
I can
Explore
My Dreams
With SP, it's So Possible
SINGAPORE POLYTECHNIC
SP
Prospectus 2018 / 19


ND THE WORLD
Arctic Ocean
Atlantic Ocean
Pacific Ocean

Mission

A future-ready institution that prepares our learners to be life-ready, work-ready and world-ready.

Vision

A caring community of inspired learners committed to serve with mastery.

Core Values

Self-Discipline / Personal Integrity / Care and Concern / Openness / Responsibility / Excellence

How to use this prospectus

The Singapore Polytechnic Prospectus is divided into two parts.

Part 1 presents general information about Singapore Polytechnic, campus services available and its facilities.You will also find information about life on campus including the various programmes and activities that make life as a polytechnic student challenging and fulfilling. It contains useful information for international students as well.

Part 2 has details of all full-time and part-time courses offered by Singapore Polytechnic. Entry requirements, fees and how you should apply are found here.

Singapore Polytechnic

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Republic of Singapore

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Students are our focus at Singapore Polytechnic (SP). Established in 1954 as Singapore's first polytechnic, we have been fulfilling our mission of educating our students to excel in work and life, and to equip adult learners with professional skills and knowledge.

In 2014, we celebrated 60 glorious years as an institution, and with it, a new direction for the future. We have crafted a new vision to carry us beyond 2014, a vision to nurture a caring community of inspired learners, committed to serve with mastery.

Quality Education

SP maintains high academic standards, driven through our passionate staff who serve with mastery. Curriculum proposals are examined in detail to ensure relevance and satisfactory course delivery. Courses are also monitored and evaluated for continuous improvements, reviewed with valuable feedback from the industry, graduates and students. Out-of-classroom learning opportunities are also available, in the form of industry attachments, student exchanges and study trips, both local and overseas.

Two-thirds of our graduates move on to earn degrees at local and foreign universities, including top institutions such as Harvard University, Massachusetts Institute of Technology and Imperial College London. Our diplomas are widely recognised by over 150 universities worldwide, many of which grant advanced standing or credit exemptions to our graduates.

Enriching Campus Environment

Easily accessible by public transport, with Dover MRT station right at its doorstep, you will find the sprawling 38-hectare SP campus conducive for learning and socialising. State-of-the-art facilities at SP include studio-based learning facilities, living laboratories which provide real-life and immersive learning opportunities, and two libraries. The campus is supported by an integrated digital environment — comprising of campus-wide high-speed Gigabit Ethernet and Wireless LAN networks — for students to access information and e-services for effective learning.

SP is self-sufficient with six food courts, a variety of retail shops, and a bank. Adding vibrancy to campus life are the many recreational and sports facilities, including gymnasiums, an Olympic-size swimming pool and the Sports Arena, a dedicated sports facility with an outdoor rock climbing wall and numerous badminton, basketball, squash and tennis courts. There is also the Student Hub@ Moberly, a popular chill-out venue with music jamming studios, dance studios and a café.

SP for Life

As part of the SP family, you would have established a lifelong link with us. Our Department of Student Development and Alumni Relations, SP Graduates' Guild and individual schools maintain close contact with more than 195,000 alumni, many of whom are now successful academics, captains of industry and entrepreneurs.

We encourage you to make the most of your time at SP so that by the time you graduate, you will be life-ready, work-ready and world-ready.

With SP, It's So Possible.

INFORMATION & DIGITAL TECHNOLOGY SERVICES

Singapore Polytechnic's (SP) journey towards a Smart Campus began with the introduction of computer-based learning and computer literacy in the 1980s. Today, SP's Smart Poly vision is to enhance teaching and learning, improve the quality of work and life and also to drive innovation and transformation through the use of smart technology, thereby providing a vibrant and enriching experience to the SP community.

SP's high-speed campus network provides the SP community with seamless connectivity and mobility to a plethora of IT services that puts "Teaching and Learning", "Working" and "Lifestyle" convenience at their fingertips. Leveraging on the use of smart technologies such as learning analytics, online teaching and collaboration platforms, SP is able to deliver lessons that are not only engaging but personalised to improve its students' learning outcome. Students are able to access these lessons and also collaborate with their peers and lecturers from anywhere and anytime. Location-based technologies are also implemented to support delivery of personalised services, e.g. real-time push notifications, navigation around the campus and to locate less crowded study spaces and dining areas on campus.

SP's Department of Information & Digital Technology (INDT) Services strives to provide comprehensive IT services that are capable of meeting the ever changing and demanding needs of SP's staff and students.

By offering an agile digital environment, our staff and students are able to have better and faster access to information and e-services.

They are also able to communicate and collaborate with each other better and to learn, teach and work with greater effectiveness and efficiency.

INDUSTRY SERVICES

The Department of Industry and Partnerships (I&P) plays a pivotal role in fulfilling the Polytechnic's mission to prepare our students to be life-ready, work-ready and world-ready.

