NURTURING ENGINEER-LEADERS

UNDERGRADUATE STUDIES

BIOMEDICAL ENGINEERING
CHEMICAL & BIOMOLECULAR ENGINEERING
CIVIL & ENVIRONMENTAL ENGINEERING
ELECTRICAL & COMPUTER ENGINEERING
ENGINEERING SCIENCE
INDUSTRIAL & SYSTEMS ENGINEERING
MATERIALS SCIENCE & ENGINEERING
MECHANICAL ENGINEERING
VISION
A LEADING ENGINEERING SCHOOL THAT INNOVATES FOR A BETTER FUTURE.

MISSION
TO NURTURE ENGINEER-LEADERS AND TO ADDRESS GLOBAL CHALLENGES THROUGH RESEARCH, INNOVATION, INSPIRATION, AND INFLUENCE.
GETTING THE BEST OF A DIVERSIFIED WORLD AT ENGINEERING
Opportunities abound to learn beyond the classroom through our international student exchange programmes, and internships in start-ups in Silicon Valley, New York, Shanghai, Beijing, Stockholm, Israel and Munich via the NUS Overseas Colleges.

NUS Engineering’s undergraduate research programme also provides opportunities for anyone interested to explore innovative solutions. The Faculty’s major degree programmes are accredited by the Engineering Accreditation Board of Singapore, which is a signatory of the Washington Accord. This means that NUS Engineering graduates are recognised as having met the academic requirements for engineering practice in other countries that are also signatories, including Australia, Canada, China, Hong Kong, Japan, New Zealand, the UK and USA.
Engineering is a wide field with numerous disciplines, engineering skills and knowledge that may be applied in diverse ways to meet the needs of an increasingly technology-advanced world. It is a field rich with opportunities, recognised for its impact in creating technology and products that help make life easier.

Engineers are shaping the future by applying their skills in almost every sector, from medicine to renewable energy, from food technologies to the sustainable environment. There really is no limit to what engineers can do today.

Given the variety of career opportunities in engineering now available, at NUS Engineering we help students better prepare themselves for a career that best suits their interests and aspirations through three differentiated pathways. What they share is a common disciplinary function of core and technical elective modules. What differentiates them is mainly the focus of the compulsory internship, final year project, and pathway-specific modules.
**INNOVATION & DESIGN-CENTRIC PATHWAY (iDCP)**

iDCP is for students who are keen to develop new ideas/products or pursue technopreneurship. Students will work in teams with their peers from other engineering disciplines, or on multi-year projects to solve problems and develop new technologies. They will also read entrepreneurship modules and intern at local start-up companies.

**PRACTICING PROFESSIONAL PATHWAY (PPP)**

PPP is the main pathway for students who wish to work as an engineer upon graduation. They will be prepared for a versatile engineering career through industry attachments and internships, professional development modules, and other practice-related opportunities.

**RESEARCH-FOCUSED PATHWAY (RfP)**

RfP prepares students for a career in research and to pursue graduate research degrees. Students will intern at research institutes or research laboratories, undertake an advanced research-focused final year project, and read a specified number of graduate-level modules. Before the final year, students may also opt to experience independent research under the Undergraduate Research Opportunities Programme (UROP).
INNOVATION & DESIGN-CENTRIC PROGRAMME

As the world becomes increasingly challenged by global warming and complex issues, NUS Engineering has defined a new paradigm in education, the Design-Centric Programme (DCP). Launched in 2009, DCP provides a platform for learning that brings together engineering, form, function, aesthetics, culture and lifestyle. Going forward in 2016, DCP will be enhanced with a dose of innovation and enterprise via the Innovation & Design-Centric Programme (iDCP). iDCP gives students a broader scope to realise and capture value from their ideas. Through the design process, students learn to create solutions from multidisciplinary perspectives, challenge current assumptions of how people interact with products, and critically evaluate the ability of current products and services to serve people’s needs. Students adopt a user-centred approach to understand, visualise and describe users in the context of how people live, work and play. iDCP will take students further by allowing them to explore and plan business start-ups.

