“Engineering has been an integral part of my life as I search for ways to improve. The 4 years of engineering education have been an enriching experience. I have not only matured intellectually but also developed valuable life skills. I have certainly enjoyed the analytical processes in tackling situations. My time in Engineering Science Programme has allowed me to appreciate the essence of an engineering discipline - to deliver simple yet creative solutions.

The opportunities from the internships, networking sessions and participation in engineering/business competitions are beyond my expectations. I also participated in the NUS Overseas College for two semesters to sharpen my business acumen. NUS Engineering is still the choice discipline I am proud of.”

Tan Jian Hao
The Faculty of Engineering is the largest faculty in the University with over 6,000 undergraduates and 2,900 graduate students. It has been consistently ranked among the top universities in Engineering and Technology by The Times Higher Education Supplement in the UK since 2004. Our mission is to nurture engineer leaders by providing an education that brings out the full potential and talents of students and equipping them with the knowledge and skills to deliver innovative solutions to complex multidisciplinary problems.

Many of the challenges faced by the world today such as climate change, clean energy and ageing-related health issues require creative engineering solutions that integrate knowledge from multiple disciplines.

**International accreditation, world standing**

The Faculty of Engineering provides a number of flexible and innovative alternative learning pathways. The newest of these are the Design-Centric Curriculum (DCC) and the Global Engineering Programme (GEP). The Design-Centric Curriculum places a strong emphasis on cross-disciplinary and problem based learning while the Global Engineering Programme provides an enhanced global learning experience, culminating in the opportunity to undertake graduate studies at a top overseas university in the fourth year of study.

Through our Faculty’s partnerships with industry and leading overseas institutions, our engineering students are ensured exposure to international best practices. As a testimony to the excellent standards of our undergraduate programmes, our degrees are accredited by the Engineering Accreditation Board (EAB) of Singapore, which is a signatory of the Washington Accord. This means that our engineering graduates are recognised as having met the academic requirements for engineering practice in the other countries that are also signatories, including Australia, Canada, Hong Kong, Japan, New Zealand, UK and USA.
The Design-Centric Curriculum

Design-Centric Curriculum (DCC) is a flexible and innovative alternative learning pathway for engineering students uniquely offered by the NUS Faculty of Engineering. It complements the many options available to NUS engineering students. DCC aims to produce engineering graduates with a global perspective yet who are sensitive to local cultural subtleties, and who have the ability to identify and solve complex challenges of societal importance.

A key feature of the DCC is the multi-year, multi-disciplinary projects which address complex and coupled problems within the three broad themes of Engineering in Medicine, Future Transportation Systems and Smart and Sustainable Cities. DCC students will spend 3 years (in the specialist pathway) or 3.5 years (in the general pathway) working together on these projects in teams comprising students from different engineering disciplines. They will be guided by teams of mentors with diverse background.

The other features of the DCC include generic DCC modules, specially-tailored enrichment programmes, and a learning environment that encourages creativity, team learning and collaboration/cooperation across disciplinary boundaries. DCC students will also take a number of modules which will be taught the DCC way, i.e. they will learn the contents of these modules in the context of their DCC projects.

Currently, DCC students could opt for one of the two pathways available: the general pathway and the specialist pathway. In the general pathway, students begin with the identification and formulation of problems through the full cycle of empathy, definition, ideation, prototyping, and testing (the Design Thinking Cycle), leading to a clear roadmap for their respective projects. Employing engineering principles they have learned, DCC students work on these problems starting at the component level and moving with increasing complexity till an integrated engineering solution is obtained. In the specialist pathway, students work on problems within certain topical engineering grand challenges. They will still go through the Design Thinking Cycle but will ideate within the predefined challenges to offer engineering solutions.

The Global Engineering Programme

Started in August 2009, the Global Engineering Programme (GEP) is an exclusive programme designed for students with exceptionally high potential. It provides an enhanced and flexible education with close mentoring that incorporates a global learning experience.

The programme will lead to the award of two degrees – a Bachelor of Engineering (B.Eng.) at NUS within three years (fulfilling all the MCs required as for normal stream students) and for those who qualify for admission to a top university, a postgraduate degree in Engineering in their fourth year. Scholarships will be provided for a student’s undergraduate studies.

Students will enjoy small group learning with close supervision and mentoring by a select pool of Faculty staff. GEP students will ride on an accelerated track, with opportunities to gain advanced placement credits, resulting in exemptions from specific modules, as well as to take self-study modules. In addition, students can pursue a summer programme and are expected to spend at least one semester overseas on a student exchange programme (SEP). Specially-tailored Undergraduate Research Opportunity Programme (UROP) projects at NUS or a GEP partner university will provide early research exposure.

