ENGINEERING

AEROSPACE ENGINEERING
AUTOMATION & MECHATRONIC SYSTEMS
BIOMEDICAL ENGINEERING
COMMON ENGINEERING PROGRAMME
ELECTRICAL ENGINEERING
ELECTRONIC & COMPUTER ENGINEERING
ENGINEERING SCIENCE
MARINE & OFFSHORE TECHNOLOGY
MECHANICAL ENGINEERING
ENGINEERING WITH THAT SOMETHING XTRA!

School of ENGINEERING

9 Common Engineering Programme [N71]
12 Engineering Science [N93]
16 Aerospace Engineering (N65) REVAMPED
20 Automation & Mechatronic Systems [N50]
24 Biomedical Engineering (N60)
27 Electrical Engineering (N43) REVAMPED
31 Electronic & Computer Engineering (N44)
34 Marine & Offshore Technology [N42]
37 Mechanical Engineering [N41]
From industry induction to mentorship, future city programme to overseas exposure, you’ll find engineering with that something xtra at Ngee Ann Polytechnic’s School of Engineering (SoE)!
At SoE, there are as many as 8 engineering diplomas for you to pick from, depending on your interest or aptitude.

Engineering Science (ES)
Get a strong foundation in engineering and related domains such as mathematics, physics, applied science and research.

Aerospace Engineering (AEG)
The only aerospace diploma that allows you to choose between the Avionics and Mechanical specialisation options, two engineering disciplines in the aerospace industry.

Automation & Mechatronic Systems (AMS)
A well-designed curriculum that combines mechanics, electronics and programming to engineer smart machines such as autonomous vehicles, robots and smart devices.

Biomedical Engineering (BME)
The only poly diploma that bridges engineering and life sciences.

Electrical Engineering (EE)
A broad-based course that prepares you for careers in diverse sectors ranging from clean energy, power engineering, transportation to practising licensed electrical work.

Electronic & Computer Engineering (ECE)
A solid diploma that gives you a strong foundation in electronic hardware design, software programming skills and computer networks.

Marine & Offshore Technology (MOT)
A unique course that covers both naval architecture and offshore engineering.

Mechanical Engineering (ME)
A broad-based curriculum that prepares you for the future economy in precision engineering and manufacturing, facilities and infrastructure; environment and energy; and transportation.

Common Engineering Programme (CEP)
But if you are still not sure which engineering discipline best suits you, fret not. The special Common Engineering Programme (CEP) will help you gain a better understanding of the different disciplines before you make your choice. You’ll be able to choose your preferred engineering diploma from either the Mechanical Track or the Electrical & Electronic Track at the end of your first semester. Find out more about CEP on Page 9.
SKILLSFUTURE INITIATIVES

Enhanced Internships
You can look forward to longer and more structured internships, as NP continues to collaborate with industry partners to provide more effective on-the-job training. Enhanced internships have been rolled out for most courses. Part of the national SkillsFuture Initiative, this programme allows you to better apply the skills you have learnt in the classroom to the workplace.

SkillsFuture Work-Study Post-Diploma Programme
You can join the SkillsFuture Work-Study Post-Diploma Programme to get a head start in your career. A work-study programme, you will be matched with a company and undergo structured on-the-job training, and obtain an industry-recognised certification, such as the Specialist Diploma in Electrical Design and Operation, as well as the Specialist Diploma in Marine Production from NP. There is also the Start-up Talent Factory programme for fresh poly graduates who are keen to do a 9 to 12-month stint at a start-up.

SkillsFuture Series
NP also offers several courses under the SkillsFuture Series in these emerging skills areas: Entrepreneurship, Advanced Manufacturing, Tech-enabled Services and Data Analytics.
BEYOND THE CLASSROOM

At SoE, there are many exciting opportunities to inspire your passion for learning and innovating. Our strong industry links also ensure that you pick up relevant industry skills and are exposed to emerging technologies.