For more information, please visit: www.eng.nus.edu.sg/edic/dcp.html

GLOBAL ENGINEERING PROGRAMME

The Global Engineering Programme (GEP) is designed to attract top students to read Engineering at NUS, those who show exceptional potential as Engineer-Leaders of tomorrow. After three years at NUS Engineering supported by a scholarship, they will receive their Bachelor of Engineering (B Eng) in their chosen field, then go on to pursue a postgraduate degree at a top partner university. NUS Engineering will also help source funding from external agencies to fund GEP students for their graduate studies overseas.

For more information, please visit: https://www.eng.nus.edu.sg/undergraduatestudies/special-programmes/global-engineering-programme-gep/
DIVERSE CURRICULUM

NUS Engineering offers a range of engineering programmes:

- Bachelor of Engineering (Biomedical Engineering)
- Bachelor of Engineering (Chemical Engineering)
- Bachelor of Engineering (Civil Engineering)
- Bachelor of Engineering (Computer Engineering)
- Bachelor of Engineering (Electrical Engineering)
- Bachelor of Engineering (Engineering Science)
- Bachelor of Engineering (Environmental Engineering)
- Bachelor of Engineering (Industrial & Systems Engineering)
- Bachelor of Engineering (Materials Science & Engineering)
- Bachelor of Engineering (Mechanical Engineering)

DOUBLE MAJOR PROGRAMMES

You can pursue a second major from another Faculty or School in addition to your engineering major, choosing topics ranging from Management and Management (Technology) to Psychology. A Bachelor of Engineering (B Eng) degree with Honours and a second major can be completed within four years.

DOUBLE DEGREE PROGRAMMES*

- B Eng and B Arts (Economics)
- B Eng and B Business Administration
- B Eng and B Business Administration (Accountancy)
- Double Degree Programme in Materials Science & Engineering; and Physics
- Double Degree Programme with French Grandes Ecoles

*All engineering programmes except the Engineering Science Programme (ESP). However, ESP students can enrol for the Double Degree Programme with French Grandes Ecoles.
We equip engineers with the ability to analyse problems from both engineering and biomedical perspectives. The special challenges of working with living systems and patients in clinical settings demand no less.

The Department of Biomedical Engineering's mission is to provide quality biomedical engineering education by integrating engineering with the biomedical sciences, and to foster new knowledge and achieve leadership in research through the development of novel technologies and innovative applications. We advance scientific discovery, and develop new technologies through leading-edge research and integrated education. By understanding unmet clinical needs and translating our research to the bedside, we improve diagnostics and therapy.

Our graduates can look forward to joining the medical device and biotechnology industries, health care sectors, research institutes, government agencies, and universities. With the cross-disciplinary training, you will also be well equipped to explore careers in other areas, or further your studies in prestigious graduate programmes in a wide range of biomedical science-related disciplines, including medicine.

SPECIALISATION OPTIONS INCLUDE:
> BIOMATERIALS/TISSUE ENGINEERING
> BIOMECHANICS
> BIOMEDICAL ELECTRONICS & IMAGING

REACH US TODAY
✉ biechlh@nus.edu.sg
📞 (65) 6516 3553
🌐 www.bioeng.nus.edu.sg

ご覧ください：
✉ biechlh@nus.edu.sg
📞 (65) 6516 3553
🌐 www.bioeng.nus.edu.sg
The chemical sector is Singapore’s second largest in terms of manufacturing output. With the transformation of Jurong Island into a major petroleum and petrochemical hub, this sector continues to attract new investments.

On the biomolecular front, recent investments in the biopharmaceutical industry and biologics manufacturing capabilities in the Tuas Biomedical Park have significantly boosted the contribution of this sector to the Singapore economy.

In short, the growth potential is amazing.