This is achieved by providing a holistic approach to the students' learning journey through the Internship programme and other industry-related initiatives.

I&P leads the Polytechnic to engage industry partners to give our students opportunities for real world learning. The services provided by I&P are as follows:

1. It serves as one-stop resource centre for industry partners that are keen to collaborate with SP.
2. It administers the Internship programme that aims to let students learn through meaningful work assignments and industry exposure to deepen and apply both technical and soft skills, and help them make better career choices.
3. It helps in the implementation of SkillsFuture initiatives such as the Earn & Learn Programme, Enhanced Internship Programme and Sector Coordination by collaborating with the academic schools, relevant departments, industry partners and government agencies.
4. It organises activities to cultivate & nurture entrepreneurial learning and mind-sets among the SP community.

LIBRARY

The Library is a key learning hub on campus. As a companion to SP's progressive pedagogies, it provides vital connections to information, people, ideas and spaces that inspire lifelong learning through independent discovery. Students will find creative spaces and the freedom to explore ideas in the Library. From 3D printers to specialised databases, SP librarians curate up-to-date resources to create rich learning experiences for users.

LEARNING SPACES

At the **Main Library**, students are welcomed to a variety of learning spaces such as:

- **Makerspace and FabLab** – where technologies, equipment and tools such as laser cutter and 3D printers are available for students to tinker, experiment, create and learn from making. Resources include Arduino, Raspberry Pi, IoT kits, and other DIY electronics kits. For more information, please visit **library.sp.edu.sg**.
- **Da Vinci Level** – provides resources on architecture and design, facilities such as pods with projectors, writable tables and walls, and exhibition space.
- **Project Pods** – where students collaborate and discuss projects.
- **Quiet Zone** – for independent quiet study and reflection.
- **Programme Zone and Event Box** – for sharing and learning through talks and workshop activities.
- **Exhibition Zone** – for thematic displays and showcasing projects from students and Schools and innovations from industries.
- **Colours Zone** – an informal space for students to socialise, play board games, conduct group discussions and also serves as exhibition and event space.

In these spaces and other reading areas, students have access to a core collection of books and multimedia on engineering and technology, design and architecture, health and life sciences, maritime studies, management and lifestyle interests.

At **Hilltop Library**, resources on business, IT and digital media, and communication, arts and social sciences are provided to support the schools teaching courses in these areas. The compact yet comfortable library is surrounded with lush greenery, and offers project pods and meeting rooms.

Learning also takes place in the libraries through activities like talks by lecturers and industry experts. Workshops on making, such as 3D printing and scanning, tinkering with electronics kits, 3D design, photo editing and video making are conducted in the Makerspace. In display spaces, students exhibit their projects, ideas and achievements to the campus community.

(Photo above: Explore new and innovative materials from the material samples collection.)

INFORMATION ANYTIME, ANYWHERE

An extensive collection of electronic and physical resources may be viewed from the library website (**library.sp.edu.sg**). These resources support all courses taught as well as encourage the personal development of students. Using this collection coupled with the latest technology, mobile friendly information services are brought to users wherever they may be or whatever device they use. Highlights include:

- OneSearch, a search engine which enables users to search the catalogue and the Library's electronic resources at one go. Access to e-resources including e-books, e-journals, e-videos, databases, student project reports and past exam papers, is available 24/7 from any location with Internet access.
- Access to library resources for course modules is integrated with the campus course management system.
- Various communication channels, including an online chat service, which lets students request for help.
- Updates on the latest library resources and activities via social media like Instagram, Facebook, Twitter, and YouTube.

Personalised services are also available to help busy users:

- Resource lists customised for students/ staff according to their courses/modules.
- My Librarian – one or more librarians are assigned to each school, so that users may contact them directly for their information needs.
- Project Advisory Service – students working on projects may get help from librarians on appropriate information resources and citing of references.

User education is a key focus of the Library. From their first day on campus, the Library orientates new students to harness its full range of resources. Year 1 students are introduced to basic research skills and key scholarly or industry information sources through an online information literacy module. Subsequently, they can continue to improve their information literacy skills through workshops, talks and consultations with their school librarians. This suite of instructional sessions is complemented by LibGuides co-prepared by lecturers and librarians to introduce relevant resources for modules and research interests.

Another focus of the Library is content curation. Acknowledging today's environment where the information we encounter daily can be excessive and overwhelming, our librarians evaluate and curate the most useful information for our users. SP librarians provide advice and package information ranging from trend analyses to state of research reports, to assist users in navigating the information environment efficiently and confidently.

SP MEMORY PORTAL

The Library also runs the SP Memory Portal **(myspmemories.sp.edu.sg)**, an institutional initiative to collect and preserve the stories and memories of our polytechnic community. The thousands of stories and photos in this repository allow students, staff and alumni to discover, enjoy and appreciate our rich heritage of over sixty years of polytechnic education.

