemical & Biomolecular Engineering with 2nd Major in Business*
- B.Eng. (Hons) Chemical & Biomolecular Engineering with 2nd Major in Food, Science and Technology[†]

Double Degree

- B.Eng. (Hons) in Chemical & Biomolecular Engineering & B.A. (Hons) in Economics[^]

Specialisations:

- Advanced Pharmaceutical Manufacturing
- Intellectual Property
- Machine Learning and Data Analytics

* In collaboration with the Nanyang Business School

[†] In partnership with the Wageningen University (The Netherlands), NTU School of Biological Sciences and School of Physical and Mathematical Sciences

[^] Jointly offered with the College of Humanities, Arts and Social Sciences



ADMISSION REQUIREMENTS

In addition to satisfying the General Entry Requirements of NTU Singapore, candidates must have a minimum of:

- H2 level (or equivalent) pass in Mathematics, and
- H2 level (or equivalent) pass in Physics/Chemistry/Biology/Computing

Candidates with relevant diplomas from local polytechnics may apply for admission.

BIE/ BIOENGINEERING PROGRAMMES



B.ENG. (HONS) IN BIOENGINEERING

Second Major

- B.Eng. (Hons) In Bioengineering with 2nd Major in Business*
- B.Eng. (Hons) In Bioengineering with 2nd Major in Food, Science and Technology⁺
- B.Eng. (Hons) In Bioengineering with 2nd Major in Pharmaceutical Engineering

Double Degree

- B.Eng. (Hons) in Bioengineering & B.A. (Hons) in Economics[^]

Specialisations:

- Advanced Pharmaceutical Manufacturing
- Intellectual Property
- Machine Learning and Data Analytics

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Candidates with relevant diplomas from local polytechnics may apply for admission.

ABOUT CHEMICAL & BIOMOLECULAR ENGINEERING

“ MODERN CHEMICAL AND BIOMOLECULAR ENGINEERING IS FOCUSED ON PIONEERING VALUABLE NEW MATERIALS AND TECHNIQUES. ”

Chemical and biomolecular engineering is the branch of engineering that deals with the application of physical (e.g., chemistry and physics) and life (e.g., biology, microbiology and biochemistry) sciences, along with mathematics and economics, to convert raw materials or chemicals into more valuable forms. Applications span food science, carbon capture and utilisation, pharmaceuticals and drug delivery, nanotechnology, fuel cells and biomedical engineering.

The Chemical and Biomolecular Engineering programme at NTU aims to equip a new generation of chemical and biomolecular engineers with the right skill sets to meet the challenges of the chemical and biomedical sciences industries in Singapore and the world.

Our accredited** undergraduate programme incorporates biomolecular engineering and physical sciences with chemical engineering principles. This is a four-year direct honours undergraduate degree programme in Chemical and Biomolecular Engineering (CBE). Students are empowered to solve challenging problems in chemical & biomolecular engineering and its related areas and better understand the implications of these solutions on society.

Our young Chemical Engineering programme is ranked 12th globally in the QS World University Rankings by Subject in 2019. Since our establishment in 2004, we have attracted the best students from Singapore and the region.

INDUSTRIES AND CAREER OPPORTUNITIES

- **Manufacturing industries:**
 - Pharmaceutical/bio-pharmaceuticals
 - Specialty chemicals/petrochemicals
 - Oil and gas
 - Semiconductor
- **Research and development:**
 - Nanotechnology
 - Biotechnology
 - Process and product development
 - Biomedical
 - Food/flavours/fragrances
- **Trading and finance related jobs in relevant industries**

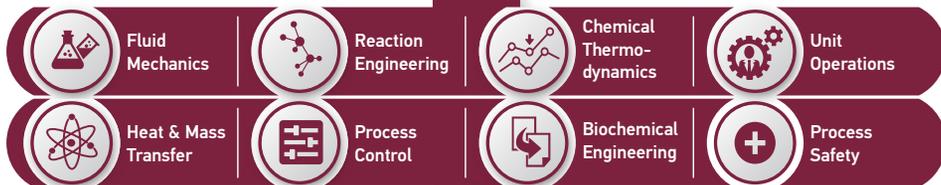


**The degree programme in Chemical and Biomolecular Engineering is accredited by the Engineering Accreditation Board (EAB) of the Institution of Engineers Singapore (IES).

CURRICULUM OVERVIEW



The CBE curriculum combines principles of chemical engineering and life sciences (biology, biochemistry and genetics) to enable the development of safe, profitable and environment friendly processes for the synthesis and manufacture of chemical/biological products.



ABOUT BIOENGINEERING

“ WE CONCENTRATE ON APPLYING KNOWLEDGE TO INNOVATIONS IN HEALTHCARE WITH A FOCUS ON ENTREPRENEURSHIP. ”

Areas of bioengineering seamlessly fuses the various disciplines of engineering and biomedical science as one. Both fields are complementary; the core technologies from engineering are applied in several biomedical science areas and has led engineering to progress into areas including biomedical imaging, biomedical instrumentation, biomaterials and tissue engineering.

The Bioengineering programme at SCBE empowers students with advanced skill sets to apply fundamental principles and methods of engineering to address industrial trending challenges in bioengineering, medical/life sciences and its related areas, and to understanding the implications of these solutions on real-life industry situations.

