Jointly hosted and supported by the faculties of Engineering and Science, the Engineering Science Programme (ESP) is an NUS initiative in STEM education, where real world relevant engineering and technological education is grounded in solid scientific and mathematical foundations.

The programme is hosted by the Mechanical Engineering, Electrical and Computer Engineering, and Physics departments. Students will gain strong fundamentals in physics and mathematics, and apply them to real world engineering applications that involve nano-science and technology, energy systems, computational engineering, and medical systems. ESP is a programme that seeks to give students confidence in hands-on experimentation coupled with scientific rigour. This programme is suitable for students who want a career in R&D, whether it be in industry or academia.
There is a variety of different possible careers for graduates of the Engineering Science Programme. Past students have gone on to find jobs in all sectors of industry, government agencies, and have set up their own start-up companies. The specialisations in the Engineering Science Programme naturally link up with post-graduate opportunities in the departments of Mechanical Engineering, Electrical & Computer Engineering, and Physics. These departments are constantly developing the Engineering Science Programme, fine-tuning its curriculum and developing its specialisations so that the programme provides career opportunities.

Some of the more common career prospects for our graduates are in the following:

- **Nanoscience and Technology**: Applied Materials, KLA, Merck, Micron, SIMTech
- **Computational Engineering Science**: DSO, Micron Semiconductor Asia Pte Ltd, Strategic Infocomm & Technologies
- **Energy Science and Technology**: Schlumberger, Schneider Electric, SIA Engineering
- **Engineering Science in Medicine**: Advanced medical analytical instrumentation companies such as Bruker, Zeiss and Shimadzu.

There are many engineering challenges for the future, such as finding sustainable clean forms of energy, developing safe global forms of communication and transport, and creating smart cities. These challenges require engineers to be more adaptable, versatile, and multi-disciplinary. The Engineering Science Programme at NUS was created to prepare students for these kinds of challenges. Its programme is designed to give students confidence in hands-on experimentation, so that they can gain skills in a variety of different disciplines, such as electronics, mechanics and computing. This is done through many design projects, small enough and individualised so students have the opportunity to develop their own solutions. At the same time, students will take advanced level courses in mathematics and physics, which gives them the scientific foundation to carry out multi-disciplinary research and development, and find innovative solutions to challenging engineering problems.

**Energy Science and Technology**

Addressing renewable and non-renewable energy sources is of crucial concern today. Understanding the production, conversion, storage and management of various forms of energy is important to achieve efficiency and maintain urban sustainability.

**Computational Engineering Science**

This specialisation focuses on the creation of predictive mathematical models and simulations through the use of mathematics, physics and mechanics. These methods are widely used in the visualisation and computation of complex scientific and engineering problems.

**Engineering Science in Medicine**

Be future engineers and scientists in healthcare and medical instrumentation from small diagnostic sensor systems, to large-scale technologies such as focused ion beam rings in cancer therapy.
Choosing NUS Engineering Science Programme was a wise decision. The rigour of the curriculum, the exposure to different streams of information, and the multiple opportunities that the programme offered, allowed me to grow holistically and challenged me to go beyond my comfort zone. Having a close-knit class throughout the four years was definitely a great plus point, as it gave me comfort and reassurance when the going got tough. I owe my success today to my knowledgeable professors, caring staff and a bunch of wonderful classmates.

Gwee Chia Hong, Class of 2016
Assistant Director, Energy Division,
Ministry of Trade and Industry

ADMISSIONS REQUIREMENTS

Both Singapore-Cambridge A-level Mathematics and Physics are mandatory for this programme, and priority will be given to candidates who have at least a B grade in both. Chemistry is recommended, but not mandatory. Those without A-level Chemistry (or equivalent) will have to do a Chemistry bridging course in their first year.