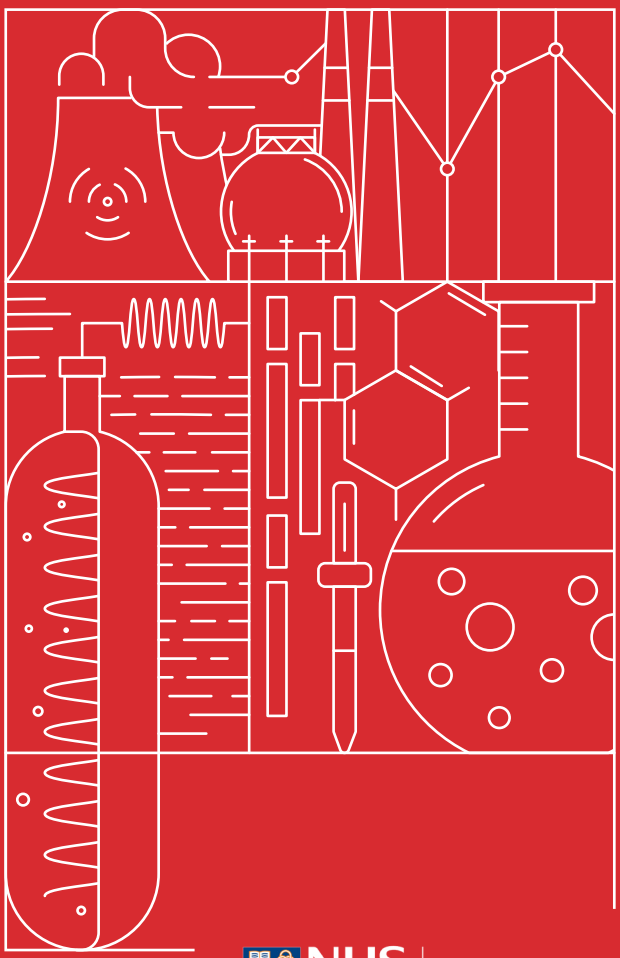
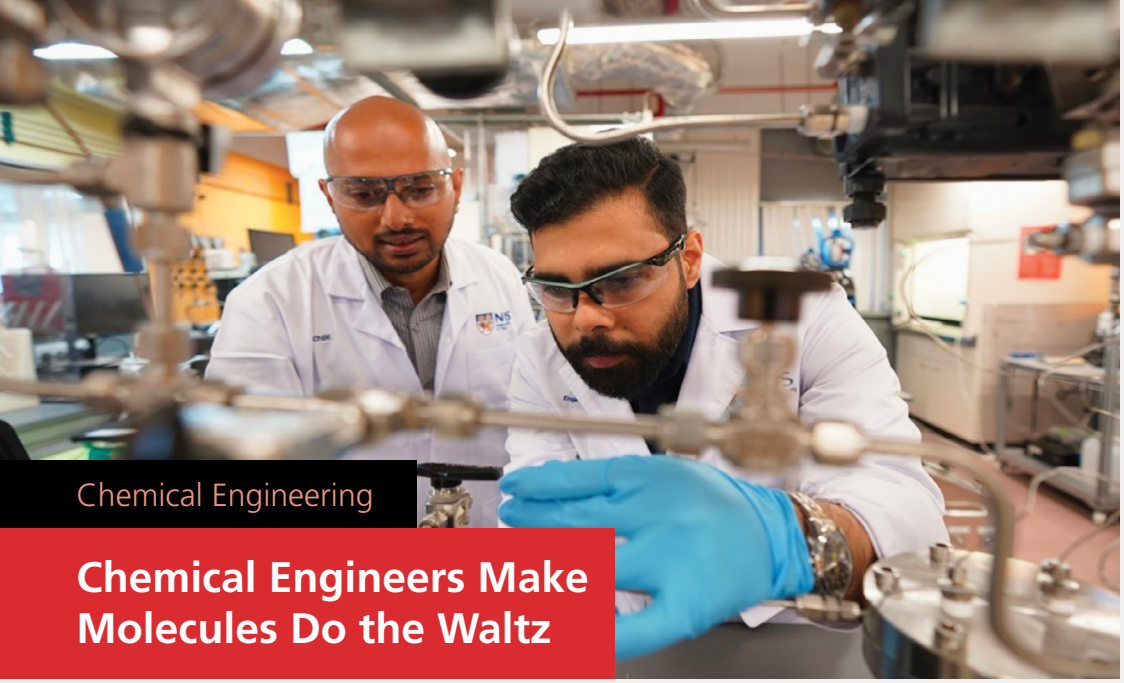