BACHELOR OF ENGINEERING (BIOENGINEERING)
www.bioeng.nus.edu.sg

Bioengineering is a fusion between engineering and the life sciences. The mission of the Bioengineering Division is to create and impart engineering knowledge in the basic and applied biosciences, and in healthcare applications. Our aim is to endow students with the fundamental knowledge, expertise and skills they will need to become leaders in their chosen field. Graduates in Bioengineering should be able to analyse a problem from both engineering and biological perspectives, anticipate the special difficulties in working with living systems and evaluate a wider range of possible approaches to solutions. They can look forward to joining the biomedical device and biotechnology industries, hospitals, research institutes, government agencies and universities.

They may choose to further their studies in a graduate programme in medicine or other biomedical engineering related topics or to explore careers in other areas of interest.
Computer Engineering (CEG) is a joint programme offered by the Department of Electrical and Computer Engineering at the Faculty of Engineering and the Department of Computer Science at the School of Computing. This programme exploits new synergies and strengths of the two departments within NUS. The aim is to produce graduates with a good foundation to work in the critical layer of technology that interfaces hardware with software. In particular, graduates will be able to attain significant knowledge and abilities in key technologies for real-time embedded systems, computer networking & wireless communication systems, medical imaging & information systems, intelligent control systems, and many others. In the workplace, computer engineers span a wide range of skills such as the development of portable multimedia devices and handphones, creating novel security/cryptographic systems for protecting images, music, games development, design of human machine interface and many other computer related hardware/software products. CEG students have the opportunity to pursue research in embedded systems, computer and communications networks, electronic gaming, algorithm development, artificial intelligence, biomedical computing and others.

Civil engineers are creators of wealth as their projects stimulate growth for other sectors of the economy. With increased expectations for a higher quality of life, civil engineers are needed to plan and design increasingly complex projects. They also improve infrastructure for sustainable development such as structures that can withstand natural and man-made disasters. Civil engineers can also specialise in offshore and marine engineering. Currently, unprecedented growth is being experienced in the design and fabrication of offshore rigs, semi-submersibles and structures with facilities and equipment for the oil and gas industry.

The Department of Civil & Environmental Engineering plays a critical role in transforming students with a good background in physics and mathematics to graduates with a strong competence in structural engineering, hydrodynamics, geotechnical and transportation engineering. We train engineer-leaders with strong fundamentals in civil and environmental engineering complemented with a knowledge in management, economics and law.

In a rapidly evolving technological world, electrical engineering (EE) plays an important role in the creation of new ideas, products and solutions. At the Electrical & Computer Engineering (ECE) Department, we provide a nurturing environment which prepares students for a career in industry, business or research. EE graduates will have strong foundations in the fundamental concepts and analytical tools of contemporary electrical engineering including electronics circuit design, signal processing, signals, systems and control, microprocessor systems and physics of semiconductor devices.

With their solid foundation, they are amongst the most versatile graduates who will be able to take on diverse careers. Students who are keen in research will have opportunities to work in areas as diverse as nanotechnology, biomedical engineering, interactive digital media, games, intelligent systems, energy systems, renewal energies, robotics, communications and integrated circuit design.
BACHELOR OF ENGINEERING (ENVIRONMENTAL ENGINEERING)
www.eng.nus.edu.sg/cee

Environmental Engineering is an exciting and rewarding field. The programme encourages a multidisciplinary approach to solving complex environmental problems, and equips students with a sound scientific knowledge combined with advanced engineering capabilities for their understanding of global environmental issues.

The Department of Civil & Environmental Engineering promotes unique research and educational opportunities in all aspects of air, land, and water systems including water quality and treatment, wastewater reclamation and reuse, air pollution assessment and treatment, aerosol science and technology, management of terrestrial and coastal resources, separation science and technologies, human and environmental health, industrial ecology, climate change, renewable energy, and the broader environmental sciences. Students will have opportunities to develop pilot and full-scale test facilities and are encouraged to work with postgraduate students and faculty members to gain “hands-on experience” in the research and development of new technologies.

BACHELOR OF ENGINEERING (INDUSTRIAL & SYSTEMS ENGINEERING)
www.isc.nus.edu.sg

Industrial & Systems Engineering (ISE) emphasises efficiency and productivity improvement and is derived from a combination of engineering, mathematics, economics, statistics and the social sciences. It provides decision makers with the ability to identify, analyse and design complex production systems to resolve real world problems in the manufacturing, logistics, defence and service industries. For example, IC fabrication plants, airlines, banks, telecommunication, military operations and management consultancies require ISE engineers.