Our Bachelor of Engineering (Chemical Engineering) programme provides a strong foundation in chemical and biomolecular engineering, giving you every chance to excel in these industries: chemical, petroleum, petrochemicals, pharmaceutical/biomedical sciences, food, energy, life sciences, chemical process design and research.

SPECIALISATION OPTIONS INCLUDE:
> BIOMOLECULAR ENGINEERING
> PROCESS SYSTEMS ENGINEERING

REACH US TODAY
✉️ chbeug@nus.edu.sg
📞 (65) 6516 8076
🌐 www.chbe.nus.edu.sg

Chemical & Biomolecular Engineering fuses engineering with chemical sciences, life sciences and materials science, preparing you for a career in a broad range of growth industries, and to meet challenges in achieving sustainable processes.
Global climate change. Natural hazards. Man-made disasters. Sustainable infrastructure development. Conservation of material, energy and water resources. Civil & Environmental Engineering addresses these grand challenges by bringing together the latest developments in science and technology.

The Department of Civil & Environmental Engineering’s two undergraduate programmes, Bachelor of Engineering (Civil Engineering) and Bachelor of Engineering (Environmental Engineering), emphasise multidisciplinary approaches to solve complex infrastructure and environmental problems. Bringing together flexible and innovative curricula, world-class teaching and research facilities, as well as faculty members that are well-regarded internationally in their respective areas of research expertise, we equip our graduates to stay relevant in a globalised technology-based economy, able to embark on multiple career pathways.

Our students have a solid academic foundation and acquire critical thinking, and problem-solving skills to become high-level specialists working in various sectors of civil and environmental engineering. Imbued with a globalised outlook, our graduates can also opt for careers in multidisciplinary fields, including policy makers, entrepreneurs in engineering, as well as leaders of established multinational companies and various governing authorities.

SPECIALISATION OPTIONS INCLUDE:


ENVIRONMENTAL ENGINEERING > Air Pollution Assessment & Control / Alternative Energy Resources / Climate Change / Environmental Microbiology & Biotechnology / Hazardous & Solid Waste Management / Human & Environmental Health / Water Quality & Treatment / Water Reclamation & Reuse

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✉ ceelcc@nus.edu.sg
📞 (65) 6516 4270
🌐 www.eng.nus.edu.sg/cee/

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Who has generated most of the technologies in the modern world? Who has enabled all your gadgets to work so amazingly? Electrical and computer engineers, of course! We drive innovations.

Electrical & Computer Engineering provides the intelligent technology platforms needed to address global challenges, such as an ageing population, healthcare, mobility and energy sustainability. We offer two undergraduate programmes: Bachelor of Engineering (Electrical Engineering), and Bachelor of Engineering (Computer Engineering). The Computer Engineering programme is jointly hosted by NUS Engineering’s Department of Electrical & Computer Engineering, and the School of Computing’s Department of Computer Science. Both programmes place strong emphasis on understanding engineering principles through exposure to hands-on learning and discovery. They offer a high degree of flexibility in specialisation, supplemented with special programmes that promote design, student innovation, enterprise and leadership, and are supported by faculty members with strong research expertise and laboratory work experience.

Our graduates are sought after across all economic sectors and fields, such as chemical, petroleum, medical, aerospace, construction and financial industries. Some graduates have even distinguished themselves as entrepreneurs.

SPECIALISATION OPTIONS INCLUDE:

**COMPUTER ENGINEERING**
- Communications & Networks
- Embedded Computing
- Large-Scale Computing
- Intelligent Systems
- Interactive Digital Media
- System-on-a-Chip Design

**ELECTRICAL ENGINEERING**
- Communications & Networks
- Control, Intelligent Systems & Robotics
- Integrated Circuits & Embedded Systems
- Microelectronic Technologies & Devices
- Microwave & RF
- Power & Energy Systems
- Signal Analysis & Machine Intelligence

**REACH US TODAY**
- Email: askECE@nus.edu.sg
- Phone: (65) 6516 2109

**www.ece.nus.edu.sg**

**www.ceg.nus.edu.sg**
Jointly offered by NUS Engineering and the Faculty of Science, the Engineering Science Programme provides the scientific and mathematical tools for the fundamental study of engineered systems. Students have the opportunity to engage in nanomaterials and structures, microelectronic devices, transportation systems, energy, as well as chemical and biological systems. You can look forward to becoming a new class of engineer-scientists better prepared to solve multidisciplinary problems of a high-tech world.