The School offers a four-year direct honours undergraduate degree programme in Bioengineering (BIE). The accredited* programme blends modern biological principles with advanced engineering methods in electronics, materials, mechanics and computing to

develop the best engineers for biomedical and biotechnology industries as well as healthcare and clinical services.

The curriculum aims to meet the needs of the biomedical industry in Singapore and better prepare our graduates for immediate employment in the healthcare industry. We concentrate on applying knowledge to innovations in healthcare with a focus on entrepreneurship.

In modules such as Biomedical Project Design & Management and Medical Device Design, students are exposed to look specifically into practical design aspects of medical devices. We have also introduced labs sessions such as bio imaging, so that students can have hands-on experiences. Our commitment to our students ensures that we continuously evolve by providing a balanced, in-depth programme through free electives, which will better prepare our graduates for the rigorous demands of today's bioengineering industry.

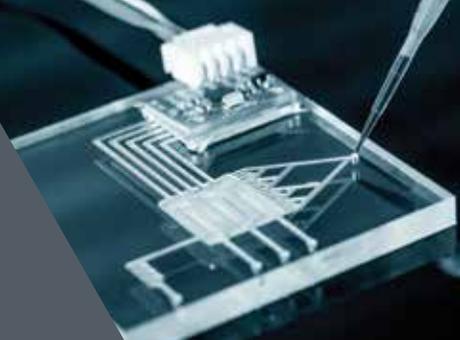
INDUSTRIES AND CAREER OPPORTUNITIES

- **Manufacturing industries:**
 - Pharmaceutical/bio-pharmaceuticals
 - Semiconductor
 - Biomedical instrumentation
 - Medical devices
 - Biomaterials
- **Regulatory affairs**
- **Trading and finance related jobs in relevant industries**
- **Research and development:**
 - Biotechnology
 - Drug discoveries
 - Biomedical instrumentation
 - Medical devices
 - Biomaterials
 - Start ups

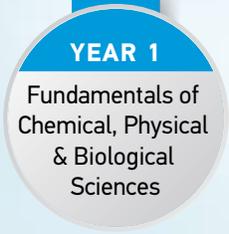
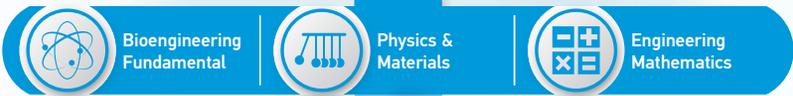
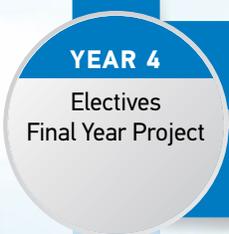
*The degree programme in Bioengineering is accredited by the Engineering Accreditation Board (EAB) of the Institution of Engineers Singapore (IES).



CURRICULUM OVERVIEW



The BIE curriculum blends modern biological principles with advanced engineering methods in electronics, materials, mechanics, biocomputing and informatics to train high standard engineers for biomedical and biotechnology industries, as well as for healthcare and clinical services.



WE BELIEVE THAT EDUCATION EXTENDS BEYOND THE CLASSROOM



Academic Competitions

As one of the world's top universities, we are proud of our curriculum, which is developed and delivered at our world-renowned faculty. But while an excellent curriculum is one aspect of a holistic education, it's also important to put our content to the test.

Especially in today's digital world, where content is readily available, *context* and *application* are becoming increasingly important.

By participating in a wide range of academic competitions – from beer brewing to chemically-powered cars to synthetic biology – our students explore and learn. They have fun, they try, they fail and they try again. And in the process, find out what the textbook concepts really mean.



Overseas Competitions



While local competitions provide an excellent test of students' knowledge and capabilities, competitions on foreign soil challenge students' expertise in different ways – expanding their minds with new ways of tackling familiar issues and applying concepts into real-life situations.

Making Lifelong Friends

Our courses and activities – both in and out of the classroom – see bonds developed and lifelong friendships built.



Overseas Programs

“Getting out of the classroom” takes on a whole new meaning as an overseas exchange student. As the world becomes increasingly connected, adaptability becomes a key trait for today’s graduates and professionals.

Our students are given opportunities to gain these lifelong skills by participating in overseas seminars and conferences, professional internships and semester-long student exchange programs – building their personal and professional capabilities in the process.



Career Development

For many fresh graduates, entering the workforce can feel like a daunting next step. They worry about job suitability, have insecurities over their skills and competencies, or may just be unsure about how to weigh the varied options in front of them.

SCBE assists students with this transition by organising career talks, alumni sharing and networking sessions, as well as industry visits. We also bring in industry experts, who share their career experiences and keep students informed of the latest developments in their fields.

Because preparing for life after university, starts right here at SCBE.



Join Us On this
Exciting Journey:

Like our
Facebook page

Follow our
Instagram page





PROGRAMME ENQUIRIES

School of Chemical and Biomedical Engineering
Nanyang Technological University
62 Nanyang Drive
Singapore 637459

Email: scbe@ntu.edu.sg

Website: www.scbe.ntu.edu.sg

ADMISSION ENQUIRIES

Office of Admission
Nanyang Technological University
Student Services Centre, Level 3
42 Nanyang Avenue
Singapore 639815

Email: adm_local@ntu.edu.sg (for local students)

adm_intnl@ntu.edu.sg (for international students)

Website: <http://admissions.ntu.edu.sg/UndergraduateAdmissions>