But don’t take our word for it – check out what our students have done and where they’ve been! With the broad-based curriculum that SoE offers, you can expect limitless possibilities and a journey with that something xtra.

Future City Programme
Shape the Singapore of tomorrow through this unique programme! You will get exposed to or be involved in future city projects through mentorships, learning journeys and internships.

Scan the QR code to find out more about the Future City Programme!

Service-Learning
Design and develop engineering solutions that benefit society and make classroom learning more purposeful. For example, students worked with Lions Befrienders to create the NP RoboCoach, which assists elderly in keeping fit.
Overseas Exposure
Go on overseas trips that deepen your skill sets.

University Research
Work with professors from NUS, NTU and SUTD on real-world projects in areas like artificial intelligence and photonics.

Induction Programmes
Participate in induction programmes which include industry visits and talks that give you a sneak peek at the wide spectrum of careers in the field of engineering.

Internship
Gain valuable real-world experience through internships.

Integrated Real-World Project
Work on an integrated project, where you will develop solutions for real-world problems using design-thinking methods.
The Math and Science Whiz

Vhora Shrayans Suresh
Mechanical Engineering graduate, Class of 2016

A strong interest in physics and math, coupled with inspiration from the movie The Aviator and the keenness to study how machines were made, propelled Shrayans to take up the Mechanical Engineering course in NP. While in NP, he served as the President of Rangers, a selected group of student ambassadors from SoE. He also credits his great memories in NP to his encouraging supervisors. Shrayans is pursuing Mechanical Engineering at NTU and aims to work in the field before coming back to NP as a lecturer.

The Young Researcher

Zenas Lim
Engineering Science graduate, Class of 2015

Zenas’ passion for research deepened when he worked with experts at A*STAR’s Data Storage Institute on his final-year project. His team’s project eventually won the top prize in NP under the Polytechnic Student Research Programme in 2015. As the most outstanding NP graduate of his cohort, Zenas was awarded the Ngee Ann Kongsi Gold Medal. He also clinched the Lee Kuan Yew Award. He is currently pursuing a direct Masters in Electronic and Information Engineering at Imperial College London.

With That Something XTRA
The Renaissance Engineer
Pavatharani Senthil Kumar
Aerospace Technology* graduate, Class of 2016

From young, Pavatharani has always wanted to be a pilot and was curious how aircraft worked. In fact, tinkering with toys by taking them apart and fixing them afterward was something that came naturally to her. Undeterred by gender norms, she aspires to be one of the rare female leaders in the aerospace industry and intends to make the industry more eco-friendly. She is currently in the prestigious Renaissance Engineering Programme at Nanyang Technological University, under the Renaissance Engineering Programme Scholarship.

The Tech Entrepreneur
Jasper Yap
Aerospace Technology* graduate, Class of 2017

Jasper picked up programming skills on his own while working part-time in a maid agency, where he created a system that enabled customers to complete the paperwork process in five minutes instead of the usual hour. Word got out and his skills became so sought after that at least five other companies contacted him to create similar systems for them. In 2016, he co-founded Yosei Labs, a web design agency which has since been acquired by EeZee, a Business-to-Business procurement company with over 150 suppliers on its platform.

*The diploma has been renamed as Aerospace Engineering since AY2019.
The Biomedical Engineer

Tey Ming Chuan
Biomedical Engineering graduate, Class of 2018

Ming Chuan decided to pursue the Biomedical Engineering course in NP as he wanted to explore the seemingly limitless possibilities in integrating biology and engineering.

His opportunity came in his final year when he undertook a project in collaboration with the National University Hospital. Ming Chuan and his team mate worked on a new innovation to aid in administering liquid food to patients with swallowing difficulties. Instead of tapping on traditional x-rays to trace the internal placement of the feeding tube, the project utilises air pressure from an electromechanical pneumatic system which is a safer, simpler and cheaper method.