NUS National University of Singapore | College of Design and Engineering

CHEMICAL ENGINEERING

BACHELOR'S DEGREE PROGRAMME



Chemical Engineering

Chemical Engineers Make Molecules Do the Waltz

What is Chemical Engineering?

If you want to improve lives by designing or optimising chemical processes to mass produce products like the COVID-19 vaccine, developing clean energy, or even extending the shelf life of food products, chemical engineering may be the right choice of engineering for you.

The chemical engineering degree is one of the most multifaceted engineering degrees. You will build on your knowledge of the chemical, physical, biological, and mathematical sciences to marshal the reactivity and transformation of invisible molecular building blocks in clean, efficient, scalable, and economical ways. Along the way, you will learn about dynamical systems, catalysis and reaction engineering, separation processes, advanced automation, and AI-driven process control.

Why Chemical Engineering?

Our strength lies in the core chemical engineering areas. Our faculty has expertise in chemical engineering sciences, advanced manufacturing processes, biomolecular and cellular engineering, data information and automation systems, clean energy and water, chemical product design and many more areas.

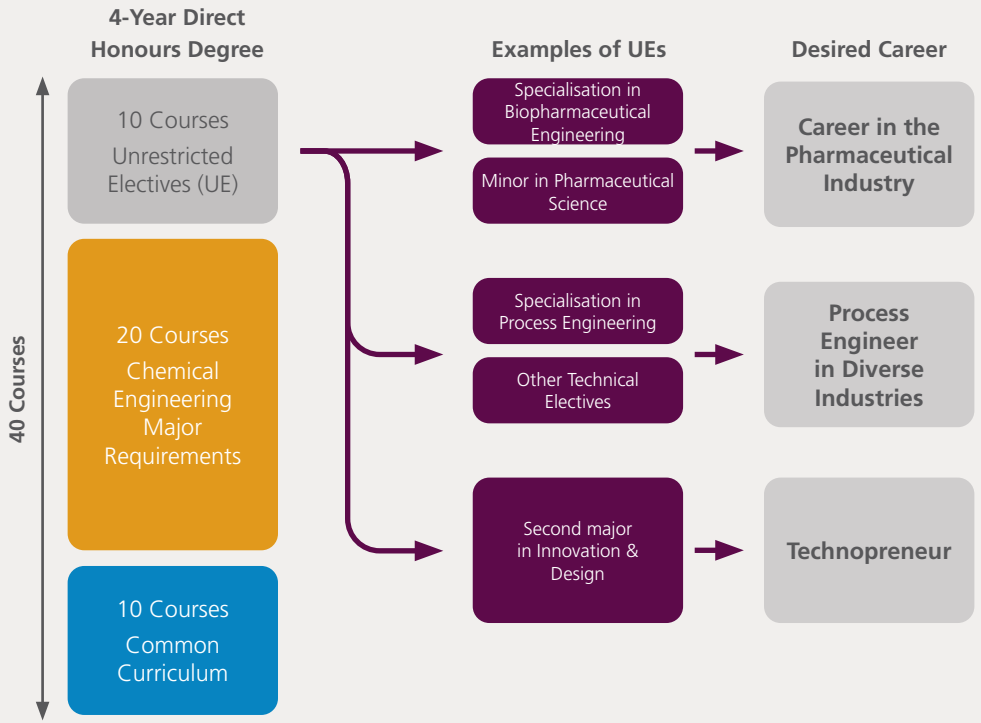
- One-third of our faculty are teaching award winners and employ sound pedagogies, providing the best learning experience for our students.
- From a career perspective, the sheer breadth and depth of the discipline open doors for our graduates across several industries, giving you the flexibility to choose a path that aligns with your interests and goals — the future is indeed molecular!

