



School of Engineering

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This School is the place Where the Future Happens — where opportunities are provided for you to realise your ambitions. Always at the forefront of technology, we emphasise innovation, creativity, a practical approach to solving problems, and hands-on training.

We offer 13 exciting diploma courses and 3 special programmes — all of which provide you with a broad-based curriculum that opens the doors to flexible career opportunities in Singapore's new knowledge-based economy. The electives/options/specialisations offered in our courses were carefully selected based on the latest industry trends, and they have been blended into the respective core diploma curriculum. This ensures that you are well prepared to start working in the industry, while giving you a strong foundation for university studies.

Centres of Excellence

With the most up-to-date facilities and equipment, coupled with highly effective teaching methods, the School of Engineering is in the position to ensure that you get a wholesome education that prepares you to meet future economic challenges.

Our strength lies in our ability to be forward-looking to ensure that we remain at the cutting edge of technology. We have six Centres of Excellence which undertake R&D work in collaboration with the industry, so as to further our expertise in specialised technological areas. These Centres help to enhance the professional and academic capability of our staff and students.

Biomedical Engineering Research Centre

This interdisciplinary research centre provides a platform for clinicians, chemists, biochemists, electrical and electronic engineers, mechanical and mechatronics engineers, software engineers and industrial designers to interact and invent cost-effective medical devices and solutions. It currently focuses on the development of an automated wearable peritoneal dialysis device for treating end-stage renal disease (ESRD) patients. The Centre also aims to provide the Medical Technology (MedTech) industry with the technological know-how for commercialisation as well as the expertise in biomedical regulatory compliance.

Clean Energy Research Centre

This is the leading research centre in Singapore providing clean energy solutions for sustainable urban living. The Centre focuses on clean energy generation, energy storage, and efficient power management and distribution for a variety of industrial applications such as portable power, electric vehicles and distributed generation. The Centre has full design and fabrication capabilities in fuel cells and power electronics, as well as state-of-the-art equipment for conducting applied and industry-relevant R&D. Today, the Centre is a preferred partner for developing cutting-edge technologies and is also a specialist training centre for the emerging renewable energy industry. Our partners include major industry players Toyota Tsusho and ST Engineering.

Interactive Digital Centre Asia (IDC Asia)

IDC Asia provides creative and innovative 3D solutions for the Interactive Digital Media (IDM) landscape in Singapore and the Asia-Pacific region. The Centre undertakes use-inspired applied research in emerging fields of 3D media technologies, specifically in primary areas such as interactive glasses-free 3D display technology and 2D-to-3D digital content conversion, to create strategic value innovations for the industry. Set up in November 2007, the Centre's key role is to help various industry sectors such as engineering, architecture, transportation, media and education, to adopt value-added IDM solutions so as to gain a competitive advantage in their businesses. The Centre's partners are key industry players and leading research institutes.

Microelectronics Centre

Microelectronics is at the core of the modern industry and has penetrated into almost every aspect of modern living. This Centre continuously updates and aligns capabilities in micro and nano standards while focusing on the main areas of micro-fabrication, solar cell, solid state lighting, sensors, and nanofabrication, which combine the top-down (etching) and bottom-up (self-assembly) strategies. This Centre has the capability to produce bulk silicon solar cells in small volume, with development efforts in thin film solar cell technology, dye-sensitised solar cell technology, and printing (organic and inorganic) solar cell technology. In solid state lighting, the focus is on quality substrate, novel process in device fabrication, optical design and heat management in packaging, with emphasis on lighting application. In the field of sensors, the Centre focuses on the mechanisms of converting non-electrical quantity into electronic signal, with primary emphasis on biochemical reaction in biosensors.

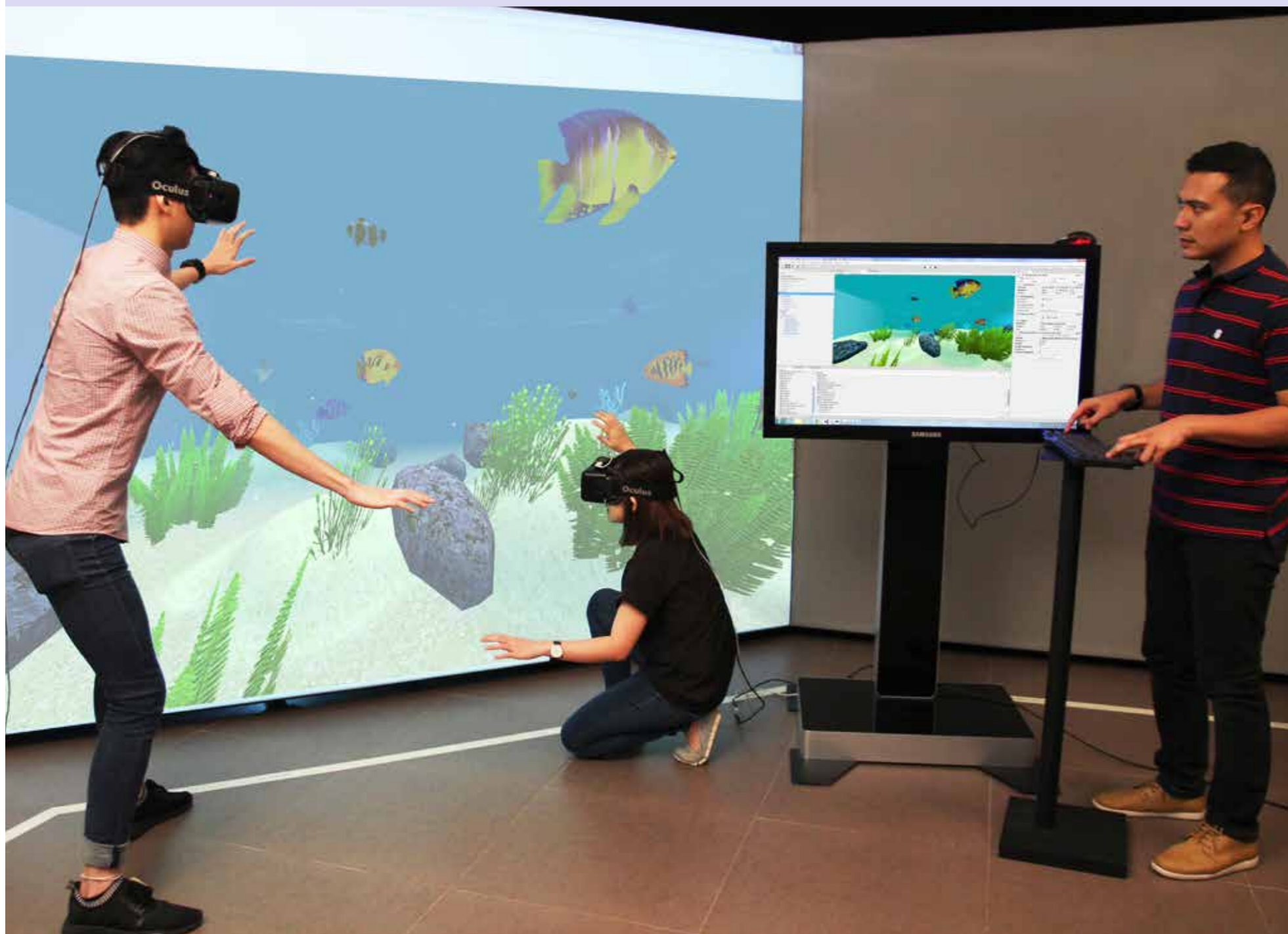
Robotics & Automation Centre

This Centre strives to foster, develop and promote the latest technologies through innovation, applied research, capability development and application in robotics and automation that are relevant to the industry's needs. The core technological areas include wireless sensor network, embedded intelligent system, robotic navigation, path planning, obstacle navigation, motion control for research robots, programmable/motion control for automation, machine vision, process control and simulation.

Temasek Aviation Academy

The Temasek Aviation Academy (TAA) is the latest exciting addition to the School of Engineering. With the completion of the new 6,000 sqm Academy, our campus now has the largest dedicated aviation/aerospace training facility in Singapore. The TAA has specialised training labs for Airport & Airline Operations, Air Traffic Control, Pilot and Licensed Aircraft Engineer Training, and boasts of the latest state-of-the-art aerospace and aviation training equipment including full-flight simulators for training pilots (a first in a local polytechnic), an aircraft hangar with a Hawker Siddeley 700A private jet, a closed-loop wind tunnel and a Virtual Reality experience studio.

3D Interactive Media Technology



You must have come across 3D animation, graphics or simulation used in educational materials, advertising, websites, presentations, computer games, and of course, in movies. These are all interactive digital media – the growth of which is becoming virtually unstoppable today.

Under Singapore's Media 21 plan, the government aims to transform the country into a global media city that develops and trains professionals in such 3D interactive applications. This very exciting course will enable you to tap into this growing market for Interactive Digital Media (IDM) as more companies start to deploy state-of-the-art technology to create 3D graphics to market their products or to design and simulate real-life effects in virtual training for maintenance and manufacturing.

Companies in the aerospace, medical and automotive industries, as well as defence weapon manufacturers and architectural design firms are using such 3D applications to conceptualise futuristic devices that do not exist currently. Schools and educational institutions are also using 3D modelling and animation tools to teach and illustrate complex concepts. In this course, you will be equipped with a solid foundation in not just engineering, but also digital media design concepts, and interactive 3D visualisation and simulation for the IDM industry.



This is a unique course which combines engineering with 3D Interactive Digital Media (IDM) technologies. It shapes a new breed of graduates to meet the expected strong demand for such skills and know-how in the key sectors of Singapore's economy such as engineering, healthcare and transportation.

Vincent Ong
Managing Director,
IM Innovations Pte Ltd
Managing Director,
MAXON Competence Centre

Career Opportunities

You will be able to find excellent employment opportunities in the IDM sector, involving 3D application development, 3D content creation, as well as 3D modelling and animation. Singapore has been tapping into the tremendous potential of IDM to enhance its competitive edge, and this will continue to create many new and exciting job opportunities for you. The multi-agency IDM Programme Office (IDMPO), hosted by Media Development Authority (MDA), has been set up to coordinate the effort among various government agencies to establish Singapore as a digital media hub in the region. You can choose to be involved in front-line sales and marketing, or be a 3D content-developer or trainer in the exciting IDM industry.

Graduation Requirements

Cumulative Grade Point Average	: min 1.0
TP Core Subjects	: 19 credit units
Diploma Core Subjects	: 102 credit units
Cross-Disciplinary Subjects	: min 9 credit units
Total Credit Units Completed	: min 130 credit units

Course Structure

TP CORE SUBJECTS				
SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS	
ECS1003	Writing & Oral Presentation	1	2	
ECS1004	Introduction to Effective Communication	1	2	
LEA1001	Leadership: Essential Attributes & Practice 1	1	1	
LEA1002	Leadership: Essential Attributes & Practice 2	1	1	
LEA1003	Leadership: Essential Attributes & Practice 3	1	1	
ECS2003	Organisational Communication	2	2	
ESI2001	Student Internship Programme	2	8	
ECS3002	Career Communication	3	2	

Application

Apply during the Joint Admissions Exercise following the release of the GCE O Level results. For other categories of local applicants, please refer to the section on “Admission and Requirements”. For international students, please refer to the section on “Information for International Students”.

Minimum Entry Requirements

5 GCE O Level subjects comprising:	
English Language (EL1)*	Grades 1 - 7
Mathematics (E or A)	Grades 1 - 6
Any one of the following subjects^	Grades 1 - 6
Any two other subjects, excluding CCA	-

^ Biology, Biotechnology, Chemistry, Combined Science, Design & Technology, Engineering Science, Physical Science, Physics, Science (Chemistry, Biology), Science (Physics, Biology), Science (Physics, Chemistry).

Note: Applicants should not be suffering from mild or severe colour vision deficiency or severe vision impairment.

** SPM / UEC holders must have a minimum of grade 6 for the Bahasa Inggeris (English Language) subject.*

DIPLOMA SUBJECTS – CORE SUBJECTS

SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS
DNG1342	Drawing Essentials	1	3
DNG1344	3D Art Fundamentals	1	3
DNG1345	Ideation	1	3
EDM1001	Modelling & Animation	1	5
EDM1002	Fundamentals of Digital Media Processing	1	4
EDR1003	Engineering Drawing	1	4
EMA1001	Engineering Mathematics 1	1	5
EMA1002	Engineering Mathematics 2	1	4
ESE1006	Computer Programming for Problem Solving	1	4
DNG2371	Interface Design	2	3
EBM2004	Project Management	2	4
EBZ2003	Engineering Economy	2	4
EDM2007	Fundamental 3D Interactive Digital Media	2	5
EDM2004	Advanced Digital Animation & Special Effects	2	4
EDM2005	Interactive Digital Media Project	2	6
EED2008	Product, Process & Computer Aided Design	2	4
EDM3001	Advanced Interactive Digital Media	3	4
EDM3002	3D Real-time Visualisation	3	4
EDM3003	Interactive 3D Display System	3	4
EED3013	Rapid Prototyping & Model Making	3	4
EMP3001	Major Project	3	12
ESE3001	Database Management System & Design	3	5
ESE3006	ASP .NET Web Programming	3	4

DIPLOMA SUBJECTS – SPECIAL ELECTIVES

You can opt to take Special Electives when offered. These optional subjects will stretch your potential and help you to meet your aspirations.

SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS
EED3009	Special Project 1	3	2
EED3010	Special Project 2	3	2
EED3011	Higher Engineering Skills 1	3	2
EED3012	Higher Engineering Skills 2	3	2
EMA3001	Higher Engineering Mathematics	3	4

CROSS-DISCIPLINARY SUBJECTS

Students are required to obtain a minimum of 9 credit units from the list of Cross-Disciplinary Subjects.

Aerospace Electronics



Step into an aircraft cockpit and you will see colourful lights, state-of-the-art instruments, bright LCD displays and dual steering systems for flight control navigation. Want to know how these systems work together to control the aircraft thousands of metres above sea level? This course will provide you with the answers, and set you on the path towards an exciting career in the aviation industry!

In this course, you will learn about avionic systems, including aircraft navigation and flight control systems, and you will also be equipped with knowledge and skills of the SAR-66 Aircraft Maintenance Licence (AML) Category B2 syllabus.

You will get to use our fully-equipped TP-Lufthansa Technical Training (LTT) aerospace training centre conveniently located on campus, and be trained by expert instructors certified by LTT, Germany. In addition, our Temasek Aviation Academy houses flight simulators and a full-sized aircraft hangar complete with a private jet, will add an authentic dimension to your learning.

TP is the only polytechnic to be certified by the Civil Aviation Authority of Singapore (CAAS) as a SAR-147 Approved Maintenance Training Organisation (AMTO). This

means your diploma will be more widely recognised by employers, and your AML apprenticeship duration after graduating from TP will also be significantly shortened, allowing you to become a Licensed Aircraft Engineer (LAE) up to 10 months sooner.

If you aspire to be a pilot, you can also fulfil your dream by taking flying lessons as part of your Higher Aerospace Training in your final semester of study, to get that coveted Private Pilot Licence (PPL).



Singapore's aerospace industry has been growing rapidly and customers' demands have become more sophisticated. We at ST Aerospace believe that these new challenges can only be met by a team of highly skilled and innovative aerospace professionals, and we believe that graduates from this course will be ready to fulfil the industry's needs.

Koh Chin Seng
Vice President, Human Resource,
ST Aerospace
Singapore-ASEAN

Career Opportunities

Singapore is today the most comprehensive aerospace maintenance, repair and overhaul (MRO) hub in Asia, accounting for a quarter of the region's MRO output. Our Aerospace industry is currently worth about S\$9 billion annually, and employs about 20,000 workers spread across more than 100 local and international companies carrying out MRO in Singapore.

It is projected that approximately one million additional personnel – including 460,000 new commercial airline pilots and 601,000 highly skilled maintenance personnel – will be needed worldwide over the next few decades, thereby giving you outstanding career prospects.

You will be highly sought-after as an aircraft maintenance engineer, aircraft electrical system specialist, avionics design and development engineer, avionics system specialist or avionics test engineer, in the fields of avionics testing and measurement, the design, development, manufacturing and technical sales of aircraft systems and components, as well as aerospace engineering support and services.

Graduation Requirements

Cumulative Grade Point Average	: min 1.0
TP Core Subjects	: 19 credit units
Diploma Subjects	
Core Subjects	: 95 credit units
Elective Subjects	: min 10 credit units
Cross-Disciplinary Subjects	: min 9 credit units
Total Credit Units Completed	: min 133 credit units

Application

Apply during the Joint Admissions Exercise following the release of the GCE O Level results. For other categories of local applicants, please refer to the section on “Admission and Requirements”. For international students, please refer to the section on “Information for International Students”.

Minimum Entry Requirements

5 GCE O Level subjects comprising:	
English Language (EL1)*	Grades 1 - 7
Mathematics (E or A)	Grades 1 - 6
Any one of the following subjects^	Grades 1 - 6
Any two other subjects, excluding CCA	-

^ Biology, Biotechnology, Chemistry, Combined Science, Design & Technology, Engineering Science, Physical Science, Physics, Science (Chemistry, Biology), Science (Physics, Biology), Science (Physics, Chemistry).

Note: Applicants should not be suffering from mild or severe colour vision deficiency, uncontrolled epilepsy, profound hearing loss, severe vision impairment or any physical impairment, or be physically dependent on mobility equipment.

** SPM / UEC holders must have a minimum of grade 6 for the Bahasa Inggeris (English Language) subject.*

Course Structure

TP CORE SUBJECTS				
SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS	
ECS1003	Writing & Oral Presentation	1	2	
ECS1004	Introduction to Effective Communication	1	2	
LEA1001	Leadership: Essential Attributes & Practice 1	1	1	
LEA1002	Leadership: Essential Attributes & Practice 2	1	1	
LEA1003	Leadership: Essential Attributes & Practice 3	1	1	
ECS2003	Organisational Communication	2	2	
ESI2001	Student Internship Programme	2	8	
ECS3002	Career Communication	3	2	

DIPLOMA SUBJECTS – CORE SUBJECTS				
SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS	
EAE1002	Aircraft Electrical Fundamentals	1	4	
EAE1004	Fundamentals of Aeronautical Science	1	5	
EAE1006	Avionic Systems	1	4	
EEE1001	Circuit Analysis	1	6	
EEE1002	Electronic Devices & Circuits	1	6	
EEE1003	Digital Fundamentals 1	1	5	
EEE1004	Digital Fundamentals 2	1	5	
EMA1001	Engineering Mathematics 1	1	5	
EMA1002	Engineering Mathematics 2	1	4	
ESC1002	Engineering Physics	1	4	
ESE1006	Computer Programming for Problem Solving	1	4	
EAE2002	Aviation Legislation & Human Factors	2	4	
EAE2003	Aircraft Electronics & Servomechanisms	2	4	
EMA2001	Engineering Mathematics 3	2	5	
EMC2001	Microcontroller Technology	2	5	
EAE3006	Radio Fundamentals & Navigation Systems	3	5	
EAE3009	Basic Aerodynamics	3	3	
EAE3018	Aircraft Digital Systems	3	5	
EMP3001	Major Project	3	12	

DIPLOMA SUBJECTS – ELECTIVE SUBJECTS

SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS
ECT2001	Circuits & Control Systems	2	5
EAE3011	Aircraft Structures & Flight Control	3	4
EAE3012	Aircraft Test & Measurement	3	3
EAE3013	Higher Aerospace Training	3	10
EAE3017	Engine Control & Instrumentations	3	4
EEE3001	Advanced Electronics	3	4
EEE3004	Power Electronics & Drives	3	4
EMC3002	Embedded Control & Applications	3	4

DIPLOMA SUBJECTS – SPECIAL ELECTIVES

You can opt to take Special Electives when offered. These optional subjects, taken in addition to the diploma elective subjects, will stretch your potential and help you to meet your aspirations.

SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS
EED3009	Special Project 1	3	2
EED3010	Special Project 2	3	2
EED3011	Higher Engineering Skills 1	3	2
EED3012	Higher Engineering Skills 2	3	2
EMA3001	Higher Engineering Mathematics	3	4

CROSS-DISCIPLINARY SUBJECTS

Students are required to obtain a minimum of 9 credit units from the list of Cross-Disciplinary Subjects.

Aerospace Engineering



Every time we hear an aircraft roaring above us, we look up to the sky and marvel at how these huge machines overcome gravity to stay airborne, how they are made, and how some of them can even fly faster than the speed of sound! In this course, we unravel these mysteries for you.

In this course, you will learn about aircraft flight, aircraft design, airframe structure, engine systems, and manufacturing of aircraft systems, and you will also be equipped with knowledge and skills of the SAR-66 Aircraft Maintenance Licence (AML) Category B1 syllabus.

You will get to use our fully-equipped TP-Lufthansa Technical Training (LTT) aerospace training centre conveniently located on campus, and be trained by expert instructors certified by LTT, Germany. Our new West Wing building housing flight simulators and a full-sized aircraft hangar complete with a private jet, will add an authentic dimension to your learning.

TP is the only polytechnic to be certified by the Civil Aviation Authority of Singapore (CAAS) as a SAR-147 Approved Maintenance Training Organisation (AMTO). This means your diploma will be more widely recognised by employers, and

your AML apprenticeship duration after graduating from TP will also be significantly shortened, allowing you to become a Licensed Aircraft Engineer (LAE) up to 10 months sooner.

If you aspire to be a pilot, you can also fulfil your dream by taking flying lessons as part of your Higher Aerospace Training in your final semester of study, to get that coveted Private Pilot Licence (PPL).



This course has shown leadership by hiring staff fresh from the industry, and partnering recognised world-class training institutions such as Lufthansa Technical Training (LTT) to inject the latest, the best, and the most realistic practices from the aviation industry into its curriculum. The knowledge that you receive as students will definitely be both current and relevant to your future work environment.

Roberto Kobeh Gonzalez
President
Council of the International Civil
Aviation Organisation (ICAO)

Career Opportunities

The aerospace industry in Singapore has been growing at an average rate of about 12% annually, and today our country is the regional leader in aerospace maintenance, repair and overhaul (MRO), manufacturing and research & development (R&D).

Our Aerospace industry is currently worth about S\$9 billion annually, and employs about 20,000 workers spread across more than 100 local and international companies carrying out MRO in Singapore. This rapid growth of the aerospace industry will create a strong demand for skilled aerospace professionals in the next few decades, so you will be highly sought-after as an aircraft maintenance engineer, structural or composites specialist, engine or power plant technologist, aerospace component design engineer, or an aeromechanical systems specialist. Your fundamental engineering training will also equip you to further your aspirations in future local and overseas degree programmes.

Application

Apply during the Joint Admissions Exercise following the release of the GCE O Level results. For other categories of local applicants, please refer to the section on “Admission and Requirements”. For international students, please refer to the section on “Information for International Students”.

Minimum Entry Requirements

5 GCE O Level subjects comprising:	
English Language (EL1)*	Grades 1 - 7
Mathematics (E or A)	Grades 1 - 6
Any one of the following subjects^	Grades 1 - 6
Any two other subjects, excluding CCA	-

^ Biology, Biotechnology, Chemistry, Combined Science, Design & Technology, Engineering Science, Physical Science, Physics, Science (Chemistry, Biology), Science (Physics, Biology), Science (Physics, Chemistry).

Note: Applicants should not be suffering from mild or severe colour vision deficiency, uncontrolled epilepsy, profound hearing loss, severe vision impairment or any physical impairment, or be physically dependent on mobility equipment.

** SPM / UEC holders must have a minimum of grade 6 for the Bahasa Inggeris (English Language) subject.*

Course Structure

TP CORE SUBJECTS				
SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS	
ECS1003	Writing & Oral Presentation	1	2	
ECS1004	Introduction to Effective Communication	1	2	
LEA1001	Leadership: Essential Attributes & Practice 1	1	1	
LEA1002	Leadership: Essential Attributes & Practice 2	1	1	
LEA1003	Leadership: Essential Attributes & Practice 3	1	1	
ECS2003	Organisational Communication	2	2	
ESI2001	Student Internship Programme	2	8	
ECS3002	Career Communication	3	2	

Graduation Requirements

Cumulative Grade Point Average	: min 1.0
TP Core Subjects	: 19 credit units
Diploma Subjects	
Core Subjects	: 98 credit units
Elective Subjects	: min 10 credit units
Cross-Disciplinary Subjects	: min 9 credit units
Total Credit Units Completed	: min 136 credit units

DIPLOMA SUBJECTS – CORE SUBJECTS

SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS
EAE1002	Aircraft Electrical Fundamentals	1	4
EAE1008	Aircraft Electronics & Digital Systems	1	4
EDR1003	Engineering Drawing	1	4
EEE1001	Circuit Analysis	1	6
EEE1002	Electronic Devices & Circuits	1	6
EEE1003	Digital Fundamentals 1	1	5
EMA1001	Engineering Mathematics 1	1	5
EMA1002	Engineering Mathematics 2	1	4
EME1002	Statics & Strength of Materials	1	4
ESC1002	Engineering Physics	1	4
ESE1006	Computer Programming for Problem Solving	1	4
EAE2002	Aviation Legislation & Human Factors	2	4
EMA2001	Engineering Mathematics 3	2	5
EMC2001	Microcontroller Technology	2	5
EME2006	Engineering Materials	2	4
EME2008	Principles of Dynamics	2	5
EME2009	Thermodynamics	2	3
EME2010	Fluid Mechanics	2	3
EAE3008	Gas Turbine Engine	3	4
EAE3009	Basic Aerodynamics	3	3
EMP3001	Major Project	3	12

DIPLOMA SUBJECTS – ELECTIVE SUBJECTS

SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS
EME2011	Engineering Design	2	3
ECT2001	Circuits & Control Systems	2	5
EAE3013	Higher Aerospace Training	3	10
EAE3015	Aircraft Structures & Composites	3	4
EAE3016	Aircraft Aerodynamics & Systems	3	3
EEE3004	Power Electronics & Drives	3	4
EAE3019	Aircraft Engine Maintenance Practices	3	3

DIPLOMA SUBJECTS – SPECIAL ELECTIVES

You can opt to take Special Electives when offered. These optional subjects, taken in addition to the diploma elective subjects, will stretch your potential and help you to meet your aspirations.

SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS
EED3009	Special Project 1	3	2
EED3010	Special Project 2	3	2
EED3011	Higher Engineering Skills 1	3	2
EED3012	Higher Engineering Skills 2	3	2
EMA3001	Higher Engineering Mathematics	3	4

CROSS-DISCIPLINARY SUBJECTS

Students are required to obtain a minimum of 9 credit units from the list of Cross-Disciplinary Subjects.

Aviation Management & Services



Over one billion people and 40 percent of the world's manufactured exports are transported by air each year, making the aviation business one of the key drivers of world trade. According to the International Air Transport Association (IATA), the aviation industry's contribution to Singapore's gross domestic product (GDP) would double to about US\$65 billion (S\$88 billion) by the year 2035, spurred by increased air travel.

The exponential growth of the aviation industry has created a high demand for specialised and highly-skilled aviation professionals to operate and manage the existing and new aviation services, facilities and infrastructures, such as Changi Airport's fourth and fifth passenger terminals, the Seletar Aerospace Park, and new state of the art aircraft such as the Airbus A350XWB and Boeing 787 Dreamliner.

This course is the first Aviation Management programme in Asia. You will learn a broad range of specialised aviation management skills and business knowledge. From understanding how to manage a world class airport to running the best airline in the world, we will prepare you for a career in the exciting aviation industry. You will also get a head start in the industry through a six-month industrial attachment in various departments of the civil aviation

authority (CAAS), renowned airlines or airport ground handling agents, or by doing ground breaking research with institutions of higher education. There are also overseas internship opportunities with regional airports and aviation companies.

No aviation programme is complete without experiencing flight! You could gain in-flight experience as a cabin crew with a Singapore-based airline as part of your diploma internship, or choose to take the first step towards being a pilot by taking our Aeronautical Science Option, in which you will go through flying and theoretical lessons required to obtain a Private Pilot's Licence (PPL). Selected foundational subjects in this Option will also give you an advantage when you pursue the Commercial Pilot Licence (CPL) or Air Transport Pilot Licence (ATPL) in future.



I remain very impressed with your aviation training programmes, the passion of your students and staff, and your innovative efforts to meet the increasing demands of the aviation industry, for a challenging present and a bright future.

Roberto Kobeh Gonzalez
President
Council of the International Civil
Aviation Organisation (ICAO)

Career Opportunities

According to IATA, the number of aviation-related jobs in Singapore is expected to double over the next 20 years, spurred by increased air travel. Hence, you can look forward to exciting and rewarding careers with airport operators, airlines, aerospace companies, aviation consulting and investment companies, civil aviation authorities, as well as ground handling and logistics companies. Your job scope would include operations and management, sales and marketing, customer service, flight operations, air traffic control, and aviation commercial development.

You will also have the option to further your studies in universities in Singapore and abroad, with as much as two years' credit exemption or advanced standing. Our diploma is well-recognised by many top universities in Australia, New Zealand, UK and USA and has built strong collaborative relationships with them.

Course Structure

TP CORE SUBJECTS				
SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS	
ECS1003	Writing & Oral Presentation	1	2	
ECS1004	Introduction to Effective Communication	1	2	
LEA1001	Leadership: Essential Attributes & Practice 1	1	1	
LEA1002	Leadership: Essential Attributes & Practice 2	1	1	
LEA1003	Leadership: Essential Attributes & Practice 3	1	1	
ECS2003	Organisational Communication	2	2	
ESI2001	Student Internship Programme	2	8	
ECS3002	Career Communication	3	2	

Application

Apply during the Joint Admissions Exercise following the release of the GCE O Level results. For other categories of local applicants, please refer to the section on "Admission and Requirements". For international students, please refer to the section on "Information for International Students".

Minimum Entry Requirements

5 GCE O Level subjects comprising:	
English Language (EL1)*	Grades 1 - 7
Mathematics (E or A)	Grades 1 - 6
Any one of the following subjects^	Grades 1 - 6
Any two other subjects, excluding CCA	-

^ Biology, Biotechnology, Chemistry, Combined Science, Design & Technology, Engineering Science, Physical Science, Physics, Science (Chemistry, Biology), Science (Physics, Biology), Science (Physics, Chemistry).

Note: Applicants should not be suffering from uncontrolled epilepsy, profound hearing loss or severe vision impairment.

** SPM / UEC holders must have a minimum of grade 6 for the Bahasa Inggeris (English Language) subject.*

Graduation Requirements

Cumulative Grade Point Average	: min 1.0
TP Core Subjects	: 19 credit units
Diploma Subjects	
Core Subjects	: 91 credit units
Elective Subjects	: min 12 credit units
Cross-Disciplinary Subjects	: min 9 credit units
Total Credit Units Completed	: min 131 credit units

DIPLOMA SUBJECTS – CORE SUBJECTS

SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS
EAD1001	Introduction to Civil Aviation	1	4
EAL1001	Principles of Aeronautical Science	1	5
EAL1003	Airline Operations	1	4
EAM1001	Airport Operations & Management	1	4
EBZ1001	Business Fundamentals	1	5
EBZ1002	Principles of Economics	1	4
EMA1001	Engineering Mathematics 1	1	5
EMA1002	Engineering Mathematics 2	1	4
ESE1006	Computer Programming for Problem Solving	1	4
ESZ1002	Quantitative Methods	1	4
EAL2005	Airline Management	2	4
EAM2007	Aviation Safety & Security	2	4
EAT2006	Airport Systems	2	4
EAT2007	Airfield Systems	2	4
EBM2004	Project Management	2	4
EBZ2003	Engineering Economy	2	4
EBZ2005	Marketing Concepts & Strategies	2	4
EBZ2006	Service Quality & Management	2	4
EBM3004	Business Continuity Management	3	4
EMP3001	Major Project	3	12

DIPLOMA SUBJECTS – DIPLOMA OPTIONS

You will take one of the following options in your final year, and will be streamed based on your interests, a selection process and a test.

SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS
<u>Airport & Airline Option</u>			
EAL3004	Management of Air Cargo	3	4
EAM3002	Airport Administration	3	4
EAT3001	Air Traffic Management	3	4
<u>Aeronautical Science Option</u>			
EAL3005	Air Navigation	3	4
EAL3006	Flight Planning	3	4
EAM3003	Meteorological Studies	3	4

CROSS-DISCIPLINARY SUBJECTS

Students are required to obtain a minimum of 9 credit units from the list of Cross-Disciplinary Subjects.

Biomedical Engineering



The development of medical devices, from a simple hearing aid to an X-ray machine; the search for a cure for human diseases; or even the very pills that you pop into your mouth – these are all part of the biomedical life sciences, which are now seeing a boom in related industries worldwide.

This course involves the application of engineering skills to the biomedical sciences and healthcare industry. You will learn the necessary biological techniques and apply them in the field of biomedical engineering. Under the Economic Development Board's plan, the field of life sciences is slated to be one of the four key pillars of Singapore's economy, besides chemicals, electronics and engineering.

Singapore is on its way to becoming a global centre for medical research and advanced patient care in specialised fields such as oncology, cardiology, ophthalmology, neurology and rehabilitation. It also aims to be a regional hub for a wide spectrum of healthcare services such as integrated healthcare services, hospital management, laboratory services, healthcare consulting, pharmaceutical research and clinical trials.

Companies dealing in medical devices and drugs will find it attractive to undertake the development and manufacturing of new drugs and medical products in

Singapore. In fact, numerous prominent overseas biomedical companies have set up base in Singapore, providing excellent job opportunities and career advancement prospects for holders of this diploma.



As the medical and healthcare solutions industry continues to globalise and advance at a rapid pace, biomedical professionals today face increasing demands and challenges. Students of this course are armed with sound fundamental knowledge, giving them a mastery of engineering skills so as to empower them to excel in their future careers while meeting the rigorous demands of this industry.

Hema Venkataraman
Director
Infinity Biomed Solutions Pte Ltd,
Singapore

Career Opportunities

You will be able to find employment in companies (MNCs, SMEs or public companies) dealing in the life sciences and electronics, as well as government agencies, health care institutions and hospitals.

There are excellent career prospects in life science research centres, providing support in medical research activities, the maintenance of equipment, and specialist procedures. You can also be employed in pharmaceutical manufacturing firms, dealing with process control and quality control, or in hospitals, handling the operations and maintenance of specialised medical equipment. Some of our graduates are in wholesale and retail firms, doing the marketing and sales of medical devices and equipment, or providing after sales services such as commissioning, maintenance and training.

Course Structure

TP CORE SUBJECTS				
SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS	
ECS1003	Writing & Oral Presentation	1	2	
ECS1004	Introduction to Effective Communication	1	2	
LEA1001	Leadership: Essential Attributes & Practice 1	1	1	
LEA1002	Leadership: Essential Attributes & Practice 2	1	1	
LEA1003	Leadership: Essential Attributes & Practice 3	1	1	
ECS2003	Organisational Communication	2	2	
ESI2001	Student Internship Programme	2	8	
ECS3002	Career Communication	3	2	

Application

Apply during the Joint Admissions Exercise following the release of the GCE O Level results. For other categories of local applicants, please refer to the section on “Admission and Requirements”. For international students, please refer to the section on “Information for International Students”.

Minimum Entry Requirements

5 GCE O Level subjects comprising:

English Language (EL1)*	Grades 1 - 7
Mathematics (E or A)	Grades 1 - 6
Any one of the following subjects^	Grades 1 - 6
Any two other subjects, excluding CCA	-

^ Biology, Biotechnology, Chemistry, Combined Science, Design & Technology, Engineering Science, Physical Science, Physics, Science (Chemistry, Biology), Science (Physics, Biology), Science (Physics, Chemistry).

Note: Applicants should not be suffering from mild or severe colour vision deficiency, uncontrolled epilepsy, profound hearing loss or severe vision impairment.

** SPM / UEC holders must have a minimum of grade 6 for the Bahasa Inggeris (English Language) subject.*

Graduation Requirements

Cumulative Grade Point Average	: min 1.0
TP Core Subjects	: 19 credit units
Diploma Subjects	
Core Subjects	: 98 credit units
Elective Subjects	: min 8 credit units
Cross-Disciplinary Subjects	: min 9 credit units
Total Credit Units Completed	: min 135 credit units

DIPLOMA SUBJECTS – CORE SUBJECTS

SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS
EBS1002	Human Anatomy & Physiology	1	5
EED1001	Electronic Prototyping	1	3
EEE1001	Circuit Analysis	1	6
EEE1002	Electronic Devices & Circuits	1	6
EEE1003	Digital Fundamentals 1	1	5
EEE1004	Digital Fundamentals 2	1	5
EMA1001	Engineering Mathematics 1	1	5
EMA1002	Engineering Mathematics 2	1	4
ESC1001	Chemistry	1	5
ESC1002	Engineering Physics	1	4
ESE1006	Computer Programming for Problem-solving	1	4
EBI2001	Introduction to Bioinformatics	2	4
EBS2002	Molecular Genetics	2	5
EEE2003	Circuits & Signals	2	4
EMA2001	Engineering Mathematics 3	2	5
EMC2001	Microcontroller Technology	2	5
EMD2001	Medical Electronics	2	4
EMD2002	Medical Devices	2	4
EBI3001	Biostatistics	3	4
EMP3001	Major Project	3	12

DIPLOMA SUBJECTS – ELECTIVE SUBJECTS

SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS
EBS1003	Biochemistry	1	4
ECT2001	Circuits & Control Systems	2	5
EBI3003	Medical Imaging & Visualisation	3	4
EBI3004	Audiometry & Hearing Devices	3	4
EBS3003	Clinical Laboratory Equipment	3	4
EEE3001	Advanced Electronics	3	4
ESE3006	ASP .NET Web Programming	3	4

DIPLOMA SUBJECTS – SPECIAL ELECTIVES

You can opt to take Special Electives when offered. These optional subjects, taken in addition to the diploma elective subjects, will stretch your potential and help you to meet your aspirations.

SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS
EED3009	Special Project 1	3	2
EED3010	Special Project 2	3	2
EED3011	Higher Engineering Skills 1	3	2
EED3012	Higher Engineering Skills 2	3	2
EMA3001	Higher Engineering Mathematics	3	4

CROSS-DISCIPLINARY SUBJECTS

Students are required to obtain a minimum of 9 credit units from the list of Cross-Disciplinary Subjects.

Business Process & Systems Engineering



In today's business environment, a company's operations are more complex and demanding, both online and offline. Tomorrow's business leaders need skills to solve related problems and refine business processes, in addition to performing the traditional role of business management. This course combines engineering disciplines with business management principles, producing graduates who are highly sought after by multi-nationals as well as small and medium enterprises, promising you a bright future.

The introduction of business concepts and principles into a core of engineering fundamentals will enable our graduates to enter both the engineering and service sectors in Singapore and the region. With Singapore's vision to be a world-class service centre and logistics hub as we move into the 21st century, there will be a strong demand for professionals with the multidisciplinary skills that this course provides.

You will be trained in both business concepts and principles as well as engineering fundamentals, thereby enabling you to enter both the engineering and service sectors in Singapore and the region.

There are two main areas in this course: Business Analytics, which is the systematic investigation of past business performance to gain insight and drive business planning; and Systems Engineering which focuses on business processes and productivity improvements at the workplace. In addition, elective subjects such as Technopreneurship, Systems Engineering Management and Service Quality & Management will equip you with a wide range of practical skills to succeed in the world of work.



The subject areas covered in this course, including process optimisation, marketing strategies and business enhancement, are very relevant to the industry and will optimally equip students to meet the challenges of today's new business environment.

Sim Sin Sin
CEO
Secret Recipe Café Pte Ltd

Career Opportunities

Armed with the knowledge of business principles, some product knowledge related to manufacturing, as well as an understanding of the systems which a company uses to engineer success and higher profits, you will be extremely versatile and will find lucrative career opportunities in the financial, manufacturing, service, and wholesale and retail sectors.

You can potentially obtain a lucrative job as a financial and business analyst, market researcher or analyst, customer sales executive, product marketing executive, quality and process control supervisor, productivity and management systems executive, front line operations manager, client relations officer, or wholesale and retail executive.

Graduation Requirements

Cumulative Grade Point Average	: min 1.0
TP Core Subjects	: 19 credit units
Diploma Subjects	
Core Subjects	: 95 credit units
Elective Subjects	: min 8 credit units
Cross-Disciplinary Subjects	: min 9 credit units
Total Credit Units Completed	: min 131 credit units

Course Structure

TP CORE SUBJECTS				
SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS	
ECS1003	Writing & Oral Presentation	1	2	
ECS1004	Introduction to Effective Communication	1	2	
LEA1001	Leadership: Essential Attributes & Practice 1	1	1	
LEA1002	Leadership: Essential Attributes & Practice 2	1	1	
LEA1003	Leadership: Essential Attributes & Practice 3	1	1	
ECS2003	Organisational Communication	2	2	
ESI2001	Student Internship Programme	2	8	
ECS3002	Career Communication	3	2	

Application

Apply during the Joint Admissions Exercise following the release of the GCE O Level results. For other categories of local applicants, please refer to the section on “Admission and Requirements”. For international students, please refer to the section on “Information for International Students”.

Minimum Entry Requirements

5 GCE O Level subjects comprising:	
English Language (EL1)*	Grades 1 - 7
Mathematics (E or A)	Grades 1 - 6
Any one of the following subjects^	Grades 1 - 6
Any two other subjects, excluding CCA	-

^ Biology, Biotechnology, Chemistry, Combined Science, Design & Technology, Engineering Science, Physical Science, Physics, Science (Chemistry, Biology), Science (Physics, Biology), Science (Physics, Chemistry).

Note: Applicants should not be suffering from severe vision impairment.

** SPM / UEC holders must have a minimum of grade 6 for the Bahasa Inggeris (English Language) subject.*

DIPLOMA SUBJECTS – CORE SUBJECTS

SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS
EBZ1001	Business Fundamentals	1	5
EBZ1002	Principles of Economics	1	4
EMA1001	Engineering Mathematics 1	1	5
EMA1002	Engineering Mathematics 2	1	4
EPZ1001	Introduction to Processes & Systems	1	4
ESC1002	Engineering Physics	1	4
ESE1006	Computer Programming for Problem Solving	1	4
ESZ1001	Systems Concepts & Tools	1	4
ESZ1002	Quantitative Methods	1	4
EBM2004	Project Management	2	4
EBZ2002	Marketing Intelligence	2	4
EBZ2003	Engineering Economy	2	4
EBZ2005	Marketing Concepts & Strategies	2	4
EQM2001	Process Management & Innovation	2	4
ESZ2001	Decision Analysis	2	4
ESZ2002	Process Optimisation & Improvement	2	4
ESZ2003	Management Systems & Assessment	2	5
EMF3002	Manufacturing Logistics & Simulation	3	4
EMP3001	Major Project	3	12
EPZ3001	Customer Relationship Management	3	4
ESZ3002	Systems Modelling & Simulation	3	4

DIPLOMA SUBJECTS – ELECTIVE SUBJECTS

SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS
EBZ2006	Service Quality & Management	2	4
EBZ3008	Technopreneurship	3	4
ESZ3001	Supply Chain Management	3	4
ESZ3003	Systems Engineering & Management	3	4

DIPLOMA SUBJECTS – SPECIAL ELECTIVES

You can opt to take Special Electives when offered. These optional subjects, taken in addition to the diploma elective subjects, will stretch your potential and help you to meet your aspirations.

SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS
EED3009	Special Project 1	3	2
EED3010	Special Project 2	3	2
EED3011	Higher Engineering Skills 1	3	2
EED3012	Higher Engineering Skills 2	3	2
EMA3001	Higher Engineering Mathematics	3	4

CROSS-DISCIPLINARY SUBJECTS

Students are required to obtain a minimum of 9 credit units from the list of Cross-Disciplinary Subjects.

Clean Energy



Green businesses and eco-industries have increasingly become the important economic pillars of Singapore. Clean Energy is an important part of these green industries, which are expected to create 20,000 new jobs by 2020. Therefore, the number of eco-product designers, green entrepreneurs and energy managers will continue to grow rapidly, giving you excellent future prospects.

This course will equip you with the knowledge and skills in four key areas, namely, renewable energy technologies, green electronics and automation, smart and efficient power systems and green transportation.

You will also be able to sharpen your skills with a wide range of exciting state-of-the-art learning facilities in our campus, such as our Smart Energy Training Systems, our Clean Energy Research Centre, and a solar “LIVE” Laboratory. These will not only enhance your learning experiences, but also ensure that you are competent and ready to work in the industry upon graduation.

With your diploma, you will also be eligible to apply for the Associate Singapore Certified Energy Manager (ASCEM) accreditation programme, an industry-recognised certification that will give you a career advantage.

In this course, you will get to take part in a wide range of vibrant and enriching activities such as leadership camps, the Youth Energy Showcase, Energy Connect seminars, sports activities, and social or community events. You will also have opportunities to gain global exposure through internship programmes at overseas institutions such as the University of New South Wales in Australia and Southwest Jiaotong University in China.

If you are passionate about the environment, you can participate in meaningful Overseas Community Projects in countries such as Thailand, Laos and Cambodia where you get to apply what you have learnt about solar technology, to design and install solar-powered LED lighting to light up the lives of locals there.



From a small base today, the clean energy sector here is growing rapidly, thanks to several government initiatives and the declining cost of technology. We anticipate significant demand for qualified personnel in the clean energy industry over the next few decades.

Christophe Inglin
Managing Director
Phoenix Solar Pte Ltd

Career Opportunities

As part of Singapore’s objective of becoming a Smart Nation, the government has implemented a comprehensive plan to transform our country into a global clean energy hub. Some of the measures include the “SolarNova Programme” which involves a project to install solar panels on the roofs of thousands of HDB blocks by 2020, the “Green Mark Programme” to “green” 80 percent of Singapore’s buildings by 2030, and the enactment of Energy Conservation Acts by NEA from 2013 to regulate sustainable energy management.

All these mean that you will have bright prospects as there will be a great demand for clean energy professionals. You can find exciting and fulfilling careers in the solar photovoltaic, air conditioning and refrigeration, energy services, building & construction, electrical power, green manufacturing and public service sectors as a project engineer, design engineer, facility engineer, system engineer, R&D engineer, industrial engineer, process engineer, equipment engineer, public service officer (energy planning, green transportation, environmental management), energy auditor, energy consultant, associate energy manager or even a green entrepreneur.

If you like smart technologies and managing future green cities, and care about saving Gaia, you are the right person to join this course!

Application

Apply during the Joint Admissions Exercise following the release of the GCE O Level results. For other categories of local applicants, please refer to the section on “Admission and Requirements”. For international students, please refer to the section on “Information for International Students”.

Minimum Entry Requirements

5 GCE O Level subjects comprising:	
English Language (EL1)*	Grades 1 - 7
Mathematics (E or A)	Grades 1 - 6
Any one of the following subjects^	Grades 1 - 6
Any two other subjects, excluding CCA	-

^ Biology, Biotechnology, Chemistry, Combined Science, Design & Technology, Engineering Science, Physical Science, Physics, Science (Chemistry, Biology), Science (Physics, Biology), Science (Physics, Chemistry).

Note: Applicants should not be suffering from severe colour vision deficiency, uncontrolled epilepsy, profound hearing loss or severe vision impairment.

** SPM / UEC holders must have a minimum of grade 6 for the Bahasa Inggeris (English Language) subject.*

Graduation Requirements

Cumulative Grade Point Average	: min 1.0
TP Core Subjects	: 19 credit units
Diploma Core Subjects	: 106 credit units
Cross-Disciplinary Subjects	: min 9 credit units
Total Credit Units Completed	: min 134 credit units

Course Structure

TP CORE SUBJECTS				
SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS	
ECS1003	Writing & Oral Presentation	1	2	
ECS1004	Introduction to Effective Communication	1	2	
LEA1001	Leadership: Essential Attributes & Practice 1	1	1	
LEA1002	Leadership: Essential Attributes & Practice 2	1	1	
LEA1003	Leadership: Essential Attributes & Practice 3	1	1	
ECS2003	Organisational Communication	2	2	
ESI2001	Student Internship Programme	2	8	
ECS3002	Career Communication	3	2	

DIPLOMA SUBJECTS – CORE SUBJECTS

SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS
EED1001	Electronic Prototyping	1	3
EEE1001	Circuit Analysis	1	6
EEE1002	Electronic Devices & Circuits	1	6
EEE1003	Digital Fundamentals 1	1	5
EEE1004	Digital Fundamentals 2	1	5
EER1001	Electrical Services for Facilities	1	4
EMA1001	Engineering Mathematics 1	1	5
EMA1002	Engineering Mathematics 2	1	4
ESC1002	Engineering Physics	1	4
ESE1006	Computer Programming for Problem Solving	1	4
ECE2001	Energy Conversion & Storage Systems	2	4
ECE2003	Fuel Cell Design & Testing	2	4
ECE2005	Fundamentals of Clean Energy	2	5
ECE2006	Solar Cell & System	2	5
EER2001	Electrical Systems & Power Distribution	2	4
EGB2002	Air Conditioning & Mechanical Ventilation	2	4
EMA2001	Engineering Mathematics 3	2	5
EMC2001	Microcontroller Technology	2	5
EBM3005	Energy Management & Audit	3	4
ECE3001	Clean Energy Process Integration	3	4
ECE3003	Energy Efficiency & Efficient Drive	3	4
EMP3001	Major Project	3	12

DIPLOMA SUBJECTS – SPECIAL ELECTIVES

You can opt to take Special Electives when offered. These optional subjects, taken in addition to the diploma elective subjects, will stretch your potential and help you to meet your aspirations.

SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS
EED3009	Special Project 1	3	2
EED3010	Special Project 2	3	2
EED3011	Higher Engineering Skills 1	3	2
EED3012	Higher Engineering Skills 2	3	2
EMA3001	Higher Engineering Mathematics	3	4

CROSS-DISCIPLINARY SUBJECTS

Students are required to obtain a minimum of 9 credit units from the list of Cross-Disciplinary Subjects.

Computer Engineering



In today's economy, computer engineering is highly pervasive across almost every sector, from high-tech manufacturing, aerospace, aviation, transportation, telecommunication and healthcare to finance and business.

Emerging trends such as Internet of Things (IoT), Data Analytics, Artificial Intelligence and Smart Manufacturing are set to impact Singapore both socially and economically. This will give rise to a great demand for computer engineers. To meet this demand, TP's Computer Engineering course aims to equip you with knowledge and skills in embedded systems to make things smart, computer networking for wired and wireless connectivity, internet technology - to create web and mobile applications, and system integration to put together solutions.

Such a multi-disciplinary, winning combination of electronics and computer science prepares you to be amongst the few who are fully proficient in hardware, software and integration of hardware and software systems, to become total solution providers who are much sought after across various industry sectors. The course prepares you for internationally recognized industry certification examinations such as from National Instruments, CompTIA, Oracle, Microsoft and Cisco. You will also be equipped with skills to learn "how to learn", which would ensure that you stay

relevant and are able to quickly adapt to change with the advent of "disruptive technologies" today.



We were deeply impressed by your student intern's technical competence, problem-solving skills, independent learning attitude and great initiative. Her work on an exploratory research-based project has culminated in a working framework that integrates modules across different applications. This is a testimony to the success of your course in equipping students with the critical competencies to meet the dynamic needs of today's industry.

Dr Lim Joo Hwee
Head, Visual Computing Department
Institute for Infocomm Research, A*STAR

Career Opportunities

It is estimated that nearly 50 billion devices in the world will be connected to the Internet by 2020. As Singapore progresses towards becoming a Smart Nation, IoT is poised to bring tremendous value and demand for computer engineers in a wide range of industries such as transportation, healthcare, retail, logistics & supply chain, smart grid and even the government sector. You can therefore look forward to excellent career prospects as this course equips you with the skills that IoT requires. You can establish a career as a hardware engineer, system engineer, network engineer, software engineer, or embedded/firmware engineer.

If you are interested to further your studies, many local and foreign universities offer our diploma holders advanced standing for their degree courses. In particular, NTU grants our graduates direct entry into the second year of degree programmes in Computer Engineering, Computer Science and Electrical & Electronic Engineering, while NUS grants exemptions for selected modules amounting to almost a year.

Course Structure

TP CORE SUBJECTS				
SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS	
ECS1003	Writing & Oral Presentation	1	2	
ECS1004	Introduction to Effective Communication	1	2	
LEA1001	Leadership: Essential Attributes & Practice 1	1	1	
LEA1002	Leadership: Essential Attributes & Practice 2	1	1	
LEA1003	Leadership: Essential Attributes & Practice 3	1	1	
ECS2003	Organisational Communication	2	2	
ESI2001	Student Internship Programme	2	8	
ECS3002	Career Communication	3	2	

Application

Apply during the Joint Admissions Exercise following the release of the GCE O Level results. For other categories of local applicants, please refer to the section on “Admission and Requirements”. For international students, please refer to the section on “Information for International Students”.

Minimum Entry Requirements

5 GCE O Level subjects comprising:	
English Language (EL1)*	Grades 1 - 7
Mathematics (E or A)	Grades 1 - 6
Any one of the following subjects^	Grades 1 - 6
Any two other subjects, excluding CCA	-

^ Biology, Biotechnology, Chemistry, Combined Science, Design & Technology, Engineering Science, Physical Science, Physics, Science (Chemistry, Biology), Science (Physics, Biology), Science (Physics, Chemistry).

Note: Applicants should not be suffering from severe colour vision deficiency, uncontrolled epilepsy, profound hearing loss or severe vision impairment.

** SPM / UEC holders must have a minimum of grade 6 for the Bahasa Inggeris (English Language) subject.*

Graduation Requirements

Cumulative Grade Point Average	: min 1.0
TP Core Subjects	: 19 credit units
Diploma Subjects	
Core Subjects	: 97 credit units
Elective Subjects	: min 8 credit units
Cross-Disciplinary Subjects	: min 9 credit units
Total Credit Units Completed	: min 133 credit units

DIPLOMA SUBJECTS – CORE SUBJECTS

SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS
ECC1002	Networking Fundamentals	1	4
EED1001	Electronic Prototyping	1	3
EED1002	Printed Circuit Board Design	1	3
EEE1001	Circuit Analysis	1	6
EEE1002	Electronic Devices & Circuits	1	6
EEE1003	Digital Fundamentals 1	1	5
EEE1004	Digital Fundamentals 2	1	5
EMA1001	Engineering Mathematics 1	1	5
EMA1002	Engineering Mathematics 2	1	4
ESC1002	Engineering Physics	1	4
ESE1006	Computer Programming for Problem Solving	1	4
EMA2001	Engineering Mathematics 3	2	5
EMC2001	Microcontroller Technology	2	5
EMC2005	Computer Interfacing	2	4
ESE2004	Object-oriented Programming	2	5
ESE3006	ASP .NET Web Programming	3	4
EMC3002	Embedded Control & Applications	3	4
EMP3001	Major Project	3	12
ESE3001	Database Management System & Design	3	5
ESE3009	Computer Architecture & Operating Systems	3	4

DIPLOMA SUBJECTS – ELECTIVE SUBJECTS

SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS
EMC3004	Data Acquisition Systems	3	4
EWN3001	Wireless Area Network Technologies	3	4
ESE3008	Web Services Development	3	4

DIPLOMA SUBJECTS – SPECIAL ELECTIVES

You can opt to take Special Electives when offered. These optional subjects, taken in addition to the diploma elective subjects, will stretch your potential and help you to meet your aspirations.

SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS
EED3009	Special Project 1	3	2
EED3010	Special Project 2	3	2
EED3011	Higher Engineering Skills 1	3	2
EED3012	Higher Engineering Skills 2	3	2
EMA3001	Higher Engineering Mathematics	3	4

CROSS-DISCIPLINARY SUBJECTS

Students are required to obtain a minimum of 9 credit units from the list of Cross-Disciplinary Subjects.

Electronics



Electronics is an important part of the everyday operation of homes, offices, healthcare, factories and personal lifestyle. Satellite communication, sophisticated defence systems, medical equipment and multimedia systems are all made possible through electronics. This course will give you tremendous flexibility and width – a springboard to a wide range of career options.

The Economic Development Board of Singapore aims to develop the country into a world-class electronics hub providing technology with end-to-end R&D capabilities and position it as the choice location for companies to create and manage new markets, products, processes technologies and applications.