The project took six months, as well as numerous hospital visits for collecting feedback, to come to pass. The team's efforts were recognised, as the project received a Merit Prize at the Tan Kah Kee Young Inventors’ Award and a Bronze Award [Polytechnic Category] at the Biomedical Engineering Society's 11th Scientific Meeting.

Looking ahead, Ming Chuan hopes to use his technical skills and knowledge to develop a new innovation that can benefit the community in future.

The Engineer & Doctor

Anne Foo
Engineering Science graduate, Class of 2018

At NP, Anne had the opportunity to work on several research projects, including an award-winning one where she developed an algorithm for the detection of coronary artery disease. This project made her realise how she could use her skills to make people’s lives better and the possibility of pursuing a career as a doctor in the future.

Anne has had her dream realised as she has been accepted in the new SUTD-Duke-NUS Special Track, a degree programme jointly offered by the Singapore University of Technology and Design and Duke-NUS Medical School. The interdisciplinary programme aims to prepare students with a background in engineering for leadership roles in healthcare as clinicians who can treat patients and develop medical innovations.
N93 DIPLOMA IN ENGINEERING SCIENCE

- A taste of university life with applied R&D projects at NTU, NUS and SUTD
- Overseas study visits and early R&D exposure at top-notch universities in Singapore, Japan and China as well as renowned research institutes such as A*STAR
WHAT THE COURSE IS ABOUT

You’re passionate about engineering applications, but also love the sciences. You’re strong in both math and physics. You’re also keen to explore scientific research and discover new ways to solve real-world problems. You don’t have to settle on a compromise – how about honing all these interests through the Diploma in Engineering Science (ES)?

With a curriculum designed in collaboration with Nanyang Technological University (NTU), ES prepares you well for a wide range of careers and degrees in engineering fields such as artificial intelligence and machine learning, computer, electrical, electronic and mechanical as well as material science.

During the first two years, you will be equipped with a strong foundation in engineering and related domains such as mathematics, physics, applied science and research. You will attend distinguished guest lectures and go on industry visits. You may also be exposed to short stints with research establishments and institutes such as NUS and A*STAR.

In your second year, you may also get to visit top overseas universities such as Tokyo Metropolitan University (Japan), Tokyo Metropolitan College of Industrial Technology (Japan) or Nanjing University of Science & Technology (China). There, you will interact with students and professors, and be exposed to the latest developments in technology and innovation.

In the third year, you will be exposed to the skills and knowledge in emerging technologies in artificial intelligence and machine learning, and embark on a final-year project or R&D-oriented internship.

You may have the opportunity to be attached to Nanyang Technological University (NTU), National University of Singapore (NUS), Singapore University of Technology & Design (SUTD) or a research institute, where you will be involved in projects supervised by university professors and researchers. There might also be opportunities to work on a R&D-oriented internship with local startups and multinational companies, as well as an overseas internship. These projects and internships will cover a wide range of topics such as artificial intelligence, automotive vehicles, additive manufacturing, Internet of Things (IoT), robotics, biomedical engineering, green energy and material science.

If you’re looking for an Engineering diploma that attracts the brightest minds, look no further!

18% ES students received the NP Scholarship and Merit Award in 2018
9 ES students received external scholarships (e.g. A*STAR Science Award (Poly), DSO Diploma Scholarship, Singtel Engineering Cadet Scholarship) in 2018, which provides R&D internship opportunities
80% ES graduates offered admission in prestigious local and overseas universities
/ WHAT YOU WILL LEARN /

YEAR 1
- AC Circuits
- Analogue Electronics
- Applied Mathematics 1 & 2
- Digital Fundamentals
- Electrical Engineering Fundamentals
- Mechanical Engineering Fundamentals
- Programming
- Integrated Real-World Project 1 & 2
- Health & Wellness*
- Innovation Made Possible*
- Communication Essentials For Engineers*
- English Language Express**

Off-campus Exposure
Your exposure to engineering will be broadened with visits and short stints at multinational companies (MNCs) and renowned research institutes such as A*STAR and NUS Research.