As Singapore transforms into a knowledge-based economy and upgrades its industries, there will be greater demand for ISE engineers to improve efficiency and productivity.

With a strong foundation in quantitative fundamentals and a broad exposure to applications in various industries ranging from manufacturing to services, ISE graduates will be well equipped to facilitate decision making and improve efficiency and productivity in these industries. The versatility of ISE graduates make them well demanded in the global economy of today.

BACHELOR OF ENGINEERING (ENGINEERING SCIENCE)
www.esp.nus.edu.sg

In an increasingly competitive global economy, engineers equipped with integrated science and engineering skills for multidisciplinary R&D positions are critical in the next phase of Singapore’s growth. Engineering Science, a fusion of basic sciences, mathematics and engineering, is designed to produce engineer-scientists who are better prepared to solve multidisciplinary problems, develop innovative designs and integrate systems at the interfaces of engineering and science. In the first two years of study, students build a strong foundation in engineering and science by taking a set of core modules. Design projects are also injected into the curriculum to provide integrative learning and hands-on experience in the application of the fundamentals learnt. In the final two years, students can pursue their interests in Nanoscience and Nanotechnology, Computational Engineering Science, Photonics & Optics or Energy Systems. Engineering Science graduates will have a strong scientific background for leadership roles in R&D, government and civilian jobs.

Winner of 2011 Formula-Society of Automotive Engineers Chief Design Judge Award (1st in Engineering Design Drawing) at the FSAE Intervarsity Competition in Michigan International Speedway, USA in May 2011.
The students from the Dept of Civil and Environmental Engineering swept all the three major awards in the APEC-IDEERS EARTHQUAKE CHALLENGE 2011, Taiwan.

BACHELOR OF ENGINEERING (MATERIALS SCIENCE & ENGINEERING)
www.mse.nus.edu.sg

Materials Science and Engineering is a dynamic, interdisciplinary study that combines the fundamental sciences (Chemistry, Physics and Life Sciences) with applied engineering (Electronics, Mechanical, Chemical and Bioengineering). It strives for a basic understanding of how the science of material structures and processes at the atomic scale results in the properties and functions familiar at the engineering level. One aspect involves studying and designing materials to make them useful and reliable.

The department focuses on emerging new frontiers such as nano-structured materials and biomedical materials in sustainable energy, infocom technology and biotechnology. These areas offer exciting opportunities in the research of high-tech materials, which are of economic importance to Singapore. Students will get hands-on experience using state-of-the-art equipment and facilities in the laboratories. This will ensure MSE graduates are well-equipped with sufficient practical knowledge and experience. The department also offers two certified specialisations of Polymeric and Biomedical Materials and Nanostructured Materials/Nanotechnology.

BACHELOR OF ENGINEERING (MECHANICAL ENGINEERING)
www.me.nus.edu.sg

Mechanical engineers are involved in the research, development and design of a diverse range of products. Hence, the programme aims to equip students with key engineering knowledge and skills which are fundamental to their onward progression to more complex and specialised applications. Students can then choose from one of the following specialisations:

- Aeronautical Engineering
- Automotive Engineering
- Biomechanical Engineering
- Energy & Thermal Process Engineering
- Materials Engineering in Design
- Mechatronics
- Micro-Systems Technology
- Offshore Oil & Gas Technology
- Precision Engineering
- Product Design

Practical design is also an integral part of the programme. Industry tie-ups enable students to work on design projects sponsored by companies, giving students an insight into design cycles in commercial enterprises. The prospects for mechanical engineers also remain bright as high-technology industries will continue to be a key engine of growth for the country.

BACHELOR OF TECHNOLOGY (PART-TIME)
https://btech.eng.nus.edu.sg

The Programme is specially designed for polytechnic graduates, or those with equivalent qualifications, working in the local industry. It provides an affordable route for studying towards a high-quality engineering degree while gaining valuable working experience and earning an income.

All classes are conducted in the evenings on weekdays and Saturday afternoons. Degrees are fully accredited by the relevant engineering bodies, by the Engineering Council of the UK to the M.Eng level and by the Engineering Accreditation Board of Singapore.

Courses leading to the B.Tech degrees in Chemical, Electronics, Industrial & Management, Manufacturing and Mechanical Engineering are offered. The modular curriculum structure allows students the greatest flexibility to plan their study and achieve a good work, family and study balance.