This course is positioned to be in line with industry goals and trends. It provides you with a solid foundation in the principles and applications of electronic devices, circuits, and systems, so as to equip you to meet the changing needs of the industry. Special emphasis is placed on embedded systems, networking, telecommunication, and power electronics and control. You will also develop effective communication, problem-solving and teamwork skills to prepare you for the workplace, as well as skills in project planning and management.

To be better prepared for the advancements in technology, second-year students can choose to take one of the following Cluster Electives or Options. These are: Avionics, Networking, Robotics or Business.



This course has proven itself successful in equipping its students with not only technical knowledge but also innovative ability and problem-solving skills. We strongly believe that the graduates from this course will bring the engineering field to a whole new level.

Liow Seow Poh
Senior Manager
Electronic Service Centre
SDDA Pte Ltd (A company of ST Kinetics)

Career Opportunities

Singapore's vision is to become a world-class electronics hub with global leadership in providing technology in manufacturing solutions, as well as in the creation and management of new products, applications and markets. New jobs will be created for knowledge-workers as the industry moves into high-end design work and high-end manufacturing and marketing activities. You will have excellent and flexible career prospects in aerospace, telecommunication, instrumentation and control, computing, consumer and industrial electronics industries. Your job areas may include product design, development & testing, process improvement, maintenance, marketing and sales.

Graduation Requirements

Cumulative Grade Point Average	: min 1.0
TP Core Subjects	: 19 credit units
Diploma Subjects	
Core Subjects	: 59 credit units
Option / Elective Subjects	: 45 to 47 credit units
Cross-Disciplinary Subjects	: min 9 credit units
Total Credit Units Completed	: min 132 credit units

Course Structure

TP CORE SUBJECTS				
SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS	
ECS1003	Writing & Oral Presentation	1	2	
ECS1004	Introduction to Effective Communication	1	2	
LEA1001	Leadership: Essential Attributes & Practice 1	1	1	
LEA1002	Leadership: Essential Attributes & Practice 2	1	1	
LEA1003	Leadership: Essential Attributes & Practice 3	1	1	
ECS2003	Organisational Communication	2	2	
ESI2001	Student Internship Programme	2	8	
ECS3002	Career Communication	3	2	

Application

Apply during the Joint Admissions Exercise following the release of the GCE O Level results. For other categories of local applicants, please refer to the section on "Admission and Requirements". For international students, please refer to the section on "Information for International Students".

Minimum Entry Requirements

5 GCE O Level subjects comprising:	
English Language (EL1)*	Grades 1 - 7
Mathematics (E or A)	Grades 1 - 6
Any one of the following subjects^	Grades 1 - 6
Any two other subjects, excluding CCA	-

^ Biology, Biotechnology, Chemistry, Combined Science, Design & Technology, Engineering Science, Physical Science, Physics, Science (Chemistry, Biology), Science (Physics, Biology), Science (Physics, Chemistry).

Note: Applicants should not be suffering from severe colour vision deficiency, uncontrolled epilepsy, profound hearing loss or severe vision impairment.

** SPM / UEC holders must have a minimum of grade 6 for the Bahasa Inggeris (English Language) subject.*

DIPLOMA SUBJECTS - CORE SUBJECTS

SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS
EED1001	Electronic Prototyping	1	3
EEE1001	Circuit Analysis	1	6
EEE1002	Electronic Devices & Circuits	1	6
EEE1003	Digital Fundamentals 1	1	5
EEE1004	Digital Fundamentals 2	1	5
EMA1001	Engineering Mathematics 1	1	5
EMA1002	Engineering Mathematics 2	1	4
ESC1002	Engineering Physics	1	4
ESE1006	Computer Programming for Problem Solving	1	4
ETW2012	Electronic Communication Principles	2	5
EMP3001	Major Project	3	12

DIPLOMA SUBJECTS – OPTION SUBJECTS

SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS
<u>Engineering Business</u>			
EBZ1001	Business Fundamentals	1	5
EBZ1002	Principles of Economics	1	4
ECC1002	Networking Fundamentals	1	4
ESZ1002	Quantitative Methods	1	4
EBZ2002	Marketing Intelligence	2	4
EBZ2003	Engineering Economy	2	4
EBZ2005	Marketing Concepts & Strategies	2	4
EBZ2006	Service Quality & Management	2	4
ECS2002	Engineering Business Communication	2	4
EBZ3008	Technopreneurship	3	4
EPZ3001	Customer Relationship Management	3	4

DIPLOMA SUBJECTS – CLUSTER ELECTIVE SUBJECTS

You can opt to take Cluster Electives when offered. These optional subjects will stretch your potential and help you to meet your aspirations.

SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS
<u>Avionics</u>			
EAE1006	Avionic Systems	1	4
EED1002	Printed Circuit Board Design	1	3
ECT2001	Circuits & Control Systems	2	5
EEE2001	Integrated Circuit Applications	2	4
EMA2001	Engineering Mathematics 3	2	5
EMC2001	Microcontroller Technology	2	5
EAE3011	Aircraft Structures & Flight Control	3	4
EAE3012	Aircraft Test & Measurement	3	3
EEE3001	Advanced Electronics	3	4
EEE3004	Power Electronics & Drives	3	4
EMC3002	Embedded Control & Applications	3	4
<u>Networking</u>			
ECC1002	Networking Fundamentals	1	4
EED1002	Printed Circuit Board Design	1	3
ECC2012	Network Infrastructure Technologies	2	5
ECT2001	Circuits & Control Systems	2	5
EEE2001	Integrated Circuit Applications	2	4
EMA2001	Engineering Mathematics 3	2	5
EMC2001	Microcontroller Technology	2	5
EEE3001	Advanced Electronics	3	4
EEE3004	Power Electronics & Drives	3	4
EMC3002	Embedded Control & Applications	3	4
EWN3001	Wireless Area Network Technologies	3	4

SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS
<u>Robotics</u>			
EED1002	Printed Circuit Board Design	1	3
ECT2001	Circuits & Control Systems	2	5
EEE2001	Integrated Circuit Applications	2	4
EMA2001	Engineering Mathematics 3	2	5
EMC2001	Microcontroller Technology	2	5
EMC3004	Data Acquisition Systems	3	4
ECT3002	Analytical Robotics	3	4
ECT3003	Robotic Control Systems	3	4
EEE3001	Advanced Electronics	3	4
EEE3004	Power Electronics & Drives	3	4
EMC3002	Embedded Control & Applications	3	4

DIPLOMA SUBJECTS – SPECIAL ELECTIVES

You can opt to take Special Electives when offered. These optional subjects, taken in addition to the diploma elective subjects, will stretch your potential and help you to meet your aspirations.

SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS
EED3009	Special Project 1	3	2
EED3010	Special Project 2	3	2
EED3011	Higher Engineering Skills 1	3	2
EED3012	Higher Engineering Skills 2	3	2
EMA3001	Higher Engineering Mathematics	3	4

CROSS-DISCIPLINARY SUBJECTS

Students are required to obtain a minimum of 9 credit units from the list of Cross-Disciplinary Subjects.

Green Building & Sustainability



“Going Green” is today’s catch phrase, reflecting the growing worldwide concern for the environment. A green building is one that is designed to reduce its impact on mankind and the environment. Despite rapid urbanisation, we must ensure that our future is safe and healthy for everyone – in other words, there must be sustainability.

New buildings – both commercial as well as residential – now come with not just automated high-tech gadgets, but also energy-saving features. This focus on environment-friendly buildings is not just a local industry trend; it is part of a global push by governments worldwide to create an environmentally sustainable infrastructure that will support the emerging lifestyles of a new generation of people with higher expectations of how they live, work, and play.

This course will equip you with the knowledge of green building architecture, technologies and practices, including passive and sustainable design, energy auditing and building management. Subjects such as Total Building Performance and Energy Audit and Measurements will give you the fundamental knowledge of good green building practices and designs. You will also be trained in the

use of industry software for architectural drawings and building performance simulations.

In addition to the diploma, graduates from this course will be awarded the Associate Singapore Certified Energy Manager (ASCEM) certificate which is jointly administered by the National Environment Agency (NEA) and the institution of Engineers, Singapore (IES). The demand for ASCEM professionals has increased greatly with the need for energy conservation in every building and it is the most sought after certification for people who wish to pursue a career in the energy conservation industry.



The re-launching of this course to emphasise today’s green initiatives and the worldwide push to make buildings more environment-friendly is definitely a step in the right direction. We are confident that this course will produce the necessary skilled manpower for this emerging industry with great potential.

Tan Tian Chong
Director, Technology Development
Building & Construction Authority

Career Opportunities

With the launch of the Building & Construction Authority's "Green Mark" rating system to evaluate a building's environmental friendliness, building and property owners are now striving to adopt green building technologies and the best practices in environmental design and construction.

Green buildings currently make up more than 31 percent of buildings in Singapore, but come 2030, that figure is targeted to reach 80 percent of all buildings, driven by government funding to "green" all existing buildings. This alone gives an indication of the amount of retrofitting that will need to be done to buildings in our country, creating abundant job opportunities and demand for green building professionals. At the same time, new buildings coming on-stream need to incorporate green features and technology as well, adding to the demand.

You can look forward to careers in the energy market, sustainable design or building design industries, and find exciting job opportunities as an energy or green building consultant, an eco-city planner or designer, a green marketing executive or an environmentally sustainable design (ESD) engineer.

You can also further your qualifications in the fields of sustainable design and architectural-related programmes. Under a special arrangement, our diploma holders can get an Honours degree in Architectural Engineering from the University of Northumbria, UK, in just one year, or a Masters degree in two years.

Application

Apply during the Joint Admissions Exercise following the release of the GCE O Level results. For other categories of local applicants, please refer to the section on "Admission and Requirements". For international students, please refer to the section on "Information for International Students".

Minimum Entry Requirements

5 GCE O Level subjects comprising:	
English Language (EL1)*	Grades 1 - 7
Mathematics (E or A)	Grades 1 - 6
Any one of the following subjects^	Grades 1 - 6
Any two other subjects, excluding CCA	-

^ Biology, Biotechnology, Chemistry, Combined Science, Design & Technology, Engineering Science, Physical Science, Physics, Science (Chemistry, Biology), Science (Physics, Biology), Science (Physics, Chemistry).

Note: Applicants should not be suffering from uncontrolled epilepsy, profound hearing loss or severe vision impairment.

** SPM / UEC holders must have a minimum of grade 6 for the Bahasa Inggeris (English Language) subject.*

Graduation Requirements

Cumulative Grade Point Average	: min 1.0
TP Core Subjects	: 19 credit units
Diploma Subjects	
Core Subjects	: 97 credit units
Option / Elective Subjects	: min 8 credit units
Cross-Disciplinary Subjects	: min 9 credit units
Total Credit Units Completed	: min 133 credit units

Course Structure

TP CORE SUBJECTS				
SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS	
ECS1003	Writing & Oral Presentation	1	2	
ECS1004	Introduction to Effective Communication	1	2	
LEA1001	Leadership: Essential Attributes & Practice 1	1	1	
LEA1002	Leadership: Essential Attributes & Practice 2	1	1	
LEA1003	Leadership: Essential Attributes & Practice 3	1	1	
ECS2003	Organisational Communication	2	2	
ESI2001	Student Internship Programme	2	8	
ECS3002	Career Communication	3	2	

DIPLOMA SUBJECTS – CORE SUBJECTS

SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS
EBD1003	Computer Aided Design & Space Planning	1	4
EEE1001	Circuit Analysis	1	6
EEE1003	Digital Fundamentals 1	1	5
EER1001	Electrical Services for Facilities	1	4
EMA1001	Engineering Mathematics 1	1	5
EMA1002	Engineering Mathematics 2	1	4
EGB1001	Introduction to Green Development	1	4
EGB1002	Principles of Passive Design	1	4
ESC1002	Engineering Physics	1	4
ESE1006	Computer Programming for Problem Solving	1	4
EBD2008	Building Information Modelling	2	4
EBZ2003	Engineering Economy	2	4
EBM2004	Project Management	2	4
EBM2006	Building Management Systems	2	5
EBM2005	Fire & Life Safety Management	2	4
EGB2002	Air Conditioning & Mechanical Ventilation	2	4
EGB2003	Hydraulics & Drives	2	4
EGB3002	Green Building Modelling & Simulation	3	4
EGB3003	Total Building Performance	3	4
EBM3005	Energy Management & Audit	3	4
EMP3001	Major Project	3	12

DIPLOMA SUBJECTS – CLUSTER ELECTIVE SUBJECTS

You can opt to take Cluster Electives when offered. These optional subjects will stretch your potential and help you to meet your aspirations.

SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS
<u>Passive Building Design</u>			
EGB2004	Tropical Architecture for Sustainability	2	4
EGB3004	Sustainable Design	3	4
<u>Green Technologies</u>			
ECE2005	Fundamentals of Clean Energy	2	5
EGB3001	Green Strategies for Building Systems	3	4

DIPLOMA SUBJECTS – SPECIAL ELECTIVE SUBJECTS

You can opt to take Special Electives when offered. These optional subjects, taken in addition to the diploma cluster elective subjects, will stretch your potential and help you to meet your aspirations.

SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS
EED3009	Special Project 1	3	2
EED3010	Special Project 2	3	2
EED3011	Higher Engineering Skills 1	3	2
EED3012	Higher Engineering Skills 2	3	2
EMA3001	Higher Engineering Mathematics	3	4

CROSS-DISCIPLINARY SUBJECTS

Students are required to obtain a minimum of 9 credit units from the list of Cross-Disciplinary Subjects.

Integrated Facility Management



Integrated Resorts, airports, business towers, factories, shopping complexes, hospitals, schools – these facilities house an overwhelming amount of human activity. Who are the people who manage these facilities to ensure that businesses benefit? Who provides residents with the greatest human comfort at the least cost to the environment? Welcome to the world of Facility Management.

Facility Management encompasses multiple disciplines to ensure functionality of the built environment by integrating people, places, processes and technology. In this course, you will be trained in the skills of facility management with an integrated, strategic and sustainable mind-set, and you will be equipped to meet the challenges of different kinds of facilities. You can also take additional Cluster Electives in two very promising industries: Aviation Facilities and Hospitality Facilities.

As the first diploma course in Singapore dealing with facility management for the hospitality and aviation industries, and also the first diploma course in the world to be accredited by IFMA Foundation as an Accredited Degree Programme, this course will give you a worldwide competitive edge.



This course has an outstanding faculty, curriculum, student body, as well as facilities. The Commission on Academic Affairs of IFMA is impressed with the technical depth of this IFM programme.

Charles M Claar
Commission on Academic Affairs (2010)
International Facility Management
Association (IFMA) Foundation

Career Opportunities

Armed with multi-disciplinary skills, you will find employment in the facilities management or development teams in the airport, hospitality and tourism, events and conventions, leisure and entertainment, integrated resorts, business and financial sectors.

On top of your diploma, the competencies you will develop will enable you to pursue numerous certifications recognised by the industry. These include the Facility Management Professional (FMP) certification by the International Facility Management Association (IFMA), the Fire Safety Manager (FSM) certification by the Singapore Civil Defence Force (SCDF), the Certified Associate in Project Management (CAPM) certification by the Project Management Institute (PMI), the Certification in Business Continuity Management by the Business Continuity Management Institute (BCMI) as well as Associate Certified Project Engineer (Assoc. CPE) certification from the Institution of Engineers Singapore (IES).

Course Structure

TP CORE SUBJECTS				
SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS	
ECS1003	Writing & Oral Presentation	1	2	
ECS1004	Introduction to Effective Communication	1	2	
LEA1001	Leadership: Essential Attributes & Practice 1	1	1	
LEA1002	Leadership: Essential Attributes & Practice 2	1	1	
LEA1003	Leadership: Essential Attributes & Practice 3	1	1	
ECS2003	Organisational Communication	2	2	
ESI2001	Student Internship Programme	2	8	
ECS3002	Career Communication	3	2	

Application

Apply during the Joint Admissions Exercise following the release of the GCE O Level results. For other categories of local applicants, please refer to the section on “Admission and Requirements”. For international students, please refer to the section on “Information for International Students”.

Minimum Entry Requirements

5 GCE O Level subjects comprising:	
English Language (EL1)*	Grades 1 - 7
Mathematics (E or A)	Grades 1 - 6
Any one of the following subjects^	Grades 1 - 6
Any two other subjects, excluding CCA	-

^ Biology, Biotechnology, Chemistry, Combined Science, Design & Technology, Engineering Science, Physical Science, Physics, Science (Chemistry, Biology), Science (Physics, Biology), Science (Physics, Chemistry).

Note: Applicants should not be suffering from severe vision impairment.

** SPM / UEC holders must have a minimum of grade 6 for the Bahasa Inggeris (English Language) subject.*

Graduation Requirements

Cumulative Grade Point Average	: min 1.0
TP Core Subjects	: 19 credit units
Diploma Subjects	
Core Subjects	: 93 credit units
Option / Elective Subjects	: 12 credit units
Cross-Disciplinary Subjects	: min 9 credit units
Total Credit Units Completed	: min 133 credit units

DIPLOMA SUBJECTS – CORE SUBJECTS

SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS
EBD1003	Computer Aided Design & Space Planning	1	4
EBM1002	Real Estate Business	1	4
EBT1003	Facilities Operations & Maintenance	1	4
EER1001	Electrical Services for Facilities	1	4
EFM1002	Workplace Safety & Health for Facility Management	1	4
EMA1001	Engineering Mathematics 1	1	5
EMA1002	Engineering Mathematics 2	1	4
ESE1006	Computer Programming for Problem Solving	1	4
ESZ1002	Quantitative Methods	1	4
EBD2005	Security & Surveillance	2	4
EBD2008	Building Information Modelling	2	4
EBM2004	Project Management	2	4
EBM2005	Fire & Life Safety Management	2	4
EBZ2003	Engineering Economy	2	4
EBZ2006	Service Quality & Management	2	4
EFM2004	Contract Management	2	4
EGB2002	Air Conditioning & Mechanical Ventilation	2	4
EBM3005	Energy Management & Audit	3	4
EFM3001	Sustainable Facility Management	3	4
EGB3003	Total Building Performance	3	4
EMP3001	Major Project	3	12

DIPLOMA SUBJECTS – CLUSTER ELECTIVE SUBJECTS

You can opt to take Cluster Electives when offered. These optional subjects will stretch your potential and help you to meet your aspirations.

SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS
<u>Hospitality Cluster</u>			
BHT1010	Introduction to Hospitality & Tourism	1	4
BHT2003	Club & Resort Business	2	4
BHT2005	Event Management	2	4
<u>Aviation Cluster</u>			
EAM1001	Airport Operations & Management	1	4
EAT2006	Airport Systems	2	4
EAM3002	Airport Administration	3	4

DIPLOMA SUBJECTS – SPECIAL ELECTIVES

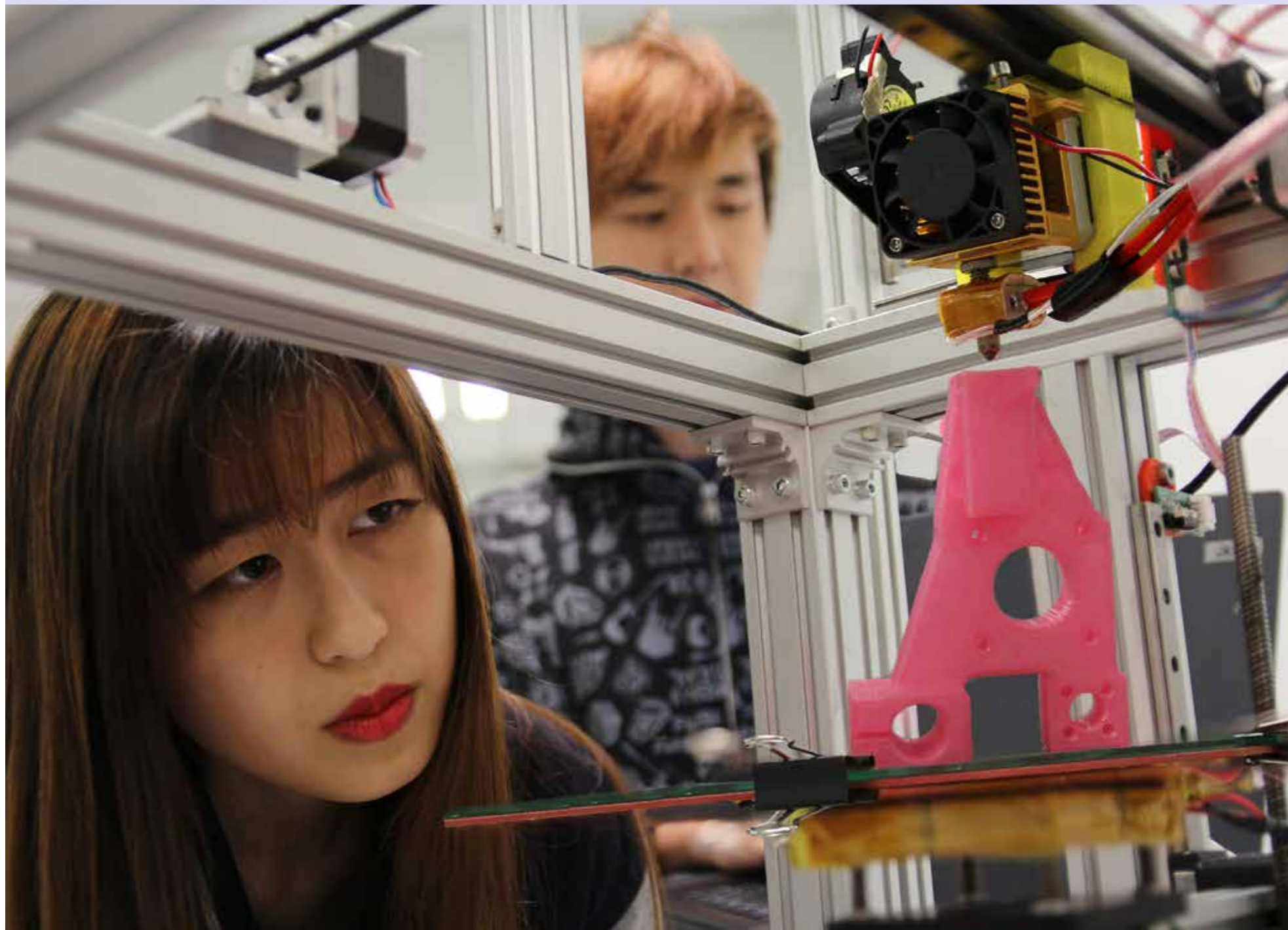
You can opt to take Special Electives when offered. These optional subjects, taken in addition to the diploma elective subjects, will stretch your potential and help you to meet your aspirations.

SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS
EED3009	Special Project 1	3	2
EED3010	Special Project 2	3	2
EED3011	Higher Engineering Skills 1	3	2
EED3012	Higher Engineering Skills 2	3	2
EMA3001	Higher Engineering Mathematics	3	4

CROSS-DISCIPLINARY SUBJECTS

Students are required to obtain a minimum of 9 credit units from the list of Cross-Disciplinary Subjects.

Mechatronics



In an era that increasingly values productivity, engineering employers favour graduates with knowledge of both mechanical engineering and electronics, and their ability to integrate them with intelligent control systems. This is exactly the versatility that you will get from this course.

Mechatronics is the only discipline of engineering that gives you such versatility. This course begins by giving you a solid foundation in fundamental engineering knowledge and skills, which will then expand into areas such as automation, robotics, mechatronics design, programmable logic controllers, electromechanical, pneumatics, vision systems, computer numerical control, sensors integration, microcontroller programming, control engineering and aerospace engineering.

In your final year, you are offered a wide choice of elective subjects. The subjects are categorised into three Elective Clusters involving key areas of technology: Aerospace Systems, Process Control & Automation, and Robotics. By applying these knowledge and skills in product design and automation processes, Mechatronics gives you the flexibility to work in a wide range

of high-value industries such as aerospace, automation, clean room, manufacturing, medical, robotics, R&D support and wafer fabrication.



This course equips you with the fundamental knowledge and skill in integrating mechanical and electronics using computer control, so that you will definitely be well prepared to establish a career in today's modern industry. I can confidently say that, by graduating from this course, huge opportunities for success are open to you.

Robson Tan
Managing Director
NICA Trading & Industrial Supplies

Career Opportunities

The opportunities and benefits to be gained from designing smart products and automated systems are huge, and will continue to grow rapidly in the coming years. You will excel in a wide spectrum of industries as diverse as electronics, manufacturing, food processing, pharmaceuticals, chemicals and aerospace. You may also choose to do R&D work, equipment design and development, planning, project management, as well as technical sales and marketing, qualifying you to work in high-tech manufacturing environments and the growing petrochemical industry. Your diploma will also enable you to take up local and overseas degree programmes in electronic, mechanical, aerospace or computer engineering.

Graduation Requirements

Cumulative Grade Point Average	: min 1.0
TP Core Subjects	: 19 credit units
Diploma Subjects	
Core Subjects	: 92 credit units
Option / Elective Subjects	: 11 credit units
Cross-Disciplinary Subjects	: min 9 credit units
Total Credit Units Completed	: min 131 credit units

Course Structure

TP CORE SUBJECTS				
SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS	
ECS1003	Writing & Oral Presentation	1	2	
ECS1004	Introduction to Effective Communication	1	2	
LEA1001	Leadership: Essential Attributes & Practice 1	1	1	
LEA1002	Leadership: Essential Attributes & Practice 2	1	1	
LEA1003	Leadership: Essential Attributes & Practice 3	1	1	
ECS2003	Organisational Communication	2	2	
ESI2001	Student Internship Programme	2	8	
ECS3002	Career Communication	3	2	

Application

Apply during the Joint Admissions Exercise following the release of the GCE O Level results. For other categories of local applicants, please refer to the section on “Admission and Requirements”. For international students, please refer to the section on “Information for International Students”.

Minimum Entry Requirements

5 GCE O Level subjects comprising:	
English Language (EL1)*	Grades 1 - 7
Mathematics (E or A)	Grades 1 - 6
Any one of the following subjects^	Grades 1 - 6
Any two other subjects, excluding CCA	-

^ Biology, Biotechnology, Chemistry, Combined Science, Design & Technology, Engineering Science, Physical Science, Physics, Science (Chemistry, Biology), Science (Physics, Biology), Science (Physics, Chemistry).

Note: Applicants should not be suffering from severe colour vision deficiency, uncontrolled epilepsy, profound hearing loss or severe vision impairment.

** SPM / UEC holders must have a minimum of grade 6 for the Bahasa Inggeris (English Language) subject.*

DIPLOMA SUBJECTS – CORE SUBJECTS

SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS
EDR1003	Engineering Drawing	1	4
EED1001	Electronic Prototyping	1	3
EEE1001	Circuit Analysis	1	6
EEE1002	Electronic Devices & Circuits	1	6
EEE1003	Digital Fundamentals 1	1	5
EEE1004	Digital Fundamentals 2	1	5
EMA1001	Engineering Mathematics 1	1	5
EMA1002	Engineering Mathematics 2	1	4
EME1002	Statics & Strength of Materials	1	4
ESC1002	Engineering Physics	1	4
ESE1006	Computer Programming for Problem Solving	1	4
EED2007	Mechatronics Design Project	2	4
EMA2001	Engineering Mathematics 3	2	5
EMC2001	Microcontroller Technology	2	5
EME2004	Programmable Automation	2	4
EME2007	Machining Technology	2	4
EME2008	Principles of Dynamics	2	5
EME2011	Engineering Design	2	3
EMP3001	Major Project	3	12

DIPLOMA SUBJECTS – CLUSTER ELECTIVE SUBJECTS

SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS
<u>Process Control & Automation</u>			
ECT2001	Circuits & Control Systems	2	5
ECT2004	Instrumentation & Computer Control	2	4
EMF3004	Automation & Machine Vision	3	4
<u>Robotics</u>			
ECT3002	Analytical Robotics	3	4
ECT3003	Robotic Control Systems	3	4
EMC3004	Data Acquisition Systems	3	4
<u>Aerospace Systems</u>			
EME2006	Engineering Materials	2	4
EAE3008	Gas Turbine Engine	3	4
EAE3016	Aircraft Aerodynamics & Systems	3	3

DIPLOMA SUBJECTS – SPECIAL ELECTIVES

You can opt to take Special Electives when offered. These optional subjects, taken in addition to the diploma cluster elective subjects, will stretch your potential and help you to meet your aspirations.

SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS
EED3009	Special Project 1	3	2
EED3010	Special Project 2	3	2
EED3011	Higher Engineering Skills 1	3	2
EED3012	Higher Engineering Skills 2	3	2
EMA3001	Higher Engineering Mathematics	3	4

CROSS-DISCIPLINARY SUBJECTS

Students are required to obtain a minimum of 9 credit units from the list of Cross-Disciplinary Subjects.

Microelectronics



Want to know why Singapore is nicknamed “Silicon Island of the East” and what this means to you in terms of career prospects and opportunities? Our Diploma in Microelectronics will help you to answer this important question!

Microelectronics is about the design and fabrication of extremely tiny circuits or gadgets in the form of integrated circuits(IC), micro-sensors, and micro-devices such as microprocessors, flash memory drives, SD cards, SIM cards, and surgical micro-robots. This technology empowers most of today’s cutting-edge smart devices such as tablets, mobile phones and HD TVs and they push the boundaries of exciting mobile apps and games.

In this course, you will enrol through either the Electrical & Electronic Engineering (EEE) Programme or Common Engineering Programme (CEP) and go through a common first year. From your second year onwards, you will specialise in Microelectronics and enjoy the privilege of using our comprehensive IC manufacturing facilities such as our Class 100 Cleanroom, industrial grade IC Design Software and IC Test Systems. You will be equipped with specialised knowledge and skills that will give you a distinct advantage when you pursue exciting careers in the

Microelectronics field in Singapore, which is home to more than 50 semiconductor companies.



You have equipped your students well with the basic knowledge and skills needed for the semiconductor sector. From our experience of working with students from this diploma course, we have found them to be confident, competent, and ready to meet the challenges of the dynamic microelectronics industry.

Mdm Toh Geok Tin
Senior Layout Design Manager
Marvell Asia Pte Ltd

Career Opportunities

You will be equipped with technical skills in the use of electronics and microelectronics-related equipment, as well as analogue and digital systems. These skills will be your springboard to exciting careers with good starting salaries in multi-billion dollar wafer fabrication plants, IC chip assembly and test companies, IC chip design centres as well as research centres and manufacturers of today's high-tech smart devices. Job prospects are attractive and diverse, covering design, technical support, manufacturing, sales and marketing, as well as service and maintenance.

Graduation Requirements

Cumulative Grade Point Average	: min 1.0
TP Core Subjects	: 19 credit units
Diploma Core Subjects	: 104 credit units
Cross-Disciplinary Subjects	: min 9 credit units
Total Credit Units Completed	: min 132 credit units

Course Structure

TP CORE SUBJECTS				
SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS	
ECS1003	Writing & Oral Presentation	1	2	
ECS1004	Introduction to Effective Communication	1	2	
LEA1001	Leadership: Essential Attributes & Practice 1	1	1	
LEA1002	Leadership: Essential Attributes & Practice 2	1	1	
LEA1003	Leadership: Essential Attributes & Practice 3	1	1	
ECS2003	Organisational Communication	2	2	
ESI2001	Student Internship Programme	2	8	
ECS3002	Career Communication	3	2	

Application

Apply during the Joint Admissions Exercise following the release of the GCE O Level results. For other categories of local applicants, please refer to the section on "Admission and Requirements". For international students, please refer to the section on "Information for International Students".

Minimum Entry Requirements

5 GCE O Level subjects comprising:	
English Language (EL1)*	Grades 1 - 7
Mathematics (E or A)	Grades 1 - 6
Any one of the following subjects^	Grades 1 - 6
Any two other subjects, excluding CCA	-

^ Biology, Biotechnology, Chemistry, Combined Science, Design & Technology, Engineering Science, Physical Science, Physics, Science (Chemistry, Biology), Science (Physics, Biology), Science (Physics, Chemistry).

Note: Applicants should not be suffering from severe colour vision deficiency, uncontrolled epilepsy, profound hearing loss or severe vision impairment.

** SPM / UEC holders must have a minimum of grade 6 for the Bahasa Inggeris (English Language) subject.*

DIPLOMA SUBJECTS – CORE SUBJECTS

SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS
EED1001	Electronic Prototyping	1	3
EEE1001	Circuit Analysis	1	6
EEE1002	Electronic Devices & Circuits	1	6
EEE1003	Digital Fundamentals 1	1	5
EEE1004	Digital Fundamentals 2	1	5
EMA1001	Engineering Mathematics 1	1	5
EMA1002	Engineering Mathematics 2	1	4
ESC1002	Engineering Physics	1	4
ESE1006	Computer Programming for Problem Solving	1	4
ECT2001	Circuits & Control Systems	2	5
EEE2001	Integrated Circuit Applications	2	4
EMA2001	Engineering Mathematics 3	2	5
EMC2001	Microcontroller Technology	2	5
EMI2001	Semiconductor Physics & Devices	2	4
EMI2002	Wafer Fabrication Process Technology	2	5
EMI2005	IC Packaging & Failure Analysis	2	4
EMI2008	IC Process Integration	2	4
EMI2009	IC Layout Design	2	5
EMI3001	Microelectronics Test & Measurement	3	5
EMI3005	Cleanroom Equipment & Technology	3	4
EMP3001	Major Project	3	12

DIPLOMA SUBJECTS – SPECIAL ELECTIVES

You can opt to take Special Electives when offered. These optional subjects, taken in addition to the diploma elective subjects, will stretch your potential and help you to meet your aspirations.

SUBJECT CODE	SUBJECT	LEVEL	CREDIT UNITS
EED3009	Special Project 1	3	2
EED3010	Special Project 2	3	2
EED3011	Higher Engineering Skills 1	3	2
EED3012	Higher Engineering Skills 2	3	2
EMA3001	Higher Engineering Mathematics	3	4

CROSS-DISCIPLINARY SUBJECTS

Students are required to obtain a minimum of 9 credit units from the list of Cross-Disciplinary Subjects.

Special Programmes



The School of Engineering also offers three special common gateway programmes which allow you to decide on the course to take only after one or two semesters. You will graduate with the same diploma as students who had enrolled for a particular course right from the start.

Common Engineering Programme

This is a single gateway to 8 different engineering diploma courses, which gives you extreme flexibility. You do a common first year, and choose your diploma course only in your second year, so that you have more time to find out your strengths and interests before deciding. So if you are undecided on the engineering course to take, this flexible programme would suit you.

You may choose from these 8 diploma courses:

- Aerospace Electronics
- Aerospace Engineering
- Biomedical Engineering
- Clean Energy
- Computer Engineering
- Electronics
- Mechatronics
- Microelectronics

Electrical & Electronic Engineering (EEE) Programme

You will do a common first year, and then, after observing the economy and industry trends, choose one out of the four EEE-related courses to do from your second year onwards. All four programmes will gear you ideally for further studies in EEE-related degree courses at local and overseas universities.

You may choose from these 4 diploma courses:

- Aerospace Electronics
- Electronics
- Computer Engineering
- Microelectronics

Mechatronics & Aerospace Programme

You will branch into either the Mechatronics or Aerospace Engineering course in your second semester. Since these two fields are closely-related, you will be well positioned to keep your options open. You also get a second chance to enter the highly-popular Aerospace Engineering course using your first semester polytechnic results.

Application

Apply during the Joint Admissions Exercise following the release of the GCE O Level results. For other categories of local applicants, please refer to the section on “Admission and Requirements”. For international students, please refer to the section on “Information for International Students”.

Do note that you will take the same three years to complete your course, and upon graduation, you will receive the same diploma as your peers who had enrolled for a particular course right from the start.

Minimum Entry Requirements

5 GCE O Level subjects comprising:	
English Language (EL1)*	Grades 1 - 7
Mathematics (E or A)	Grades 1 - 6
Any one of the following subjects^	Grades 1 - 6
Any two other subjects, excluding CCA	-

^ Biology, Biotechnology, Chemistry, Combined Science, Design & Technology, Engineering Science, Physical Science, Physics, Science (Chemistry, Biology), Science (Physics, Biology), Science (Physics, Chemistry).

** SPM / UEC holders must have a minimum of grade 6 for the Bahasa Inggeris (English Language) subject.*

Note: Any special entry requirements for a specific diploma course, such as health status, will also apply if you choose to branch into that course.

Subject Synopses

BHT1010 Introduction to Hospitality & Tourism

This subject provides an overview of the multi-faceted nature of the hospitality and tourism industry. You will gain an insight into how the key sectors are organised and structured and how they relate to each other as an industry. The concept of tourism demands and tourism consumer behaviour will be introduced. Lastly, you will explore trends, issues and challenges facing the industry.

BHT2003 Club & Resort Business

This subject covers the various definitions and classifications of club and resort business, resort planning and development, as well as operations and marketing of clubs and resorts. It gives you an appreciation of the operational challenges faced by clubs and resorts.

BHT2005 Event Management

This subject introduces the scope of events and their application in the context of the tourism industry. From this macro perspective, you will build a foundation in event conceptualisation, development and production, covering topics such as marketing of events, human resource management and budgeting, and staging.

DNG1342 Drawing Essentials

This subject introduces the basics of sketching and drawing techniques. A primary component of this module is to understand the importance of proportion in drawing and the effect of light and its different tones on various surfaces.

DNG1344 3D Art Fundamentals

This subject introduces the fundamentals of art through a variety of 3D techniques and media. It focuses on inculcating visual and observational skills through the tactile qualities in texture and form by feeling and working with different 3D materials.