Career Opportunities

The career prospects of chemical engineering graduates are bright and exciting. Chemical engineers can pursue careers in many industries, including pharmaceuticals and biotechnology, foods, consumer products, semiconductors, materials, energy and chemicals. Chemical engineers, with their strong analytical and problem-solving skills, are also prized as consultants in the public and private sectors, and even play important roles in non-engineering fields like banking and finance.

About 10–15% of our graduates pursue further education, either locally or overseas. Major employers of chemical engineering graduates include Micron Semiconductor, ExxonMobil, GSK, MSD, GlobalFoundries to name a few.

Oil-Related Industries, Chemical Industries, Petrochemicals	Process engineer, Project engineer, Control engineer, Plant operations engineer, Plant utilities engineer, Process designer
Pharmaceutical and Biomedical Science Industries	R&D, Quality control engineer, Process automation engineer, Process engineer
Research Institutes & Centres, Educational Institutes, Financial Institutions	Educator, Research engineer, Research assistant
Engineering Design and Consultancies, and Government Bodies	Engineering consultant, Risk management, Data analyst, Project manager
Environmental, Health and Safety-Related Industries	Environmental, health and safety engineering, Process safety engineer, Infrastructure inspector, Equipment designer
Semiconductor and Electronics Industries	Semiconductor process engineer, Equipment/reactor designer, Process yield analyst



Our Specialisations:

1 Specialisation in Biopharmaceutical Engineering

Learn about the production, purification, formulation, delivery, quality control, and quality assurance aspects of biotherapeutics manufacturing to prepare yourself for a career in the pharmaceutical, biopharmaceutical, healthcare and even life sciences.

2 Specialisation in Process Engineering

Process engineering is the bread and butter of most chemical engineers. You will be exposed to the design, modelling, optimisation, operation, and control of chemical processes and gain practical and industrial experience.

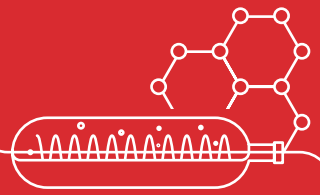
3 Specialisation in Safety and Sustainability

Be part of a safer and sustainable future. Learn about sustainable production that is pollution-free, energy-efficient, cost-effective, secure, socially favourable and safe for individuals working at the plant site, communities, and consumers.

Academic Journey

Year 1

You will start your journey by building an engineering toolkit. You will deepen your knowledge in mathematics, programming, data analytics, prototyping and project management. You will gain lab experience and even work on a project to make alcohol from fruits and vegetables!



Year 2

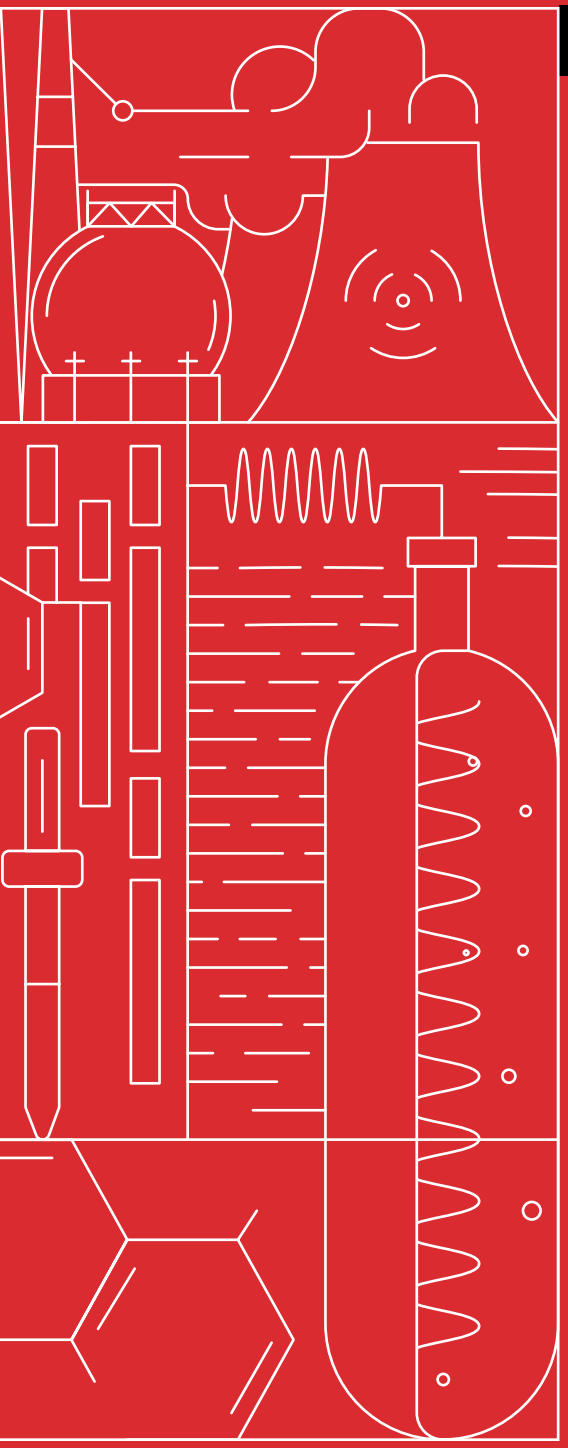
You will deepen your knowledge of Chemical Engineering principles through core courses like thermodynamics, learning about energy transformations, and reaction engineering, where you design chemical reactors — the heart of every process. You also can explore research opportunities through the Undergraduate Research Opportunities Programme (UROP).

