



SCHOOL OF ENGINEERING

The School of Engineering (SoE) is the largest academic school in Ngee Ann Polytechnic. It offers a total of 17 diplomas under the following clusters:

- Special Course/Programme
- Aerospace
- Biomedical
- Design, Media & Infocomm
- Electrical, Electronics & Computer
- Environment & Energy
- Marine, Mechanical & Mechatronics
- Property

Each cluster offers diploma courses in the respective discipline areas with specialised teaching expertise and learning facilities. Our diplomas are infused with multidisciplinary elements to nurture well-rounded graduates who are highly valued and sought-after by the industry and universities.

The Special Course/Programme includes the Diploma in Engineering Science, which prepares students with a strong passion for applied science for university, and the Engineering with Business Management Programme, which is jointly offered by SoE and the School of Business & Accountancy.

ENGINEERING WITH BUSINESS MANAGEMENT PROGRAMME

Students who are **interested in both engineering and business studies can have the best of both worlds** when they enrol in the Engineering with Business Management Programme (EBM).

Traditionally, students who wish to pursue an engineering diploma have to choose a specific engineering discipline during the application process. However, with EBM, students can choose their preferred engineering discipline towards the end of their first semester in Year 1. This allows them to gain a better understanding of the various disciplines before making a more informed decision.

Besides enjoying this flexibility, EBM students will also **learn business management modules delivered by the School of Business & Accountancy**. The broader curriculum is geared towards training students to be new age engineers with the vision for business leadership.

Under this EBM programme, students will have a choice of nine diplomas to graduate in:

- Aerospace Electronics
- Aerospace Technology
- Audio-visual Technology
- Automation & Mechatronic Systems
- Biomedical Engineering
- Electrical Engineering
- Electronic & Computer Engineering
- Marine & Offshore Technology
- Mechanical Engineering

All first-year students taking the above engineering courses, including those who opt for EBM, will share a common curriculum in the first semester. Towards the end of the first semester, EBM freshmen will choose their preferred engineering courses.

COURSES OFFERED

SoE offers a total of 17 full-time diploma courses, grouped by clusters. These clusters are also related to several other courses. Please see table below.

Cluster	Courses	Other Related Courses
Special Programme / Course	Engineering Science (ES) Engineering with Business Management Programme (EBM)	
Aerospace	Aerospace Electronics (AE) Aerospace Technology (AT)	AMS, EE, ECE, ME, EBM
Biomedical	Biomedical Engineering (BME)	AMS, ECE, ME, EBM
Design, Media & Infocomm	Audio-visual Technology (AVT) Network Systems & Security (NSS) Product Design & Innovation (PDI)	EBM
Electrical, Electronics & Computer	Electrical Engineering (EE) Electronic & Computer Engineering (ECE)	AE, AVT, BME, EBM, ES
Environment & Energy	Clean Energy Management (CEM) Environmental & Water Technology (EWT) Sustainable Urban Design & Engineering (SDE)	EE, ME
Marine, Mechanical & Mechatronics	Automation & Mechatronic Systems (AMS) Marine & Offshore Technology (MOT) Mechanical Engineering (ME)	AT, ECE, EE, EBM, ES
Property	Hotel & Leisure Facilities Management (HLFM) Real Estate Business (REB)	SDE, EE, ME

An important aspect of Ngee Ann's engineering diplomas is the option for graduating students to participate in either an internship or an in-house Project Design & Development (PDD) module. Internships give our students invaluable experiential learning by giving them the opportunity to apply the knowledge and

skills they have gained in the classroom in real-world settings. This will better prepare them for their future careers. The PDD module offers intensive learning projects that require significant planning and implementation effort. It places emphasis on developing projects that lead to useful solutions for industry.



DIPLOMA PLUS PROGRAMMES

The Diploma Plus Programme (DPP) is designed to provide students with proficiency in a selected domain area, either to broaden or deepen a student's knowledge/skills in his/her main discipline of study, or to equip a student with additional professional knowledge that would better prepare him/her for further study or increase their employability.

SoE students can select elective modules from a wide range of clusters to obtain their Diploma Plus Certificate. The DPP clusters offered by SoE are:

- Aerospace Design
- Aerospace Electronics
- Applied Physics
- Aviation Fundamentals
- Biomedical Engineering
- Computer-Aided Design Skills
- Computer & Communication Systems
- Electrical Control & Measurement
- Environmental Innovations
- Industrial Control
- Leisure & Retail Management
- Mechanical Technology
- Mechatronics Application Skills
- Microelectronics
- Network Systems & Security
- Robotics
- Stage Management & Technology
- Workplace Safety & Health

For the description of the modules within each elective cluster, please refer to page 180. For details on the specific clusters available to different diplomas, please refer to the Course Modules section of each diploma under the Diploma Plus Programme.