DNG1345 Ideation

This subject introduces you to some idea generation, analysis and synthesis techniques within a problem-solving framework. Through these techniques, you will explore and develop fluidity of thought as well as an analytical mind. This subject introduces visual literacy through which you develop your personal visual language to communicate a great variety of concepts. You will also develop and demonstrate your aesthetic awareness and design sensibility.

DNG2371 Interface Design

This subject introduces the basic principles of graphic user interface (GUI) and user experience design. It focuses on the basic rules of visual information organisation and hierarchy, and explores the process of navigation on screen. It also examines the choice of appropriate styles and graphic treatment for the intended audience, and the use of conceptual models for creating appropriate user experience.

EAD1001 Introduction to Civil Aviation

This module provides an overview of the aviation industry and introduces the key concepts and interaction of components in the aviation system including airports, airlines, supporting organisations and civil aviation authorities. It covers the role of key players in the aviation industry as well as aviation economics and legislation.

EAE1002 Aircraft Electrical Fundamentals

This subject provides you with broad-based knowledge on electrical theories, components and devices. It also covers electrical machines. In addition, you will be equipped with the knowledge that is expected under the Singapore Airworthiness Requirements (SAR66), so that you will be competent in getting your aircraft maintenance certification later on.

EAE1004 Fundamentals of Aeronautical Science

This subject gives a broad overview of the basic concepts involved in aeronautical science. Beginning with units for different quantities, it covers mechanical forces, principles of moments, stress and strain, properties of solids, fluids and gases, simple harmonic motion, momentum and energy, gyroscopic principles, viscosity and compressibility, heat capacity and heat transfer, laws of thermodynamics, latent heat, principles of light, lenses and mirrors, and fibre optics. Transverse and longitudinal waves, intensity and pitch of sound, and vibrating strings and pipes are also included. The syllabus is tailored to follow all topics from the Singapore Airworthiness Requirements (SAR-66) on Physics (Module M2).

EAE1006 Avionic Systems

This subject gives a broad overview of aircraft avionics and architecture at the system level, and provides a context for follow-on training. It introduces you to the key avionics deployed on-board an air transport aircraft, including the crew information systems, the safety and surveillance systems, the flight and engine control systems, the electrical power system, the navigation systems as well as the communications and information systems.

EAE1008 Aircraft Electronics & Digital Systems

This subject covers the basics of semiconductors, printed circuit boards, servomechanisms, electronic instrument systems, logic circuits, fibre optics, electronic displays, electronic sensitive devices, electromagnetic environment and digital aircraft systems. The depth of coverage will adhere to the requirement of SAR-66 (Category B1) for M4 – Electronic Fundamentals and M5 - Digital Techniques/ Electronic Instrument Systems.

EAE2002 Aviation Legislation & Human Factors

This subject provides basic knowledge and understanding of aviation legislation and human factors for novice engineers studying for their Singapore Airworthiness Requirements (SAR-66) aircraft maintenance licences. Knowledge of this subject has a significant impact on the safety standards and responsibilities expected of the holder of an aircraft maintenance licence.

EAE2003 Aircraft Electronics & Servomechanisms

This subject provides you with broad-based knowledge in the theory and operation of semiconductor diodes, printed circuit boards, transistors, integrated circuits and feedback control systems. You will also be trained to identify typical synchro issues encountered in servomechanisms. In addition, you will be equipped with the required knowledge in SAR-66 so that they can be competent to get certified in aircraft maintenance.

EAE3006 Radio Fundamentals & Navigation Systems

This subject introduces basic concepts of radio theory and navigation systems. Radio theory includes Transmission Line Theory, Radio Frequency Propagation and Antenna Theory, as well as modern communication systems such as transmitters and receivers operation and different modulation techniques. Navigation systems cover fundamentals of communication systems used in aircraft communication, including intra-aircraft communication. System and subsystem level coverage of different navigation systems such as Inertial Navigation System (INS), Global Positioning System (GPS), Automatic Direction Finder (ADF) and Distance Measuring Equipment (DME) are included. Basic concepts and operation of different landing systems such as Instrument Landing System (ILS) and Microwave Landing System (MLS) will be discussed. Fundamentals of RADAR and its application in weather detection and Air Traffic Control transponder are also emphasised.

EAE3008 Gas Turbine Engine

This subject equips you with basic technical knowledge of aircraft propulsion methods, thermodynamic cycles, combustion, gas turbine engines, effects of atmospheric variations (temperature, density, pressure altitude) on engine auxiliary systems (such as fuel system, lubrication system, ignition, starting, fire protection and auxiliary power unit), and current developments in propulsion systems. The syllabus is aligned with the Singapore Airworthiness Requirements (SAR- 66) Module M15 on Gas Turbine Engine.

EAE3009 Basic Aerodynamics

This subject introduces the principles of aerodynamics and flight controls. It is designed to give a good balance between theoretical knowledge with applications using classroom lessons, wind tunnel and computational fluid dynamics experiments. The syllabus includes all topics in the Singapore Airworthiness Requirements (SAR-66) Module M08 on Basic Aerodynamics.

EAE3011 Aircraft Structures & Flight Control

This subject covers the theory of flight through aeroplane aerodynamics and flight controls. The fundamentals of aircraft structures, automatic flight control, its working principles and automatic landing systems will be discussed in detail.

EAE3012 Aircraft Test & Measurement

This subject introduces the common practices in test and measurement procedures and methodologies in the avionics industry. This includes learning the functions of various types of low-frequency and radio-frequency equipment used in testing. The principles and techniques of performing various types of measurements will be covered in details. Equipment calibration and traceability concepts will also be introduced.

EAE3013 Higher Aerospace Training

This subject allows you to work in Singapore Airworthiness Requirements – Part 145 Approved Maintenance Organisations, Part 147 Approved Maintenance Training Organisations or equivalent organisations. You may work on special industrial collaboration projects or embark on student exchange programmes with universities or tertiary institutions relevant to the aerospace industry. You may also represent our Polytechnic in competitions or participate in specialised training programmes relevant to the aerospace industry. The on-the-job training nature of this programme will provide opportunities for you to apply engineering concepts and skills to solve problems.

EAE3015 Aircraft Structures & Composites

This subject covers the general knowledge of airframe structures and their construction methods. Topics include structural strength, construction of typical airframe structures, methods of surface protection and structural assembly techniques. An introduction to composites and their fabrication and repair methods will also be covered.

EAE3016 Aircraft Aerodynamics & Systems

The subject covers the fundamental principles of aircraft aerodynamics, and various on-board systems of an aircraft such as flight control system, hydraulic system, landing gear system, fuel system, environmental system, and electrical system.

EAE3017 Engine Control & Instrumentations

This subject will introduce the aircraft instrument terminology and the devices used to measure pressure, temperature and rotational speed. It will also give you a good understanding of the principles and operations of the basic air data instruments, engine indicating instruments and the full authority digital engine control (FADEC) system. The subject will also include the operation of the pitot-static system, the compasses and gyroscopes, the air data computer, and the various instrument systems such as the engine indication crew alerting system (EICAS) and the electronic centralised aircraft monitor (ECAM) system.

EAE3018 Aircraft Digital Systems

This subject covers the general knowledge of the theoretical and practical aspects of aircraft digital fundamentals. This involves understanding and the ability to apply this knowledge in the area of electronic instrument systems, logic circuits, fibre optics, aircraft data buses, electronic displays, electronic sensitive devices, electromagnetic environment and digital aircraft systems as required by Singapore Airworthiness Requirements (SAR-66) of the Civil Aviation Authority of Singapore.

EAE3019 Aircraft Engine Maintenance Practices

The subject provides basic knowledge and understanding of aircraft engine operations and maintenance for new engineers who are studying for their Singapore Airworthiness Requirements SAR-66 aircraft maintenance licences. It covers topics such as engine receive-in, engine components removal and installation, engine components inspection, engine assembly and disassembly, rig and de-rig engine for testing, and engine components surface treatments. The syllabus is aligned with the Singapore Airworthiness Requirements (SAR-66) Module M15 on Gas Turbine Engine and the Workforce Skills Qualifications (WSQ) competency standard.

EAL1001 Principles of Aeronautical Science

This subject provides you with a basic understanding of the fundamentals of flight. Topics covered include the theory of flight, elements of air navigation, aircraft systems and performance, flight physiology, aviation regulations and safety, aircraft types and performance, as well as an overview of careers as commercial pilots.

EAL1003 Airline Operations

The subject covers the fundamentals of airline operations. Topics covered include ground operations such as handling of passengers, baggage, cargo, as well as ramp handling services, airside management, aircraft engineering and maintenance. Other topics include airline flight operations such as flight control centre, flight crew and cabin crew scheduling, flight procedures and requirements, airline operational efficiency and punctuality.

EAL2005 Airline Management

This subject covers the fundamentals of airline business and management. The contents include airline business models, key airline performance indicators, airline marketing, airline route and network development and airline administration. Other topics covered include management of airline profitability using airline simulation and SWOT analysis.

EAL3004 Management for Air Cargo

The subject provides a basic understanding of the fundamentals of air freight and cargo management. Topics covered include the importance of air cargo to the economy, cargo rates and tariffs issues, terminal facilities and work flow for cargo operations, as well as forecasts and future trends of the cargo industry.

EAL3005 Air Navigation

This subject provides a basic understanding of air navigation. Topics covered include chart projections, time datum, altimetry, operating principles of navigational aids and the use of navigation computer for various speed and wind calculations.

EAL3006 Flight Planning

This subject introduces flight planning and monitoring for flight operations of Single Engine Piston Aeroplane (SEP), Multi-Engine Piston Aeroplane (MEP), as well as planning and special considerations for Medium Range Jet Transport (MRJT). Topics covered will include radio navigation, navigational aids and services, aeronautical information publications, Notices to Airmen (NOTAM), topographical charts, weather charts, point of no return/point of safe return (PNR/PSR), Critical Point (CP) or Equal Time Point (ETP), airways, miscellaneous charts, ATC flight plan, abbreviations used and operational procedures.

EAM1001 Airport Operations & Management

This subject introduces the fundamentals, concepts and principles involved in the operations and management of modern international airports. Topics covered include an overview of key players in terminal operations. It also delves into the operational aspect of landside / airside operations, terminal operations, way-finding and signage systems as well as airport contingency planning. An overview of future trends and challenges facing airport operations will also be covered.

EAM2007 Aviation Safety & Security

This subject covers aviation security and safety issues related to airport operations and safety. Topics and issues regarding security threats, safety hazards and human error in aviation within the management framework of security and safety risk management will also be covered.

EAM3002 Airport Administration

This subject introduces the fundamental concepts and principles involved in the organisational, political and financial administration of modern international airports. Topics covered include human resource, airport performance, airport commercial management, public relations, corporate/ business planning and airport finance. An overview of the various airport ownership models is also given.

EAM3003 Meteorological Studies

This subject introduces the concept of meteorology that is required in flight operations. Meteorological concepts such as the Earth's atmosphere, pressure, density, synoptic charts, pressure systems, altimetry, temperature, humidity, adiabatic and stability, turbulence and low and upper winds from of the Earth are discussed in detail. In addition, clouds, cloud formation and precipitation, thunderstorms, visibility, icing, documentation, weather charts, air masses, occlusions, other depressions, global climatology, surface winds, general weather, area climatology, route climatology and satellite observations are also covered.

EAT2006 Airport Systems

This subject provides an overview of the key facilities and systems in both the landside and airside of an airport. Landside topics include Passenger Check-in Systems, Flight Information Display Systems (FIDS), fully automated Baggage Handling System, People Mover System (PMS) and Passenger Loading Bridge System. On the airside, topics covered include the types of aircraft pavements, the causes of wear and tear of aircraft pavements, methods of assessing the condition of aircraft pavements, the programming of maintenance works and techniques of repairs and their compliance to international operational standards and requirements.

EAT2007 Airfield Systems

The subject provides a basic understanding of the airfield systems used in the aviation industry, mainly by Air Traffic Service and other supporting units. Topics covered include aeronautical telecommunications, functions of air and ground radar systems, multi-surveillance tracking systems, aerodrome approach aid and requirement of the various categories, aerodrome ground aid, automatic dependent surveillance and controller-pilot data link communication.

EAT3001 Air Traffic Management

The subject provides an overview of how Air Traffic Service functions as an operational unit and a basic understanding of the theoretical and practical skills required in Air Traffic Management. Topics covered include the fundamentals of air traffic management, aerodrome control, approach radar and non-radar control, area radar and non-radar control, emergency procedures and future developments in air traffic management.

EBD1003 Computer-Aided Design & Space Planning

This subject introduces space planning methodology with computer-aided design (CAD) as design tools. You will learn space utilisation in variety of building types and facility planning based on current building codes. You will also use CAD software to produce two-dimensional (2D) and three-dimensional (3D) drawings.

EBD2005 Security & Surveillance

This subject gives an overview of security and surveillance, including the entire process of their design and integration. The main emphasis is placed on applying scientific and engineering principles for the design of the system and the use of component performance measures to establish the effectiveness of such systems when applied across various business sectors.

EBD2008 Building Information Modelling

This subject emphasises the application of Building Information Modelling (BIM) to conceptualise and develop building designs that meets the intended objectives. You will learn about the BIM processes from conceptualisation stage to design, visualisation and simulation, and the application of BIM in integrating and coordinating the digitised models for architectural, mechanical and electrical systems.

EBI2001 Introduction to Bioinformatics

This subject covers basic bioinformatics concepts, tools and applications. It introduces the organisation and use of biological databases, computational methods and algorithms in genome analysis. It also includes topics such as pairwise and multiple sequence alignment techniques, and the construction of evolutionary phylogenetic relationships between biological species.

EBI3001 Biostatistics

This subject covers probability concepts and statistical techniques that can be applied to solve biological problems in the biomedical sciences and to facilitate decision-making processes, especially in clinical trials and experimental studies that involve human subjects. Topics include the basics of probability probability distributions and descriptive statistics, estimation of statistical parameters, confidence intervals, analysis of means (ANOM), analysis of variances (ANOVA), hypothesis testing, and correlation cum regression techniques.

EBI3003 Medical Imaging & Visualisation

This subject provides you with the underlying physical principles of instrumentation, imaging methodology and applications of the five major medical imaging modalities used in hospitals and clinics. These include ultrasound imaging, X-ray imaging, computed tomography, nuclear medicine imaging and magnetic resonance imaging. It also covers the fundamentals of image representation, image visualisation and digital image processing which you will apply to process and analyze medical images.

EBI3004 Audiometry & Hearing Devices

This subject focuses on the hearing health sector in biomedicine. It exposes you to the science of hearing assessment and technologies available to remediate hearing loss. You will study the properties of sound, the physiology of hearing and the causes of hearing impairment. The subject will equip you with the skills to screen for hearing impairment. You will also learn about the underlying technologies behind digital hearing aids.

EBM1002 Real Estate Business

This subject covers the knowledge in real estate business, which includes land, buildings and facilities. You will learn all aspects of the real estate business which includes the legal systems, economics, urban planning, valuation and investment, marketing and management.

EBM2004 Project Management

This subject aims to provide an overview of the principles and concepts in project management and equip you with the theoretical foundation and skills in using project management tools. It emphasises the knowledge and practices which are widely applied in project management. Topics covered include the project management framework, project management processes and project management knowledge areas.

EBM2005 Fire & Life Safety Management

This subject introduces the roles and responsibilities of a Fire Safety Manager for both commercial buildings and industrial premises. You will be exposed to the procedure adopted in running a fire command centre, the use of detection, protection and control systems, fire investigation and formulation of a fire emergency plan.

EBM2006 Building Management Systems

This subject covers the fundamental knowledge required in the design and operation of a Building Management System (BMS). The concept of controls and monitoring with sensors and Direct Digital Controllers will be introduced. The roles of BMS in building controls, facility management and energy management will also be covered.

EBM3004 Business Continuity Management

This subject introduces the concepts and trends in the design, development, implementation and management of business continuity. Beginning with an introduction of Business Continuity Management (BCM), it delves into analysing business risk and impact, and evaluating BCM strategies and plans. Emergency response and crisis management plans and the coordination with external agencies are also discussed.

EBM3005 Energy Management & Audit

This subject covers two main areas: energy management and energy audit. For the former, the subject illustrates the intrinsic value and concept of energy management as well as the considerations and steps involved in implementation. For Energy Audit, the emphasis is on the method and procedure in auditing energy efficiency and evaluating the energy performance of buildings and its subsystems. These will include the use of energy performance benchmarks and a comparison with acceptable practices and prevailing codes and regulations. Finally, the subject discusses how the life-cycle-cost concept is used to evaluate the economic viability of any proposal to improve energy performance.

EBS1002 Human Anatomy & Physiology

This subject provides you with a basic understanding of human anatomy and physiology. Topics covered include the anatomy of the organs and organ systems and their functions.

EBS1003 Biochemistry

This subject investigates the constituents of biological systems, their properties and their significance to biological science. This will extend to provide further understanding in the functions and analyses of carbohydrates, lipids, proteins and enzymes and protein synthesis and information pathways. The coordination between catabolism and anabolism as a foundation to develop deeper understanding of metabolism and their dysfunctions is also covered.

EBS2002 Molecular Genetics

This subject covers both the theoretical knowledge and practical techniques of molecular genetics using the E.coli system as a model. Topics covered include DNA structure, DNA replication, DNA transcription and translation as well as DNA mutations. You will also be introduced to the different types of operons and will study how these are regulated.

EBS3003 Clinical Laboratory Equipment

This subject provides you with an understanding of the equipment widely used in clinical laboratories. Topics covered include the principles and applications of commonly-used clinical laboratory equipment. Essential insights on clinical laboratory practices are also covered.

EBT1003 Facilities Operations & Maintenance

You will learn about air-conditioning and ventilation, cold water distribution systems, electrical installations, lifts and escalators - all of which are the key systems in facilities operations. You will discover how these are important in the management and maintenance of a facility, as they enable effective operation and better business performance, thus leading to a higher work satisfaction and increased productivity among employees.

EBZ1001 Business Fundamentals

This subject provides you with an overall view pertaining to the four pillars of business: Management, Marketing, Money and Manpower. Introductory topics correlating to the four pillars of operation - Management Fundamentals, Marketing Principles, Financial Statements and Organisation Behaviour, will be taught.

EBZ1002 Principles of Economics

This subject provides you with a broad introduction to the theoretical knowledge and application of the key principles of economics and the related economic behaviour in the business environment within the Singapore economy. Some of the key principles and theories include supply and demand, market structures, GDP measurement, aggregate demand and aggregate supply and macroeconomic policies.

EBZ2002 Marketing Intelligence

This subject provides an overview of the role of marketing intelligence in decision making processes. It covers the methodologies in marketing intelligence and the use of timely and accurate information for making vital and sound business decisions.

EBZ2003 Engineering Economy

This subject provides a basic understanding of the economic aspects of engineering applications, elements of costs and costing methods, and the relationship between cost behaviour and profit. You will be expected to analyse different investment alternatives for economic decision making. The subject also discusses using EVA (Economic Value Added) to measure business performance.