Our graduates are valued for their creativity, critical thinking, good teamwork ethics, and great communication skills. Ample employment opportunities are available in traditional engineering, business markets, and emerging technologies, such as nanotechnology, photonics and renewable/sustainable energy technologies. Graduates may also proceed to postgraduate programmes in various science and engineering disciplines, or explore opportunities in academic and industry R&D labs, start-ups, nanotechnology and engineering companies.

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✉️ espsec@nus.edu.sg
📞 (65) 6516 3354
🌐 www.esp.nus.edu.sg

What do you get when you add mathematics, physics, computer science, and biological and chemical sciences to classical engineering studies? You get a whole new and exciting cross-disciplinary field called Engineering Science.
Industrial & Systems Engineering draws concepts from engineering, mathematics, economics, statistics and social sciences to derive efficiency and productivity improvement that is required in today’s increasingly competitive global market.

In meeting the demand for better quality products and services, and an increased pressure to reduce the cost of their delivery, decision-makers need highly rigorous skills to identify, analyse and design complex production systems. The Bachelor of Engineering (Industrial & Systems Engineering) programme equips students with a comprehensive and rigorous set of analytical and management skills required to meet these challenges.

Industrial & Systems Engineering professionals engineer processes and systems and develop innovative solutions to improve quality and productivity, eliminating waste of time, money, materials and energy, as well as create new services. Industrial & Systems Engineering is unique among the engineering disciplines in that its techniques can be applied across a diverse range of industries, not only in manufacturing, but also in logistics and supply chain management, banking and finance, consultancy services, IT, transportation, utilities, entertainment, and health care.

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✉ isebox1@nus.edu.sg
📞 (65) 6516 4100
🌐 www.ise.nus.edu.sg
The Department of Materials Science & Engineering’s interdisciplinary education platform integrates scientific understanding with engineering principles relevant to the design and applications of both conventional and advanced novel materials. We focus on emerging frontiers, such as nanostructured materials and biomedical materials, sustainable energy, infocomm technology and biomedical technology, areas that offer exciting new opportunities, ranging from manufacturing and process to research and development of high-tech materials.

In our laboratories, you will learn the practical aspects of all the branches of Materials Science & Engineering, and will be equipped to embark on multiple career pathways in various industry sectors, including electronics, chemical, petroleum, medical, aerospace and construction. With the cross-disciplinary training, you can also explore careers in other areas, such as research institutes, government agencies and universities, or enrol in prestigious graduate programmes in Materials Science & Engineering or other related topics.

SPECIALISATION OPTIONS INCLUDE:
> NANOSTRUCTURED MATERIALS & NANOTECHNOLOGY
> POLYMERIC & BIOMEDICAL MATERIALS

REACH US TODAY
✉ msebox5@nus.edu.sg
📞 (65) 6516 4672
🌐 www.mse.nus.edu.sg

Materials are all around us, part of our daily life. Materials Science & Engineering provides science-driven and engineering applications-oriented education and research in advanced materials for today’s and tomorrow’s technology needs.
Mechanical Engineering involves the design, manufacture or operation of any product or system that moves and uses or produces energy. As a mechanical engineer, your knowledge and skills will be applied from design right through to product usage. The Bachelor of Engineering (Mechanical Engineering) programme integrates theory with practical learning through design projects with industry partners, solving real-life problems, providing first-hand insights into complete design cycles in commercial enterprises, and linking you to industry even before graduating. You can also be part of the cutting-edge research efforts of faculty members to bring innovative technologies to the world.

