



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 seven clusters listed below. SoE, together with the School of Business & Accountancy, also offers the Engineering with Business Management Programme. What's more, come 2011, the School will be offering a new Diploma in Engineering Science which prepares students with a strong passion for applied science for university.

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

Each cluster offers diploma courses on respective areas of discipline 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.

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 into the Engineering with Business Management (EBM) programme.

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 to train 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 and 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 the EBM programme, will share a common curriculum in the first semester. Towards the end of the first semester, the EBM freshmen will choose their preferred engineering courses while other SoE freshmen may choose to study business management modules.

COURSES OFFERED

With the new Diploma in Engineering Science (ES), SoE now 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.

An important aspect of Ngee Ann's Engineering courses is the option for graduating students to participate in either a six-month Internship or an in-house Project Design & Development (PDD) programme. Internships provide our students with experiential training and facilitate their passage into working life. They solve real-life industrial issues encountered by our industry partners. PDD emphasises on applied research projects leading to useful solutions for industry.

DIPLOMA PLUS PROGRAMME

The Diploma Plus Programme (DPP) is designed to provide students with adequate 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
- Computing Methodology
- Electrical Control & Measurement
- Environmental Innovations

- Industrial Control
- Industrial Electronics
- Information Technology
- Leisure & Retail Management
- Mechanical Technology
- Mechatronics Application Skills
- Microelectronics
- Network Systems & Security
- Robotics
- Stage Management & Technology
- Workplace Safety & Health

For the description of individual modules within each elective cluster, please refer to page 176. 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, Economics and Financial Applications, Innovation & Enterprise, and Foreign Languages, which are offered by other academic schools in Ngee Ann.

Areas of Interest	Courses	Other Related Courses
Special Programme / Course	Engineering Science (ES) [NEW] 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

MAJOR ACHIEVEMENTS

A group of final-year Diploma in Environmental & Water Technology students were awarded a Merit Award for presenting a paper at the Seminar on Earth Control Measures, organised by the Institution of Engineers, Singapore in May 2010. The paper "Optimum silt trap at construction sites" presented the findings from a final-year project, which was initiated by the Land Transport Authority, Safety Division and in collaboration with Ngee Ann Polytechnic under the Polytechnic Student Research Programme.

A team of students from the Mechanical Engineering diploma course designed and built an attractive and fuel-efficient car powered by environmental friendly fuel cell technology. The eco-car took part in the Shell Eco-marathon Asia 2010, at Sepang, Kuala Lumpur, Malaysia, in July 2010, and won the First Runner-Up prize for the Fuel Cell Prototype category.

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

- Wireless Communication Systems

Students can expect to be involved in projects developing and applying state-of-the-art technologies. This is made possible by a pool of highly qualified and dedicated lecturers and technical support staff with 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. 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 and 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 and 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.

Academic Collaborations

- **MOU between Ngee Ann Polytechnic, F1 in Schools Ltd c/o Denford Ltd and F1 in Schools Pte Ltd**

A Memorandum of Understanding (MoU) was signed between Ngee Ann Polytechnic, F1 in Schools Ltd c/o Denford Ltd and F1 in Schools Pte Ltd to organise the F1 in Schools – 2010 World Championship in Ngee Ann Polytechnic in September 2010.

- **MOU between Ngee Ann Polytechnic and the Faculty of Chemical and Natural Resources Engineering of Universiti Teknologi Malaysia (UTM) in Skudai**

A Memorandum of Understanding (MoU) was signed between Ngee Ann Polytechnic and the Faculty of Chemical and Natural Resources Engineering of Universiti Teknologi Malaysia (UTM) in Skudai, to pave the way for academic collaboration and facilitation of industrial visits and attachment for staff and internship for our MOT students in the area of oil and gas training.

- **Collaboration and Software Usage Agreement between National Instruments and Ngee Ann Polytechnic**

The Collaboration and Software Usage Agreement was signed between National Instruments (NI) and Ngee Ann Polytechnic. Under this agreement, NI has extended free usage of 350 licenses of Academic License Software Suite. This is worth more than \$6 million, which is the equivalent market price of these software licenses sold to academic institutions.

- **Agreement between Port & Logistics College of Tongmyong University, Busan South Korea and Ngee Ann Polytechnic**

An agreement was signed between Port & Logistics College of Tongmyong University, Busan South Korea and Ngee Ann Polytechnic to encourage and facilitate academic collaboration and education exchange.

- **MOU between Eurocopter SEA Pte Ltd and Ngee Ann Polytechnic**

A Memorandum of Understanding (MoU) was signed between Eurocopter South East Asia Pte Ltd and Ngee Ann Polytechnic to further cooperate, promote and develop links in the field of helicopter maintenance education and training.

- **Bachelor of Engineering in Naval Architecture with Honours**

Offered since September 2008, this specialised two-year degree programme is the product of a partnership between Ngee Ann Polytechnic, Singapore Polytechnic and Newcastle University in the UK. It was formed under the Ministry of Education's Polytechnic-Foreign Specialised Institution (Poly-FSI) initiative.

This specialised degree programme offers graduates of NP's Diploma in Marine & Offshore Technology and SP's Diploma in Marine Engineering a seamless progression to a prestigious overseas degree course without having to leave Singapore. There is also provision for students to undergo a four-week immersion at Newcastle University.

Technical Collaborations

Some of the School of Engineering's technical collaborations with industry partners and institutions in 2010 include:

- A collaboration with Techno Fibre (S) Pte Ltd to develop applications for breakthrough technologies in the "Automation of Marine Vehicles and Systems". SoE also hopes to explore arrangements to conduct technical training programmes in composite materials for the industry.

- A project with AustRehab Pty Ltd (Australia) to investigate the technology viability of "Treadmill Rehabilitation for Stroke Survivors". This project is now seeking further funding from MOE's Innovation Fund.

- Tri-national technical collaboration between researchers from Chiba University in Japan, Shanghai Jiaotong University in China, and A*Star Institute for Infocomm Research in Singapore. This is under a funding from the quasi-govt Japan Society for the Promotion of Science (JSPS).

- A project on analysis of eye abnormalities using infra red images with Medical & Surgical Retinal Centre, Department of Ophthalmology of National University Hospital of Singapore.

- A project with Singapore General Hospital on "Automated Identification of Diabetes Type 2 with and without Neuropathy using Plantar Pressure."

- A joint research project "An Assessment of the Constructed Wetland at Sengkang Riverside Park" with the National Parks Board and Public Utilities Board to monitor and analyse the water quality and plant growth at Sengkang Riverside Park.

PUBLICATIONS

- Dr Ho Siong Lin, Prof Xie Min and Prof Goh Thong Ngee wrote the book Statistical Literacy for Industry & Business (Volume 1).
- Dr Qu Weijun, Ms Chee Oi Choo, Professor Yingjie Yu, Ms Lee Hooi Leng, Professor Tian Ailing, and Professor Anand Asundi from Nanyang Technological University have published a paper entitled Characterization and Inspection of Micro-lens Array by SCBS Microscope.
- E Y K Ng, Rajendra Acharya U and Jasjit Suri wrote a book entitled Performance Evaluation Techniques in Multimodality Breast Cancer Screening, Diagnosis and Treatment.

- NP Lecturer Wu Shucheng worked with Ms Leong Wen Shing, Mr Tay Chor Yong, Mr Yu Haiyang, Mr Li Ang and Professor Tan Lay Poh of the Nanyang Technological University to present a paper entitled Thickness sensing of hMSCs on collagen gel directs stem cell fate at the Biochemical and Biophysical Research Communications.