SoE students can also pursue Diploma Plus Certificates in Advanced Engineering Mathematics, Business, Innovation Management, and Foreign Languages, which are offered by other academic schools in Ngee Ann.

MAJOR ACHIEVEMENTS

Two teams of students from the Mechanical Engineering diploma course took home the gold in their respective categories in the 2011 Shell Eco-Marathon Asia, which attracted more than 90 teams from Asian educational institutions. The teams won in the Prototype Hydrogen and UrbanConcept Plug-in Electricity categories.

Second-year Environmental & Water Technology student, Low Zhan Hong received the Bayer Young Environmental Envoy Award for his dedication in promoting and organising a community recycling project. Zhan Hong was one of four Bayer Young Environmental Envoys from Singapore who joined youth delegates from across four continents on a week-long, all-expenses paid study trip to Germany.

A team of two Electrical Engineering students came in second in the Tertiary Category of the 2011 Green Wave Environment Competition. Since the first prize was not awarded, the team merged top of their category, beating all other tertiary teams in Singapore.

Network Systems & Security graduate Koh Lin Xin is pursuing a Master's Degree in Information Systems Engineering in Imperial College London under the iDA's National Infocomm Scholarship. This scholarship covers all his fees and expenses.

FACILITIES & STAFF

SoE students can look forward to a conducive and engaging learning environment. Depending on the course of study, students will get the opportunity to work in one or more technology and expertise area such as:

- Aerospace
- Automation, Control & Instrumentation
- Audio-Visual
- Automotive Technology and Motor Sports
- Bioengineering
- Design & Rapid Prototyping
- Digital Audio & Video Broadcast
- Electronics
- Energy Systems
- Environment and Water
- Green Building
- IT & Networking
- Marine & Offshore
- Micro-electromechanical Systems
- Photonics & Lasers
- Product & Industrial Design
- Real Estate Market Research
- Robotics
- Solar Energy
- Sustainable Design & Development
- Wafer Fabrication
- Wind Technology
- Wireless Communication Systems

Students can expect to be involved in developing projects and applying state-of-the-art technologies. This is made possible by a pool of highly qualified and dedicated lecturers and technical support staff who hold relevant post-graduate degrees and industry working experience in their respective engineering fields.

SoE strongly promotes, amongst its staff, the culture of continuous learning and collaborations with local and overseas partners so as to continuously keep abreast of the latest technological developments. For example, SoE lecturers often work with their counterparts from local and overseas research and educational institutions to publish books, craft articles for journals and present papers at conferences. In doing so, we ensure that our curricula remain up-to-date and relevant.

To support our staff and students' quest for excellence in technology capability development, SoE is equipped with some of the latest facilities, such as:

- Aerospace Hub
- Alpha Centre (for Robotics)
- Assistive Technology Centre
- Automation & Integrated System Centre
- Biomedical Engineering Centre
- Bluetooth Laboratory
- Design & Rapid Prototyping Centre
- Digital Signal Processing Centre
- Energy & Environment Centre
- Facilities Management Centre
- Frontline | AeroScout - Enterprise Visibility Solution Centre
- High Voltage Training Centre
- Instrumentation & Control Centre
- Internetworking Technology Laboratory
- Marine Technology Laboratory
- Microelectronics Design & Application Laboratory
- Photonics Laboratory
- Power Quality Centre
- Radio Frequency Laboratory
- Solar Technology Centre
- Wind Technology Training Centre

COLLABORATIONS

SoE has forged numerous collaborations with various partners including educational institutions such as the National University of Singapore and Nanyang Technological University as well as overseas universities in the UK, Japan, Australia, China, South Korea and Malaysia.

SoE also boasts industry partners such as SingTel, SIA Engineering, Eurocopter SEA, Keppel Corporation, Sembcorp Industries, Singapore Technologies Engineering, Tan Tock Seng Hospital, Cisco Systems, National Instruments and IBM, as well as government agencies such as BCA, HDB, PUB and NPARKS. These partnerships provide opportunities for SoE staff and students to engage in joint research and consultancy projects, skills and technology transfer, training, and internships.

Here are four examples of collaborations that have enriched the learning experience of our students. The School recently signed a Memorandum of Understanding with the HDB which allows our students to participate in research and development work in the areas of Cultivation of Mangroves along Punggol Waterway, Development of Floating Wetlands System for the Tropics and Storm Water Management. Thirty students from the Clean Energy Management course enjoyed the valuable learning experience of installing a solar-powered lighting system in a house at Pulau Ubin as a part of a collaboration with Narada Asia Pacific Pte Ltd.

Staff and students from the Biomedical Engineering course may also enjoy the opportunity of participating in research and development in the area of using infrared imaging techniques to diagnose dry eyes as part of a collaborative project with the Singapore Eye Research Institute and NTU. Lastly, 15 Aerospace Technology students visited Aviation Australia in Brisbane to participate in a practical training programme as part of an agreement between the company and NP.