EBZ2005 Marketing Concepts & Strategies

With technology moving at warp speed, all things are possible. Understanding market needs and the discerning customers are now the fundamental basis for building technology-based product and services. This subject emphasises the marketing of technology-based products and services and the use of technology in marketing. It covers an introduction to marketing, analysis of the marketing environment, marketing research, target marketing, application of the marketing mix, and use of the internet and other technologies to achieve marketing goals.

EBZ2006 Service Quality & Management

This subject introduces the key concepts and principles of Service Quality and Management. Topics covered include concepts of quality services, essential skills in customer services, principles and strategy of service management, methods for service quality measurements and service recovery.

EBZ3008 Technopreneurship

This subject covers the basic fields of technopreneurship. It examines the traits of successful technopreneurs and the basic start-up of new businesses. Through project work, you have the opportunity to conduct field research, identify, evaluate and select viable businesses, and then develop feasible business plans applying the knowledge and tools covered in different topics such as marketing, customer orientation, pricing, communication, financial judgement, managerial importance, service orientation and competitive strategies.

ECA3002 Virtual Reality

This subject emphasises the importance of virtual prototyping in manufacturing and e-commerce applications. You will be taught three main areas: modelling, behaviour programming and display systems. You will work on a 3D web page which incorporates an interactive virtual world, standard HTML, text, sound, animation and graphics.

ECA3003 3D Modelling

This subject equips you with different techniques and strategies to model 3D objects and generate 2D drawings using Computer- Aided Design software. Fundamental knowledge of solid modelling and creating of proper product drawings will be covered. You will also master the skills of creating assembly models, which will be used in the last part of the course to generate product assembly animation and realistic product rendering.

ECC1002 Networking Fundamentals

This subject covers the fundamental principles of data communications essential for the understanding of computer networking. It includes the basic knowledge of data transmission, the Open Systems Interconnection (OSI) model, as well as local area network protocols and technologies.

ECC2010 Mobile Device Applications Development

This subject covers the development of applications on mobile and wireless computing platforms. It provides an overview of mobile applications, its importance and benefits. It introduces the technologies and methodologies for their development. This includes the architectures, frameworks, standards, programming languages, design process and tools.

ECC2012 Network Infrastructure Technologies

This subject covers the basic theories of routing and switching and their applications in a networking environment. It focuses on IP addressing scheme, routing protocols, basic access control lists, switching architectures and operation of a Wide Area Network (WAN). It provides opportunities for you to interconnect networks separated over large geographical area.

ECC3009 Network Integration

This subject covers networking technologies used in the design and implementation of large scale networks. Advanced Internet Protocol (IP) address management and optimisation techniques are utilised in the scalable routed and switched networks. Simple security tools are introduced to control the flow of network traffic. Next generation Internet Protocol version 6 (IPv6), which will replace the version 4 in future, will be incorporated to deal with the increasing demand for dedicated IP addresses.

ECC3010 Network Security System

This subject highlights the security risks commonly encountered by computer networks in a small or medium sized business (SME) environment. It covers the concepts and implementation of network security tools such as Authentication, Authorisation and Accounting (AAA), firewall, Virtual Private Network (VPN) and network device hardening, which mitigate the security threats to most computer networks in SMEs.

ECE2001 Energy Conversion & Storage Systems

This subject introduces the different energy conversion processes that can be used to harness energy from primary sources such as wind and biofuels, and to convert them into more convenient secondary energy forms, such as electrical energy. The different types of storage systems, such as rechargeable batteries, flywheel systems, and ultra-capacitors, as well as their characteristics and applications will also be covered.

ECE2003 Fuel Cell Design & Testing

This subject presents fuel cell system descriptions and their designs. It covers the details of fuel cell component materials, fuel cell design, their construction methods and fuel cell system control associated with their balance of plant (BOP). It also includes the introduction of analytical instruments for characterisation of the component material properties, fuel cell operation and analysis of fuel cell system.

ECE2005 Fundamentals of Clean Energy

This subject focuses on harnessing of energy from clean and renewable sources such as solar power, water, biomass and wind, using efficient technologies. The physical processes behind the clean energy technologies will be covered. The environmental impacts from using energy and the available mitigation tools will also be discussed.

ECE2006 Solar Cell & System

This subject introduces the operating principles, design, fabrication and application of solar cells. Topics include semiconductor properties, p-n junction diodes, solar cell design and fabrication processes, solar cell and panel characteristics and solar photovoltaic (PV) system design and installation. The emphasis will be on standalone and grid-connected PV power generation systems.

ECE3001 Clean Energy Process Integration

This subject provides an integration of the various clean energy manufacturing processes. It covers the use of technologies and techniques to enhance energy efficiency in manufacturing plants. The system integration of different clean energy sources will be introduced. Other technical aspects such as data acquisition, smart metering and micro-grid will also be covered.

ECE3003 Energy Efficiency & Efficient Drive

This subject covers the energy efficiency in different types of facilities and the optimisation of motor driven system to save energy. Beginning with the fundamental operating principles of AC and DC motors, factors influencing energy efficiency in energy intensive applications such as boiler, furnace, turbine and compressors are covered. Energy efficiency analysis and computation, as well as energy saving features in buildings and power generation will be introduced.

ECS1003 Writing & Oral Presentation

In this subject, you will acquire technical writing and oral presentation skills. You will learn how to write and organise technical reports and how to prepare a speech using techniques to deliver an effective speech that holds the attention of your audience. You are expected to conduct research to gather information and widen your perspectives for both the report and oral presentation.

ECS1004 Introduction to Effective Communication

This subject introduces the basic skills needed for technical communication in the areas of listening, reading, speaking, writing and research. You will learn to recognise the organisational structure, style and content of formal spoken and written engineering texts. You will also learn to write sentence structures commonly found in engineering texts. In addition, you will learn to produce the linguistic features of spoken Standard English. The subject also introduces the skill of using library resources for research purposes.

ECS2002 Engineering Business Communication

This subject covers the major elements of successful communication in an engineering-related business domain. It deals primarily with the written and spoken language skills involved in presenting, publicising and promoting an engineering product or service. The subject also covers the functions and requirements of the different media that are used in the communication process. Thus you will work on different communicative activities to apply the tools and strategies of integrated marketing communication.

ECS2003 Organisational Communication

This subject prepares you for written and spoken communication in the world of work, focusing on intra- and inter-organisational communication. Group communication is also emphasised to enhance your sensitivity in communication situations and your awareness of communication dynamics. You will also learn that culture does affect communication within groups and at the organisational level.

ECS3002 Career Communication

This subject prepares you for your career by refining the technical writing skills that you have learnt in earlier Communication Skills modules, as well as providing you with the tools for an effective job search. Besides learning how to write a well-structured and coherent technical report for the workplace, you will also enhance your employability. You will learn the critical aspects of a job search, including skills analysis, writing resumes and cover letters, grooming and deportment, and interview skills.

ECT2001 Circuits & Control Systems

This subject introduces various concepts involved in the study of circuits and control systems. It provides you with the theories and practical knowledge of transient and steady state response of first and second order circuits, the structure of feedback control systems and stability analysis. The controllers and compensator design techniques used in control systems are also discussed. You will learn all the necessary skills to simulate, interpret and analyse the performance of various control systems and electric circuits.

ECT2004 Instrumentation & Computer Control

This subject provides you with the fundamentals of instrumentation and process control. It mainly covers process documentation, instrumentation and measurements, controller principles, multiple loop control system, as well as computer and digital control systems. You will be equipped with basic programming skills and essential knowledge of process instruments and control strategies which will prepare you for careers in the process automation and control industries.

ECT3002 Analytical Robotics

This subject introduces various concepts involved in the study of robotic systems. It begins with an introduction to the different types of robotic systems, mechanical forces and the law of motion, and the different types of actuators and sensors, as well as their application in robotics. Basic kinematics is also discussed to determine the pose and orientation of the object in space. Various mobile robot design considerations and embedded system design are also explored to emphasise the application aspects.

ECT3003 Robotic Control Systems

This subject focuses on digital control theory and state-space design in robotic applications. You will be introduced to the applications of modern digital design concepts in robotic control systems that will extend your skill and knowledge in state space design methods, digital system stability, and digital controller techniques. You will also learn to analyse, design and observe the characteristics of motion control systems through lab experiments and assignment projects.

EDM1001 Modelling & Animation

This subject provides you with the basic theory and skills for 3D animation production. You will be equipped with an understanding of the fundamentals of how animation software tools work, and gain experience in completing a 3D animation production development cycle.

EDM1002 Fundamentals of Digital Media Processing

This subject equips you with the fundamental knowledge of image, texture and audio editing using media processing techniques. These techniques are necessary basic building blocks in interactive digital media content development. Basic video editing skills will also be taught. The subject emphasises practical-based learning, through which you will acquire the essential knowledge and skills.

EDM2004 Advanced Digital Animation & Special Effects

This subject equips you with the knowledge and skills in applying advanced tools and techniques in 3D animation. It uses a practice-oriented approach to train you to rig a character and create physically realistic object motion, to apply visual effects techniques to create natural environment and phenomena with appropriate lighting and advanced render setting, and to create texture on 3D models directly.

EDM2005 Interactive Digital Media Project

This subject provides you with an opportunity to integrate knowledge learned in previous semesters to develop an Interactive Digital Media (IDM) production through working on a project in a team. Emphasis will be placed on your ability to be creative and work in teams, as well as problem-solving skills. The nature of the project could either be software or hardware, or a combination of both.

EDM2007 Fundamental 3D Interactive Digital Media

This subject provides you with the knowledge and hands-on experience in creating interactive 3D applications. Topics include 3D object creation, modelling, and scene composition.

EDM3001 Advanced Interactive Digital Media

This subject provides you with the knowledge and skill to develop interactive 3D digital media for use in numerous fields such as engineering, marketing, education and training. Topics include the use of virtual reality tool to create behaviour for objects, user interactivity with objects, build customised programs, and script for logic workflow.

EDM3002 3D Real-time Visualisation

The subject equips you with the skills and techniques to be competent in creating 3D real-time photorealistic interactive media content. Topics include the use of special rendering techniques, High Dynamic Range Imaging (HDRI) techniques, Low Polygon and High Polygon Modelling, Global Illumination, Texture Baking, and their corresponding methodology in reducing latency in real time 3D scenes.

EDM3003 Interactive 3D Display System

This subject provides you with the necessary knowledge of how various input and output interactive systems work. These systems include stereoscopic, auto-stereoscopic and holographic displays, pinch gloves, wands, as well as passive and active sensors. You will also learn how to use and apply these applications in various scenarios.

EDR1003 Engineering Drawing

Engineering drawing is essential for communicating engineering design. This subject will introduce you to the understanding and preparation of two-dimensional mechanical engineering drawings with the use of both manual and Computer Aided Design/ Drafting (CAD) software. You will also learn general methods of dimensioning according to international and local standards.

EED1001 Electronic Prototyping

This subject introduces you to the use of hand tools and standard laboratory equipment for the construction and testing of electronic prototypes. You will also learn to identify basic electronic components for project work and how to use them to build electronic devices.

EED1002 Printed Circuit Board Design

This subject provides you with the basics in designing a printed circuit board (PCB) through the use of a PCB design software. You will learn the various parts of a PCB and the terminologies used, and understand the various processes involved in the design and fabrication of a PCB. You will also have the opportunity to assemble and test a PCB prototype and apply basic troubleshooting skills to isolate faults in electronic circuits.

EED2005 Integrated Project

This subject provides an opportunity for you to apply the knowledge you have acquired. You will apply the tools, techniques and skills in creative problem solving, research and design, and project management.

EED2007 Mechatronics Design Project

To design a Mechatronics product that fits the needs of end-users, a designer's understanding and application of the underlying principles in microcontroller is needed. This subject provides you with the basic principles in the design and development of a mechatronics product through hands-on experience. You will have opportunities to develop a product idea using a Computer Aided Design system and having the paper design built through the prototyping techniques.

EED2008 Product, Process & Computer Aided Design

This subject provides you with a design-oriented environment in the creative design of products. The five main topics in this subject are: product and process design, design tools, needs and goals, product design specifications and developing concepts. You will also gain essential knowledge in design and process development by working on a semester project.

EED3009 Special Project 1

The focus of this subject is on the application of your existing domain knowledge to develop a deliverable. The subject will introduce new skills and knowledge specific to the project, as and when required.

EED3010 Special Project 2

This subject provides opportunities for you to apply your acquired knowledge and skills, along with your fundamental and in-depth knowledge from different subjects, in designing, developing, and implementing a well-engineered project solution.

EED3011 Higher Engineering Skills 1

Higher Engineering Skills 1 and 2 provide opportunities for you to develop different engineering skills – these skills could include hardware and software design and developmental skills, testing and measurement skills. The focus is on the practical aspects of engineering and the development of deft hands-on skill-sets. Creative and innovative ideas will also be encouraged. Exposure to new technologies, which may not be covered in the curriculum, will be introduced when necessary.

EED3012 Higher Engineering Skills 2

See Higher Engineering Skills 1 above.

EED3013 Rapid Prototyping & Model Making

Using various advanced rapid prototyping methods as well as basic processing of wood, metal and plastics, you will acquire a working knowledge of constructing physical 3D models for product presentation.

EEE1001 Circuit Analysis

This subject provides a good foundation in DC and AC network analysis. You will learn the basic principles of electric circuitry and how to apply circuit theorems to analyse DC and AC networks.

EEE1002 Electronic Devices & Circuits

This subject covers the theory and practical knowledge of electronic devices such as diodes, bipolar junction transistors, field effect transistors and their applications. It also focuses on the fundamentals of operational amplifiers and their applications, and the rudiments of circuit troubleshooting and testing.

EEE1003 Digital Fundamentals 1

This subject provides basic knowledge of digital electronics and circuits. Topics include number systems, operations and codes, logic gates, Boolean algebra and logic simplification, combinational logic, functional blocks, latches and flip-flops.

EEE1004 Digital Fundamentals 2

This subject builds upon the fundamentals of digital electronics acquired in Digital Fundamentals 1. It introduces the digital concepts of the various building blocks in a computer's digital system. You will acquire the theoretical and practical knowledge of registers, counters, memory devices, and conversions between digital and analogue signals and integrated circuit technologies. Digital troubleshooting techniques are also explored in the laboratory work.

EEE1005 Digital Fundamentals

This subject provides a basic knowledge of digital electronics. You will learn the theoretical and practical knowledge of fundamental digital concepts and basic building blocks of digital electronic circuits. Topics covered include number systems, Boolean algebra and combinational logic, sequential logic and memory devices.

EEE1006 Engineering Fundamentals

This subject provides a strong foundation in basic engineering concepts, electrical principles, circuit theorems, digital electronics and electronic devices.

EEE2001 Integrated Circuit Applications

This subject covers the applications of common integrated circuits. The fundamental concepts of operational amplifiers and their applications will be taught. You will learn how to use operational amplifiers to design clippers, clampers, comparator circuits and active filters. The applications of the 555 timer and voltage regulators will also be discussed.

EEE2003 Circuits & Signals

This subject focuses on advanced topics in analogue circuits and digital signal processing techniques used in biomedical instrumentation. Circuit design concepts involving differential operational amplifiers, electronic feedback systems and filter designs are introduced. Topics covered in signal processing techniques include signal acquisition signal filtering, convolution, and correlation. Applications of bioelectric signal processing include the design and implementation of algorithms to perform various stages of signal processing using MATLAB.

EEE3001 Advanced Electronics

This subject provides the basic concepts of designing and using linear integrated circuits for different functions such as amplifiers and voltage-controlled oscillators. The design of attenuators and filters, and fundamentals of sensors and transducers will be discussed too.

EEE3004 Power Electronics & Drives

This subject is an introduction to the study of machines, power semiconductor devices and their applications as power converters and motor drives. Topics covered include basic principles of DC and AC motors, fundamentals of controlled rectifier and drives, principles of DC choppers and drives, and inverters. The uses of semiconductor devices in power applications and thermal effects on the performance of these devices due to high power will also be discussed.

EER1001 Electrical Services for Facilities

This subject provides the basic theoretical and practical knowledge for the design of electrical distribution and installation in facilities. It also introduces the safety requirements and regulations governing electrical distribution and installation.

EER2001 Electrical Systems & Power Distribution

This subject covers the operation of a power distribution network system in the transmission and distribution of electricity. The topics include system earthing, circuit breakers, fuses, cables, and transformers. The different types of network protection scheme and calculations of fault will also be taught.

EFM1002 Workplace Safety & Health for Facility Management

This subject gives you an overview of a safe working environment in the area of facilities management. You will be equipped with the skills of identifying and reducing workplace related risks at source, and you will also be exposed to common practices taken in the industry to ensure a safe workplace.

EFM2004 Contract Management

This subject covers the knowledge of contract management that is aligned to the practices in the real estate industry. You will learn about all aspects of contract management which includes administration, procurement procedures, valuation of services and products, tenant management, and service delivery.

EFM3001 Sustainable Facility Management

This subject covers the roles of Facility Management (FM) in environmental sustainability. It will cover the integration of both areas so that students can see a connection between reducing carbon footprint and emission of the assets/properties under effective and thoughtful FM. It will also examine the policies and practices that FM should implement to achieve the said goals. The subject will describe the framework and strategies for achieving 'greener' results at the inception, design, construction to operational stage of a building. The subject will also provide an overview of the standards or rating systems that can be used to gauge the attainment of the sustainable goals.

EGB1001 Introduction to Green Development

This subject covers the fundamentals of a green development specifically within the local green building sector. You will learn the concepts, development and trends in the design and management of a green building. There will also be an overview of the current trends of green buildings.

EGB1002 Principles of Passive Design

This subject covers the passive design principles and strategies that may be applied to minimise building energy consumption while ensuring human comfort. It begins with an overview of passive design, followed by the fundamentals of climate analysis, heat transfer and thermal comfort, before moving on to discuss the principles and strategies of passive cooling, ventilation, heating and lighting. Emphasis is placed on passive cooling and ventilation strategies that are relevant to tropical cities such as Singapore. An important practical component of this subject is the use of airflow simulation software to analyse the performance of a naturally ventilated building.

EGB2002 Air Conditioning & Mechanical Ventilation

The Air Conditioning and Mechanical Ventilation (ACMV) system is one of the most important systems of a building and represents a significant portion of its total energy consumption. The subject will cover the use of psychrometric chart and pressure enthalpy diagram to facilitate the understanding of the working principal behind the air conditioning system. Various types of ACMV systems and energy saving strategies will be explored.

EGB2003 Hydraulics & Drives

This subject is designed to expose you to hydraulic and motor-driven systems used in buildings. It starts with introduction to fundamentals of fluid mechanics (Bernoulli's and continuity equations), losses in fluid flow in pipes and follows by sizing of pumps. The motor-driven systems portion of this subject includes fundamentals of electric motors, selection and sizing of motors for different applications. Efficiency of motor-driven systems and motor installation are explained at the end.