Students can choose to complete their degree in a minimum of 3.5 years or up to a maximum of 8 years. Eligible Singaporeans and Singapore Permanent Residents enjoy subsidies of 55% and 20% of the tuition fees, respectively.
<table>
<thead>
<tr>
<th>Course</th>
<th>Majors</th>
<th>Subject Prerequisites</th>
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<tbody>
<tr>
<td>Bachelor of Engineering in Chemical Engineering (Honours)</td>
<td>Thermodynamics, transport phenomena, reactor systems, separation processes, process design, safety and control</td>
<td>H2 Mathematics, and H2 Chemistry, and H2 Physics1</td>
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<tr>
<td>Bachelor of Engineering in Environmental Engineering (Honours)</td>
<td>Air and water pollution abatement, industrial safety and health, solid waste management and environmental management</td>
<td>H2 Mathematics, and H2 Physics1 or H2 Chemistry</td>
</tr>
<tr>
<td>Bachelor of Engineering in Bioengineering (Honours)</td>
<td>Bioimaging and biosignal processing, biomechanics and computational modelling, nanobioengineering &amp; nanobiotechnology, and biomaterials/tissue engineering &amp; repair</td>
<td>H2 Mathematics, and H2 Physics1 or H2 Chemistry</td>
</tr>
<tr>
<td>Bachelor of Engineering in Civil Engineering (Honours)</td>
<td>Civil engineering materials, construction management, environmental engineering, geotechnical engineering, hydraulic engineering, infrastructure systems, structural engineering and transport engineering</td>
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<tr>
<td>Bachelor of Engineering in Computer Engineering (Honours)</td>
<td>Software engineering, embedded computing, computer communications networks, digital and wireless communications, intelligent control and systems, advanced digital design, multimedia signal processing, interactive digital media</td>
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<tr>
<td>Bachelor of Engineering in Electrical Engineering (Honours)</td>
<td>Advanced control, advanced electronics, biomedical engineering, cellular mobile communications, magnetic recording systems, multimedia communications, microwave and RF systems, mechatronics and automation, multimedia signal processing, optoelectronics, power electronics and drives, energy systems and VLSI design and manufacturing</td>
<td></td>
</tr>
<tr>
<td>Bachelor of Engineering in Industrial and Systems Engineering (Honours)</td>
<td>Operations research, systems design and optimisation, integration of complex systems, supply chain modelling, quality engineering and management, human factors engineering</td>
<td></td>
</tr>
<tr>
<td>Bachelor of Engineering in Materials Science and Engineering (Honours)</td>
<td>Process engineering and quality control, R&amp;D in various industries, materials related research in Research Institutes, nanotechnology and nano-materials, materials in batteries and fuel-cells, special metals and composites in aerospace industries</td>
<td></td>
</tr>
<tr>
<td>Bachelor of Engineering in Mechanical Engineering (Honours)</td>
<td>Aeronautical engineering, automotive engineering, biomechanical engineering, energy &amp; thermal process engineering, materials engineering for design, mechatronics, micro-systems technology, offshore oil &amp; gas technology, precision engineering, product design</td>
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<td>Course</td>
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<tr>
<td>Bachelor of Engineering in Engineering Science</td>
<td>Nanoscience and nanotechnology, computational engineering science, photonics and optics, energy systems</td>
<td>Good grades in H2 Mathematics, and H2 Physics</td>
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<tr>
<td>(Honours)</td>
<td></td>
<td>Good grades in HL Mathematics, and HL Physics</td>
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<td></td>
<td></td>
<td>Major CAP of 2.0 in Mathematics, and Physics</td>
</tr>
<tr>
<td>Double Degree Programmes</td>
<td></td>
<td>Two routes of admission: direct admission by students with 'A' Level entry requirement for both courses, or application by students in B.Eng. or BBA/ Economics Programme at end of their first year of study</td>
</tr>
<tr>
<td>Bachelor of Engineering (Honours)/Bachelor of Social Science (Honours) in Economics</td>
<td></td>
<td>Two routes of admission: direct admission by students with IB entry requirements for both courses, or application by students in B.Eng. or BBA/ Economics Programme at end of their first year of study</td>
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<tr>
<td>Bachelor of Engineering (Honours)/Bachelor of Business Administration (Honours)</td>
<td></td>
<td>Students may apply for pre-admission in Semester One of Year One in their respective faculties; Admission into the programme after satisfactory performance in their first year</td>
</tr>
<tr>
<td>Bachelor of Engineering (Honours)/Bachelor of Business Administration (Accountancy) (Honours/non-Honours)</td>
<td></td>
<td>Students may apply for pre-admission in Semester One of Year One in their respective faculties; Admission into the programme after satisfactory performance in their first year</td>
</tr>
<tr>
<td>Bachelor of Engineering in Materials Science and Engineering (Honours)/Bachelor of Science in Physics (Honours)</td>
<td></td>
<td>Students may apply for pre-admission in Semester One of Year One in their respective faculties; Admission into the programme after satisfactory performance in their first year</td>
</tr>
</tbody>
</table>