Year 3

The courses become more specialised and you will tackle subjects like separation processes and process simulation and optimisation. The latter course introduces the use of software tools to analyse and improve process performance. You will also gain exposure to various related industries through industrial attachments. Overseas opportunities are also aplenty: student exchange programmes, summer/winter programmes and NUS Overseas Colleges (NOC).

Year 4

In your final year, you will apply your knowledge — from thermodynamics, transport processes, reaction and systems engineering to programming and optimisation — in the final year project to design a fully functional and optimised chemical plant.



Profile of Current Student

Theo Rajan Terence

Bachelor of Engineering (Chemical Engineering), Class of 2025
Alumnus of NUS High School of Mathematics and Science

"My education with NUS Chemical Engineering has been filled with both local and overseas opportunities to develop myself technically and holistically. For my industrial attachment, I was awarded the A*STAR Research Internship Award (ARIA) which gave me invaluable experience in research and laboratory work. In 2024, I had the chance to broaden my horizons and go on a full-year student exchange with Imperial College London. Besides academics, I also had the privilege to take up leadership positions in the American Institute of Chemical Engineers (AIChE) NUS Student Chapter – a great opportunity to hone my leadership skills!"

Profiles of Alumni

Cheng Woon Jo

Bachelor of Engineering (Chemical Engineering), Class of 2021
Master of Science, MS, Climate Studies at Wageningen University & Research
Alumna of Hwa Chong Institution

"My Chemical Engineering education at NUS equipped me with valuable technical and transferable skills. I gained a strong foundation in mathematics and physics and observed how chemical engineering principles were applied in different industries.

From living overseas through various university programmes, I learned to adapt quickly and connect with people from different cultures. I am thankful to the professors and department staff who went the extra mile to support me in my academic journey."

Jax Lee Jia Xing

Bachelor of Engineering (Chemical Engineering), Class of 2010
CEO of Nanolumi
Alumnus of Jurong Junior College

"The chemical engineering undergraduate journey isn't confined to mastering formulas in your discipline; it can be an expansive, cross-disciplinary expedition that could also actively incorporate an entrepreneurship mindset. Beyond the acquisition of technical competencies, it serves as a nurturing ground for fostering strong logical thinking and keeping the innovative spark. For me, I jumped headfirst into startups after graduating hoping I could make the world a better place. After many years as an entrepreneur, I learnt that the holistic fusion of diverse disciplines of chemical engineering isn't solely about creating solutions; it cultivates a mindset that not only generates answers but also instils the confidence to lead pioneering innovations heavily reliant on engineering principles."

Admission Requirements

Singapore-Cambridge GCE 'A' Level
A pass in H2 Mathematics or Further Mathematics.

Polytechnic Diploma
An accredited diploma.

International Baccalaureate (IB) Diploma
A pass in HL Mathematics: Analysis and Approaches.

NUS High School Diploma
A good major GPA in Mathematics.

International Qualifications
Applicants presenting international qualifications may apply with equivalent high school results.

Contact

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