EGB2004 Tropical Architecture for Sustainability

This subject introduces passive design principles in tropical architecture, and will showcase all the examples of sustainable design from different parts of Asia from both past and present for contrast and comparison. Both traditional as well as cutting-edge technologies will be discussed, with emphasis on how materials are used in solving environmental problems. Topics covered include Tropical Architecture, South-east Asian Indigenous Buildings, Late-modern Architecture and Green Buildings. Issues regarding contemporary urbanisation and sustainability will also be explored.

EGB3001 Green Strategies for Building Systems

This subject covers the various energy efficient strategies for building systems to reduce energy consumption as well as data analysis for better system performance. For energy efficient strategies, it will focus mainly on the two larger energy consumption systems, namely air-conditioning system and lighting system. Carbon management for buildings will also be covered. A programming tool will be used to carry out data analysis and identify possible problem areas of a building system.

EGB3002 Green Building Modelling & Simulation

This subject provides an in-depth modelling and simulation concept of green buildings. Starting with climate analysis, you will be taken through hands-on stage-by-stage simulation tasks to demonstrate the impact of solar geometry on the building façade and indoor spaces. The simulation portion of this subject includes solar radiation analysis, shading design, lighting design, overshadowing and site analysis.

EGB3003 Total Building Performance

This module provides an overview of the key factors that affect the performance and efficiency of buildings. It introduces the performance mandates of a building and focuses on integrated approaches to meet the building performance criteria. Topics include spatial performance, thermal comfort and evaluation, air quality and acoustic performance, lighting aspects and building integrity performance.

EGB3004 Sustainable Design

This subject covers architectural design concepts used in building analysis of sustainable or green facilities. You will learn about the processes and practices of incorporating environmental and sustainable issues into integrated planning and the designing of green facilities. Principles for human-habitat and concepts of passive design will be applied in solving practical problems related to buildings. Air-flow simulation, sketches of models and charrettes will be used to visualise the design strategies and solutions, so as to effectively design spaces that can provide optimal year-round comfort and reduce energy consumption while limiting the impact on the environment.

EMA1001 Engineering Mathematics 1

This subject teaches pre-calculus techniques required for an engineering course. It trains you in engineering problem-solving approaches using the appropriate mathematical tools. Topics such as simultaneous equations, matrices, trigonometric, exponential and logarithmic functions, complex numbers and vectors will be covered.

EMA1002 Engineering Mathematics 2

The subject introduces the concept of calculus. Differentiation and integration techniques will be covered. These concepts will be used to formulate and solve mathematical problems. Various differentiation techniques (e.g., chain rule, product and quotient rules), and integration techniques (e.g., substitution, use of the mathematical table, integration by parts, partial fractions decomposition) will also be covered.

EMA2001 Engineering Mathematics 3

This subject introduces ordinary differential equations and approximation using the Maclaurin series and Fourier series. You will learn how to formulate engineering problems using first and second order differential equations and to solve initial value problems using techniques such as Laplace transforms. The application of statistics – Hypothesis Testing – will also be taught.

EMA3001 Higher Engineering Mathematics

The subject introduces mathematical concepts and techniques used in advanced engineering courses. You will learn topics in calculus such as limits and continuity, infinite series, improper integrals, multiple integrals, higher order differential equations, 2D and 3D analytic geometry, and partial differentiation.

EMC2001 Microcontroller Technology

This subject provides you with a working knowledge of embedded systems. It exposes you to the basics of microcontroller architecture, programming and application development. You will acquire the knowledge and skills through the development and testing of smart microcontroller-based systems for real-world applications such as an intelligent clothes hanger, a smart home, a bank automated queuing system, or a traffic-light and pedestrian crossing control system, among many others.

EMC2005 Computer Interfacing

This subject provides the knowledge and skills of interfacing peripherals to the Personal Computer (PC). You will be exposed to various PC interfacing techniques, such as serial, parallel and USB interfacing, computer bus standards and protocols.

EMC3002 Embedded Control & Applications

This subject provides enhanced knowledge of microcontroller-based embedded systems with emphasis on interfacing and applications. You will learn to use the built-in peripherals of the microcontroller and design the software and interfacing circuits to implement embedded applications. You will also work on a group project that uses most of the internal peripherals, programming and interfacing techniques learnt in the subject.

EMC3004 Data Acquisition Systems

The subject covers PC-based data acquisition concepts. It encompasses signal conditioning, transducers, virtual instrumentation, signal measurement and data acquisition techniques, as well as interpretation and presentation of acquired data. You will acquire the skills through hands-on experience in installing, configuring and using PC-based data acquisition hardware and software.

EMD2001 Medical Electronics

This subject introduces fundamental instrumentation theories for biomedical applications and design requirements for the measurement of bio-signals. Topics include electrodes and transducers, bio-potential measurements, amplifier basics, differential and instrumentation amplifiers. Filter designs, noise and electromagnetic interference issues are also discussed.

EMD2002 Medical Devices

This subject provides you with knowledge on the working principles, safety and reliability issues related to the use of medical devices in the healthcare sector. You will learn the fundamental concepts of diagnostic devices, lifesaving and support devices, critical care devices and some of the specialised therapeutic devices used in pain relief and rehabilitation.

EME1002 Statics & Strength of Materials

This subject consists of two main areas: the fundamentals of statics and strength of materials. Fundamentals of statics provide an introduction to the basic concepts of bodies in statics, whereas strength of materials introduces the methodology for designing structural members subjected to various loading conditions.

EME2004 Programmable Automation

This subject provides you with the fundamentals underlying the contemporary manufacturing automation environment. Four main topics are covered in this subject; namely pneumatics, electro-pneumatics, programmable logic controllers and factory automation. You will gain the essential knowledge of the working principles and applications of automation equipment related to the topics covered, followed by an overview of how to automate production processes to achieve quality and high productivity. Both hardware and software links between the main factory automation components are introduced.

EME2006 Engineering Materials

The subject will cover mechanical, thermal, durability and other secondary properties of materials used in engineering design. Both the design process and material selection strategy will be covered. Students are also introduced to various manufacturing, joining and surface treatment processes.

EME2007 Machining Technology

This subject introduces the various manufacturing processes including computer-controlled processes and you get hands-on practice with conventional and Computer Numerical Control (CNC) machines. You will also learn about Computer-Aided Design and Manufacturing (CAD/CAM) system. Safety aspects are emphasised throughout the workshop sessions. You will acquire the fundamental knowledge and skills in designing for the manufacturing sectors such as the tool and die industry.

EME2008 Principles of Dynamics

The application of dynamic systems theory can be seen everywhere in our daily lives, from vehicles moving on the road to planes flying in the air. In this subject, you will learn the fundamental principles of dynamics and apply them to the analyses of bodies in motion. The main topics covered include Newton's laws of motion, the principle of work and energy, the principle of impulse and momentum, gyroscopic principles and periodic motion.

EME2009 Thermodynamics

This subject equips you with the basic knowledge in thermodynamics, concepts of the temperature scales and measurements, the First Law of Thermodynamics, Ideal Gas Laws, Second Law of Thermodynamics and heat energy calculations using a P-V diagram. The syllabus is based on the guide for relevant topics on thermodynamics listed in the Singapore Airworthiness Requirements (SAR-6) Module 2 "Physics". Knowledge of this subject allows you to understand the mechanisms of heat transfer and how gas turbine engines work.

EME2010 Fluid Mechanics

This subject provides you with fundamental knowledge in applied mechanics of fluids under incompressible viscous flow conditions. It covers fluid properties, fluid statics, fluid in motion, governing equations, viscous flow through duct, minor losses, multiple-pipe system, drag and lift, and compressible flow. Knowledge of this subject will enable you to appreciate the aerodynamics of an aircraft and fluid-flow concepts in turbine engines and aircraft systems.

EME2011 Engineering Design

This subject applies elementary engineering principles to the design and selection of common mechanical elements and systems. You will have the opportunities to explore topics such as material selection, mechanical joining, mechanism, motion transmission and design for machining and assembly. Computer aided Design (CAD) tools will be used to reinforce the learning of this subject

EMF3002 Manufacturing Logistics & Simulation

This subject covers the concept of logistics in manufacturing, manufacturing planning, purchasing, warehousing, and simulation. PC software will be used to enhance your learning.

EMF3004 Automation & Machine Vision

This subject comprises two parts: Automation and Machine Vision. In the first part, you are given a basic understanding of the main components of an automatic system, ranging from various types of motor, servo system, sensors and programming techniques. The second part will expose you to the basic principles of machine vision systems, including some methodologies and techniques commonly used in the industry. The fundamental knowledge of the industrial automation, machine vision and their applications are covered.

EMI2001 Semiconductor Physics & Devices

The subject covers the physics of semiconductors. The motion of electrons and holes in semiconductors is discussed. The fundamental principles underlying the formation of a p-n junction, different types of contact to semiconductors and a Metal Oxide Semiconductor (MOS) capacitor are explained. The subject also covers the operating principle of a photovoltaic cell and a Metal Oxide Semiconductor Field Effect Transistor (MOSFET).

EMI2002 Wafer Fabrication Process Technology

The subject covers the various process technologies used in semiconductor IC wafer fabrication, such as oxidation, diffusion, ion implantation, thin film deposition, photolithography, and etching. For each process technology, it covers definition, process mechanism, process equipment, process parameters and process application. You will also be given practical training which involves carrying out the semiconductor wafer fabrication process, evaluating the process outcomes as well as operating the various equipment used in the cleanroom. Technology Computer Aided Design (TCAD) software will also be used to simulate the wafer fabrication.

EMI2005 IC Packaging & Failure Analysis

This subject covers the technologies and processes of IC assembly as well as IC failure analysis. The IC assembly includes various processes such as die attachment, wire bonding and encapsulation. The latest advancements in IC packing such as flip chip and chip scale packaging will be discussed. IC failure analysis includes various techniques such as optical microscopy, X-ray imaging and electron microscopy.

EMI2008 IC Process Integration

This subject covers the design of photo-masks, sequencing of processes to form a process flow, technologies in processing of solid state devices, isolation and interconnection structures, application of test structures for process monitoring as well as the characterisation and functionality testing of basic solid state devices.

EMI2009 IC Layout Design

This subject covers the techniques of Integrated Circuit (IC) layout starting with the fundamental relationship of the channel width and channel length dimensions of a Metal- Oxide Semiconductor Field Effect Transistor (MOSFET) to its characteristics. The design steps and layout of MOS transistors, basic Complementary MOS (CMOS) logic gates and static CMOS circuits will be explored. Layout techniques and considerations for power supply distribution, yield improvement and transistor matching are also discussed. The importance of layout design rules and the impact of Nano CMOS device dimension on design will also be highlighted. Computer Aided Design (CAD) and IC Design tools are used for practical experience.

EMI3001 Microelectronics Test & Measurement

This subject covers the test and measurement of semiconductor devices, a process integral to the manufacturing of semiconductor devices. Equipment and related software tools for testing and debugging of digital and mixed-signal devices are used for practical experience.

EMI3005 Cleanroom Equipment & Technology

This subject introduces contamination control in a cleanroom and the factors to control the environment. It includes wafer plant facilities, process equipment and vacuum technology. Practical training includes appreciating the environment in the cleanroom, identifying the various components of a deionised water purification plant and operating vacuum pumps and systems.

EMP3001 Major Project

The Major Project gives you an opportunity to integrate and apply your knowledge in a practical learning situation. Besides research, design and project management skills, the emphasis will also be on innovation, creativity, teamwork and enterprise.

EPH3001 Principles of Photonics

This subject explores the fundamentals of photonics theory including concepts and application of photonics. It delves into the laws of reflection and refraction, principles of wave optics (including interference, diffraction and polarisation), fundamentals of fibre optic theory, principles of lasers and laser safety, and the basics of holography.

EPH3002 Optical Communications

This subject delves into the laws governing transmission of light through fibres, classification of fibres, loss mechanisms and dispersion in fibres, optical modulation, multiplexing and de-multiplexing, as well as the procedures used in the design and analysis of an optical communications system.

EPH3003 Optical Devices

This subject equips you with the knowledge and concept of optical devices. It covers the structure and characterisation of coherent and non-coherent optical sources, namely: light emitting diodes and laser diodes, optical detectors, optical amplifiers, passive optical devices, modulators, switches, optical integrated circuits, sensors and photonic devices for imaging, display and storage.

EPZ1001 Introduction to Processes & Systems

This subject provides you with a basic understanding of the concepts, tools and approaches to business process management as well as the context in which these approaches are made within larger systems of business organisations or entities.

EPZ3001 Customer Relationship Management

This subject provides an in-depth view of Customer Relationship Management. It covers the basic concepts of CRM, leading to implementation of strategies within an organisation. Focus will be on using technologies to adopt a customer-focused approach and strengthening customer relationship.

EQM2001 Process Management & Innovation

Process Management is the management of business as a series of processes resulting in the creation/ improvement of products and services that customers need. This subject provides the understanding of concepts, theories and methods a team leader needs to initiate and carry out process improvement activities. Key topics include process management, analysis, improvement, and innovation.

ESC1001 Chemistry

This subject provides you with an understanding of the fundamentals of chemistry concepts and applications useful in the bioengineering field. Topics covered include the principles, theories and applications of physical, inorganic and organic chemistry, ranging from atomic structure and electron configuration, stoichiometry, the periodic table, chemical bonding, equilibria, electrochemistry, and thermochemistry to topics of organic chemistry covering the hydrocarbons, haloalkanes, the hydroxy, carbonyl and carboxylic acids compounds. Essential practical sessions on chemical experimentation are also covered.

ESC1002 Engineering Physics

This subject covers a spectrum of fundamental physics laws and concepts applicable to the scope of engineering physics. It covers a few core areas including Mechanics, Energy, Thermal Physics, Electromagnetism, Waves, as well as Optics and Materials. This subject provides a foundation for a further in depth study of the various engineering disciplines.

ESE1006 Computer Programming for Problems Solving

This subject covers the process of decomposing a problem into a sequence of smaller abstractions. The abstractions are implemented in software in a structured top-down approach. Software implementation includes the process of designing, writing, testing, and debugging program code.

ESE2004 Object-Oriented Programming

This subject provides you with a good understanding of Object-oriented programming principles together with a good understanding of how Object-oriented software is designed. The introduction of Object-oriented programming concepts will go hand in hand with the introduction of Object-oriented Design methods and practices through the use of Unified Modelling Language (UML). Essentially when you are introduced to a new programming concept, you will learn to model the newly introduced programming concept. As the subject progresses and the complexity of the programs increase, more software design UML modelling tools will be introduced.

ESE2008 New Media Marketing Applications

This subject gives an Introduction to new media marketing, the User Experience (UX), as well as the development and use of analytics measurement in new media. The subject will focus on the development of applications for Facebook.

ESE3001 Database Management System & Design

This subject focuses on the design and creation of database e.g. using the Oracle Database System. The topics covered ranges from the initial design of the database using modelling tools (Entity-Relationship model using Unified Modelling Language), to the refinement of the models using Normalisation techniques. It will also include the learning of the database programming language, Structured Query Language (SQL), and JavaServer Pages (JSP) for web page creation, as well as Java Database Connectivity (JDBC).

ESE3006 ASP.NET Web Programming

This subject focuses on providing appropriate knowledge and skills to develop ASP.NET Web applications on the .NET platform. After an introduction to different .NET related tools and languages, the procedure to create Web Form is demonstrated. Data accessing using ADO.NET is then covered followed by the use of web tools to enhance and improve functionality. Finally, the method to deploy ASP.NET web applications in mobile devices will be introduced using online emulators and HTML5 tools in Visual Studio.

ESE3008 Web Services Development

This subject covers the basics of building and consuming web services using various web services protocols. The cloud computing concept will then be introduced and the various types of cloud services will be discussed. The skills to build applications, that will make use of these different cloud platform services as well as to deploy them on the cloud, will be taught.

ESE3009 Computer Architecture & Operating Systems

This subject introduces the fundamental design concepts of a typical computer system which forms the system architecture. You will also learn about the components of a computer operating system that support this architecture.

ESI2001 Student Internship Programme

The on-the-job training nature of the programme allows you to gain some industrial experience. Through this programme, you will be exposed to the work environment so that you can better appreciate and understand the problems and issues at the work place. The content and scope of learning varies from organisation to organisation. However, it is envisaged that after the programme, you would have, in general, developed your communication and interpersonal skills as well as the right work ethics, and also become more mature, confident and independent, and have a more realistic expectation of what a working environment is like.

ESZ1001 Systems Concepts & Tools

This subject provides you with the basic knowledge and skills to apply systems thinking language and modelling approaches to solve real-world issues. Tools that will be introduced include causal loop diagrams, archetypes and system dynamics. You will also learn to use a software to model issues using the systems thinking and modelling approach. The relationship between systems thinking and the learning organisation will also be discussed.

ESZ1002 Quantitative Methods

This subject introduces basic statistical concepts. Topics include descriptive statistics, probability distributions, estimation of population parameter, hypothesis testing, and simple linear regression.

ESZ2001 Decision Analysis

This subject provides an introduction to the decision-making process and the models applicable to solve various decision problems. It covers methods and techniques for decision making such as linear programming, transportation model, network models and decision trees.

ESZ2002 Process Optimisation & Improvement

This subject provides an overview on the concepts of quality improvement and process optimisation. It establishes the fundamental to quality concepts. You will learn how to analyse statistical control results, experimental designs, variations in processes and applying improvement techniques. Practical sessions using software applications will be integrated to enhance your learning.

ESZ2003 Management Systems & Assessment

This subject provides an overview of general management systems used in industries. You will acquire the knowledge and requisite skills in planning a Quality Management System, Environmental Management System as well as conduct a Quality Audit. Practical sessions to set up a simple quality management system, starting from writing a quality procedure to conducting an audit will be carried out.

ESZ3001 Supply Chain Management

This subject covers the concept behind supply chain management in competitive business survival and key strategic drivers that improve supply chain management performance of an enterprise. It also covers the importance of managing inventory, selecting appropriate distributing and transportation network.

ESZ3002 Systems Modelling & Simulation

This subject provides an introduction to fundamental concepts of system modelling and simulation. Topics include basic model development, input analysis, modelling and statistical analysis. A simulation software is extensively used as a vehicle to enhance the understanding and practical applications of the subject.

ESZ3003 Systems Engineering & Management

This subject equips you with systems engineering management knowledge as well as the skills to be able to apply the knowledge learnt to analyse the systems dynamics, identify opportunities to enhance systems performance, or design solutions for a new system. Skills involving assessing risks and uncertainties of such systems will also be introduced.

LEA1001/1002/1003 Leadership: Essential Attributes & Practice (LEAP)

This is a Leadership & Character Education programme which consists of three core subjects – LEAP 1, 2 and 3. It seeks to cultivate in you the dispositions (i.e. attitude, skills and knowledge) towards the development of your leadership competencies. It is a leadership programme that enables you to develop leadership life-skills that embrace character as the core foundation for your leadership credibility and influence.