The versatility of Mechanical Engineering opens up a wide array of career options, from the traditional aerospace, automotive and manufacturing industries, to robotics, biomedical technology, energy systems and sustainable technology. Our graduates’ creativity, critical thinking and teamwork are also highly valued in non-engineering fields, such as consulting, management, banking and finance.

SPECIALISATION OPTIONS INCLUDE:
> AERONAUTICAL ENGINEERING
> ENERGY & SUSTAINABILITY
> OFFSHORE OIL & GAS TECHNOLOGY

REACH US TODAY
✉ enquire_me@nus.edu.sg
📞 (65) 6516 2212
me.nus.edu.sg

www.facebook.com/NUSMechanicalEngineering
# ADMISSION TO ENGINEERING

Applicants can apply online via the NUS Office of Admissions website: [www.nus.edu.sg/oam/](http://www.nus.edu.sg/oam/)

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<th>B ENG PROGRAMME</th>
<th>DURATION (Years)</th>
<th>REQUIREMENTS FOR ADMISSION</th>
<th>International Baccalaureate (IB)</th>
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<tbody>
<tr>
<td>2. Environmental Engineering</td>
<td>4</td>
<td>&gt; H2 Mathematics, and &gt; H2 Chemistry, and &gt; H2 Physics*</td>
<td>&gt; HL Mathematics, and &gt; HL Chemistry</td>
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<tr>
<td>3. Biomedical Engineering***</td>
<td>4</td>
<td>&gt; H2 Mathematics, and &gt; H2 Physics* or H2 Chemistry</td>
<td>&gt; HL Mathematics, and &gt; HL Physics** or HL Chemistry</td>
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<tr>
<td>4. Civil Engineering</td>
<td>4</td>
<td>&gt; H2 Mathematics, and &gt; H2 Physics or H2 Chemistry</td>
<td>&gt; HL Mathematics, and &gt; HL Physics** or HL Chemistry</td>
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<tr>
<td>5. Computer Engineering</td>
<td>4</td>
<td>&gt; H2 Mathematics, and &gt; H2 Physics</td>
<td>&gt; HL Mathematics, and &gt; HL Physics</td>
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<tr>
<td>7. Industrial &amp; Systems Engineering</td>
<td>4</td>
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<tr>
<td>8. Materials Science &amp; Engineering</td>
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<tr>
<td>9. Mechanical Engineering</td>
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Double Degree in:
1. Engineering & Business Administration+
2. Engineering & Business Administration (Accountancy)+
3. Engineering & Economics+
4. Engineering (Materials Science & Engineering) & Physics

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<tr>
<th>Double Degree Programme</th>
<th>DURATION (Years)</th>
<th>REQUIREMENTS FOR ADMISSION</th>
<th>International Baccalaureate (IB)</th>
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<tbody>
<tr>
<td>2. Engineering &amp; Business Administration (Accountancy)+</td>
<td>4½ – 5½</td>
<td>Students may apply for pre-admission in Semester One in the first year in their respective faculties. Admission will be granted after satisfactory performance in the first year.</td>
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+ These Double Degree Programmes are open to Engineering students from these fields: Biomedical, Chemical, Civil, Computer, Electrical, Environmental, Industrial & Systems, Materials Science and Mechanical.

* Students without H2 or H1 Physics need to have ‘O’ level Physics or equivalent and will be required to take specified Physics bridging modules.

** Students without HL Physics would be required to take Physics bridging modules.

*** Students without an H2 pass in Chemistry will have to read the Chemistry Bridging Module (CM1417) in the first year.

> Applicants (regardless of nationality) presenting an acceptable Diploma from a Polytechnic in Singapore may also apply. Please visit [www.nus.edu.sg/oam/apply-to-nus/Poly-admissions-req-to-NUS.html](http://www.nus.edu.sg/oam/apply-to-nus/Poly-admissions-req-to-NUS.html) for more details.

> International applicants with international qualifications can apply using equivalent high school results.

> Singaporeans with international qualifications can apply using equivalent high school results.