YEAR 2
- Physics 1 & 2
- Data Structures & Algorithms
- Embedded System
- Object-Oriented Programming
- Thermofluids
- Materials & Manufacturing Technology
- Integrated Real-World Project 3 & 4
- World Issues: A Singapore Perspective*

Off-campus Exposure
You will expand your horizons with study visits to top overseas universities and institutions such as Tokyo Metropolitan University (Japan), Tokyo Metropolitan College of Industrial Technology (Japan) or Nanjing University of Science & Technology (China).

YEAR 3
- Circuit Analysis & Design
- Artificial Intelligence & Machine Learning
- System Modelling & Control
- Integrated Real-World Project 5
- Final-Year Project or Internship (Local/Overseas)
- Project ID: Connecting the Dots*

Off-campus Exposure
You may get to work on applied R&D projects in NTU, NUS, SUTD or research institutes. Alternatively, you might get internship opportunities in multinational or startup companies (local or overseas).

* Interdisciplinary Studies (IS) modules account for up to 15 credit units of the diploma curriculum. They include modules in communication, innovation and world issues, as well as an interdisciplinary project. By bringing students from diverse diplomas together, the interdisciplinary project fosters collaboration to explore and propose solutions for real-world problems. IS aims to develop students to be agile and self-directed learners, ready for the future workplace.

** For selected students only.

To keep our curriculum current and robust, diploma modules are subject to change over the three years. Please visit our website for latest updates.
/ CAREER /
Armed with an ES diploma, you will enjoy good career prospects in areas such as research & development, product design and development, and manufacturing and services.

/ FURTHER STUDIES /
Both NTU and NUS have accredited ES for a wide range of their degree programmes. In addition, SUTD offers course/module exemptions for ES graduates who have met the criteria in their Compact Courses. With your strong foundation as an ES graduate, you can also apply for a wide range of degree programmes offered by overseas universities. For example, overseas universities that offer degrees in engineering science include:

- University of Toronto (Canada)
- Oxford University (UK)
- University of California, Berkeley (USA)
- Osaka University (Japan)
- University of Hong Kong (China)

About 80 per cent of our graduates were offered admission to various local and overseas universities.

/ ENTRY REQUIREMENTS /
AGGREGATE TYPE ELR2B2-C
To be eligible for consideration, candidates must have the following GCE ‘O’ Level examination (or equivalent) results.

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<tr>
<th>SUBJECT</th>
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<tbody>
<tr>
<td>English Language</td>
<td>1-7</td>
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<tr>
<td>Mathematics (Elementary/Additional)</td>
<td>1-6</td>
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<tr>
<td>Science (with Physics, Chemistry or Biology component)</td>
<td>1-6</td>
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<tr>
<td>Biotechnology</td>
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<td>Computing/Computer Studies</td>
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<td>Design &amp; Technology</td>
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<td>Electronics/Fundamentals of Electronics</td>
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<td>Engineering Science</td>
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<td>Physical Science</td>
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You must also fulfill the aggregate computation requirements for the ELR2B2-C Aggregate Type listed at www.np.edu.sg/admissions/Documents/ELR2B2.pdf

For students with other qualifications, please refer to the NP website for the entry requirements and admissions exercise period.

Candidates with hearing deficiency or severe vision deficiency should not apply for the course. Those with colour vision deficiency may be considered, subject to an in-house test.

CONTACT US
For the most up-to-date information on NP’s Diploma in Engineering Science and its modules, log on to www.np.edu.sg/es

A Brainy Solution
ES graduates Sunny Despande and S. Suren developed a system that allows clinicians to accurately diagnose epileptic seizures during brain signal screenings. The Brainwave Screening system has an accuracy rate of up to 83 per cent, based on the project’s database and samples of 7500 brainwave signals.