1. Students without H1 or H2 Physics need to have an ‘O’ level pass in Physics or its equivalent and would be required to take Physics bridging modules.
2. Students without HL Physics or a Physics major would be required to take Physics bridging modules.
3. Students without a H2 pass in Chemistry or a Chemistry major or its equivalent must read the Chemistry bridging module (CM1417) in the first year.
4. These Double Degree Programmes are open to engineering students from these fields: Bioengineering, Chemical, Civil, Computer, Electrical, Environmental, Industrial & Systems, Materials Science; and Mechanical.

For a single-degree course, the course duration is typically 4 years. For a double-degree course, it takes at least 4.5 years.
Course Accreditations and Career Prospects

Why Engineering@NUS Is The Choice:

- A global university ranked among the world’s best in the field of Engineering & Technology.
- A global engineering school where students are nurtured by some of the best engineering minds in the world.
- Academic diversity and flexible broad-based education, which enables students to pursue their educational objectives such as being equipped for cutting-edge multidisciplinary research or becoming more business savvy through a second degree in Business.
- Highly accredited and well recognised engineering degree programmes with a design-centric approach.
- Learning environment with a global outlook and opportunities to develop managerial, entrepreneurial and leadership qualities.
- Cutting-edge R&D and state-of-the-art laboratories.

<table>
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<tr>
<th>DISCIPLINES</th>
<th>INDUSTRIES (CAREER OPPORTUNITIES)</th>
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<tbody>
<tr>
<td>Bioengineering</td>
<td>Biomedical devices, hospitals and medical centers, biomedical science/life sciences and biotechnology companies, research institutes and statutory boards</td>
</tr>
<tr>
<td>Chemical Engineering</td>
<td>Chemical, oil &amp; gas, petroleum, petrochemical, plastics/polymers, food, pharmaceutical/biomedical science, electronics/semiconductors, engineering consultancy, research institutes and government/statutory boards</td>
</tr>
<tr>
<td>Civil Engineering</td>
<td>Engineering consulting firms, R&amp;D institutions, construction and offshore engineering, environmental engineering and transport industries</td>
</tr>
<tr>
<td>Computer Engineering</td>
<td>Digital and wireless communications, embedded computing, intelligent systems, Internet, multimedia, creative arts and software companies</td>
</tr>
<tr>
<td>Electrical Engineering</td>
<td>Digital and wireless communications, computers and peripherals, control and automation, electronics, Internet, energy systems management, semiconductor, wafer fabrication and manufacturing, avionics, engineering consultancy, transportation management, etc.</td>
</tr>
</tbody>
</table>
| Engineering Science     | Academic, government organisations and private companies in:  
  • Semiconductor & microelectronics  
  • Data storage & media  
  • Scientific instrumentation  
  • Chemicals & pharmaceuticals  
  • Computational, design and consultancy  
  • Renewable energy  
  • Analytical microscopy  
  • Biomedical imaging  
  • Start-up nanotechnology, clean energy & other hi-tech companies                                                                                                                                                                                                                                        |
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<td>Environmental Engineering</td>
<td>Petroleum, petrochemical and chemical process industries, safety, health, environmental consulting industries, research and utilities</td>
</tr>
<tr>
<td>Industrial &amp; Systems Engineering</td>
<td>Manufacturing, logistics and supply chains, airlines, banking /management consultancy, telecommunication and utilities, defence, leisure</td>
</tr>
<tr>
<td>Materials Science &amp; Engineering</td>
<td>Semiconductor, information storage, pharmaceutical and chemical industries, aerospace and defence industries, metals, ceramics, polymers, composites and special materials</td>
</tr>
<tr>
<td>Mechanical Engineering</td>
<td>Aerospace, automotive, biomedical, control and automation, engineering consultancy, manufacturing, materials processing, mechanical engineering services, oil and gas, power generation, semiconductor, thermal environment</td>
</tr>
</tbody>
</table>