SCHOOL OF
ENGINEERING

› AEROSPACE ENGINEERING
› AUTOMATION & MECHATRONIC SYSTEMS
› BIOMEDICAL ENGINEERING
› COMMON ENGINEERING PROGRAMME
› ELECTRICAL ENGINEERING
› ELECTRONIC & COMPUTER ENGINEERING
› ENGINEERING SCIENCE
› MARINE & OFFSHORE TECHNOLOGY
› MECHANICAL ENGINEERING
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.
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.
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.
N50 DIPLOMA IN AUTOMATION & MECHATRONIC SYSTEMS

- A broad-based curriculum that enables you to combine mechanics, electronics and programming to engineer smart machines such as autonomous vehicles and robots
- Strong focus on emerging trends & skills in Advanced Robotics & Automation, Data Analytics, Internet of Things (IoT) and Design Thinking for the new Digital Industry
- Get prepared for exciting careers in the precision engineering, electronics, aerospace and marine & offshore engineering sectors
Imagine stepping out of your smart home, taking a self-driving vehicle to your favourite restaurant, and getting served by a robotic waitress. The field of automation is steadily growing and finding its way into every home, company and industry. If you want to engineer the next generation of smart machines, the Diploma in Automation & Mechatronic Systems (AMS) is your ideal choice.

AMS prepares students for exciting careers in diverse sectors ranging from precision engineering, aerospace, electronics, energy and chemical, food manufacturing, marine & offshore and sea transport. You will learn to use emerging skills in robotics and automation, design thinking, Internet of Things (IoT) and data analytics to develop high-tech solutions for consumer products and industrial applications.

What’s more, AMS’s emphasis on project-based learning, design thinking and experiential learning will give you an edge in developing applications of industrial robots, autonomous vehicles, modular production systems and smart sensor technology.

In the first two years, you will build a strong foundation in the various disciplines of engineering - electrical, electronics, mechanical and programming. You will also learn practical skills in Computer-Aided Design and development of control software for smart devices and automated lines.

In your third year, you will learn how to control industrial robots and build an autonomous vehicle. You will also go on a six-month internship with companies such as ST Land Systems, PSA Singapore, Keppel Offshore & Marine and A*STAR. Or you can choose to work on a final-year project to design and develop a high-tech product prototype.

You will also get to work on an Integrated Real-world Project in every semester. These projects will develop your critical thinking, problem-solving and technical skills.

During my internship with Rolls-Royce Singapore, I was part of the research team that played a pivotal role in helping Rolls-Royce to improve the efficiency and performance of its manufacturing processes. I worked on developing virtual commissioning solutions that help automate processes of surface modification technologies. I was excited to be able to apply my skills in the workplace.

JAVIER TEO
AMS GRADUATE, CLASS OF 2018
WHAT YOU WILL LEARN

YEAR 1
- Electrical Engineering Fundamentals
- Electrical & Electronics Technology
- Engineering Mathematics 1 & 2
- Integrated Real-world Project 1 & 2
- Materials & Manufacturing Technology
- Mechanical Engineering Fundamentals
- Programming
- Thermofluids
- Health & Wellness*
- Innovation Made Possible*
- Communication Essentials For Engineers*
- English Language Express**

YEAR 2
- Applied Mechanics
- Computer-Aided Design & Drafting
- Engineering System Design
- Industrial Automation
- Integrated Real-world Project 3 & 4
- Microcontroller & System
- Network Fundamentals
- Quality Systems & Analytics
- Strength of Materials
- World Issues: A Singapore Perspective*

YEAR 3
- Industrial Robot System & Application
- Integrated Real-world Project 5
- Sensor & Drive Systems
- System Modelling & Control
- Six-month Internship or Final-Year Project
- Project ID: Connecting the Dots*

* Interdisciplinary Studies (IS) modules account for up to 13 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.

One Step Ahead
Meet the unbeatable DoodleBot - an industrial robot that loves playing Tic-Tac-Toe with you! This smart system is a product of several automation technologies combined, including robotics, computer vision, image processing and control algorithm programming! Using its simple web-camera, the Doodlebot can locate the square grids and circles drawn by you, analyse the game and counter your moves!
As a designer and engineer of automation systems, you will be well-sought after in jobs that involve the design, development and manufacturing of “intelligent” products and systems. Examples of some industries where you can pursue such careers include precision engineering, electronics, chemicals and petrochemicals, aerospace, marine & offshore, and information and communication. You can also find jobs related to process development, process automation, port automation, engineering tests as well as the maintenance and operation of high-tech equipment and facilities.

The AMS course is a broad-based course and caters to various SkillsFuture sectors: Precision Engineering, Aerospace, Electronics, Energy and Chemical, Food Manufacturing, Marine & Offshore Engineering and Sea Transport.

You can deepen your skills through SkillsFuture Work-Study Post-Diploma Programmes, such as the Specialist Diploma in Aircraft Maintenance and Engineering and Specialist Diploma in Marine Production respectively.

You will be well prepared for further studies in mechanical, electrical or electronic engineering at both local and overseas universities. You may even be granted advanced standing in related engineering courses at:

- Nanyang Technological University
  - Bachelor of Engineering in Computer Science, Computer Engineering, Electrical & Electronic Engineering, Information Engineering and Media, Mechanical Engineering or Materials Engineering
- National University of Singapore
  - Bachelor of Engineering in Computer, Electrical or Mechanical Engineering
- University of Manchester (UK)
  - Bachelor of Engineering in Mechatronic Engineering
- University of Sheffield (UK)
  - Bachelor of Engineering in Mechatronic and Robotic Engineering or Systems & Control Engineering
- University of New South Wales [Australia]
  - Bachelor of Engineering in Mechatronic Engineering
- Monash University [Australia]
  - Bachelor of Engineering in Mechatronic Engineering or IT & Systems
- Singapore Institute of Technology-University of Glasgow
  - Bachelor of Engineering with Honours in Mechanical Engineering

To be eligible for consideration, candidates must have the following GCE ‘O’ Level examination (or equivalent) results.

<table>
<thead>
<tr>
<th>SUBJECT</th>
<th>‘O’ LEVEL GRADE</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</td>
<td>1-6</td>
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<td>(with Physics, Chemistry or Biology component)</td>
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<td>or Biotechnology</td>
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<td>or Computing/Computer Studies</td>
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<td>or Design &amp; Technology</td>
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<td>or Electronics/Fundamentals of Electronics</td>
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<td>or Engineering Science</td>
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<td>or Physical Science</td>
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You must also fulfil 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.

Related Courses
- Aerospace Engineering
- Common Engineering Programme
- Electrical Engineering
- Electronic & Computer Engineering
- Engineering Science

For the most up-to-date information on NP’s Diploma in Automation & Mechatronic Systems and its modules, log on to www.np.edu.sg/ams