DIGITAL TECHNOLOGY AND FACILITIES

In addition to the variety of electronic services available from the library's website, students are also provided opportunities to explore and adopt new technology. Facilities include PCs, iMacs, Photo Studio, Audio Recording Studio, One-Button Studio for recording video presentations, scanners, printers, digital media tools, and touchscreen TVs for browsing digital newspapers and magazines.

LOAN SERVICES

Borrowing and returning of library materials are quick and convenient with the use of self-service loan kiosks, books pick-up lockers and smart returns stations. A pickup/transfer of materials service between libraries may be requested via the catalogue. Electronic forms are also available for a variety of requests like purchase of new resources, articles, and information enquiries.

SOCIAL HUB

Beyond its educational role, the library is also a social hub for all walks of students from different disciplines. Peers sharing a cuppa, viewing a cross-disciplinary exhibition, making their first gadget, meeting friends for a board game, or simply rushing a group project – all these happen daily at the library and add to the buzz that makes it a campus hot spot.

We welcome all to join the lively community at SP Library. For more information, please visit: **library.sp.edu.sg**.

(Photo above: Working out project details at the Wonderland Pod.)

PROFESSIONAL & ADULT CONTINUING EDUCATION (PACE) ACADEMY

SP has been involved in Continuing Education and Training (CET) since 1979, and the Professional & Adult Continuing Education Academy or PACE Academy was set up in SP in 2009. PACE Academy is a multi-disciplinary CET Academy committed to providing quality CET programmes to Professionals, Managers, Executives and Technicians (PMETs). PACE Academy offers a variety of relevant courses, meeting the needs of the community of adult learners. It aspires to be a leading CET Academy in Singapore that transforms adult learners through innovative educational experiences.

SP, particularly through the conduit of PACE Academy, supports the national SkillsFuture movement in promoting lifelong learning and skills acquisition.

PACE Academy offers CET programmes in seven broad categories:

PROGRAMMES

Part-Time Diploma and Post-Diploma Programmes

PACE Academy offers part-time diploma courses under the Ministry of Education's Continuing Education and Training (CET) Qualification Framework. Besides diplomas, there are three types of Post Diploma courses. They are the Advanced Diploma, Specialist Diploma and Diploma (Conversion) courses.

Part-time diploma course consists of 5 Modular Certificates (MC). Students pursuing the courses will be awarded with the MC for each phase of their studies. Upon completion of the 5 certificates within a 5-year validity period, the participant will be conferred a Diploma qualification from Singapore Polytechnic. The course can be completed in 2.5 years.

A wide range of post diploma courses are offered to suit the needs of adult learners who already possess a diploma or degree. These courses aim to provide learners with deeper understanding and skills to better perform their jobs in industry and/or to switch to new sectors to enhance their career prospects. Students pursuing the courses will be awarded Post Diploma Certificates (PDCs) for each phase of their studies. Upon completion of the required PDCs within a validity period, the participant will be conferred a Post Diploma qualification from Singapore Polytechnic.

Details of the courses offered can be found in the PACE website (**http://ptdip.sp.edu.sg**).

Earn and Learn Programmes

The Earn and Learn programme (ELP) is a work-study programme designed to give fresh polytechnic graduates a head-start in careers related to their discipline of study. It provides them with more opportunities to build on the skills and knowledge they acquired in school, and to better support their transition into the workforce.

Singapore Workforce Skills Qualification (WSQ) Programmes

PACE Academy supports the Workforce Singapore (WSG) and SkillsFuture Singapore (SSG) in providing programmes certified through the WSQ Framework. PACE offers various programmes ranging from individual modules, to full qualifications in the WSQ framework.

The areas are as follows:

- Environmental Technology
- Food & Beverage
- Instrumentation & Control Engineering
- Logistics
- Occupational Hygiene Professionals
- Pharmaceuticals & Biologics Manufacturing
- Precision Engineering
- Process – Chemicals
- Process Manufacturing – Biologics & Pharmaceuticals
- Process Manufacturing – Engineering Services (Instrumentation & Control)
- Process Manufacturing – Environmental Technology
- Workplace Safety & Health Professionals

Certification Programmes

PACE Academy works closely with many professional bodies and government agencies to offer courses leading to professional certification or licensing. Examples include:

- Boiler Attendant Class 1 & 2
- Certificate of Competency (CoC) Course for Deck and Marine Officers
- Certificate for Employment Intermediaries (CEI)
- Environmental Control Officers (ECO)
- Optometry Courses
- Powered Pleasure Craft Driving License (PPCDL)
- Steam Engineering 1st and 2nd Grade Certification

Short Programmes, Conferences, Workshops and Seminars

We organise Conferences, Seminars and Workshops that feature subject matter experts delivering information via lecture and discussion. Participants can expect to receive up-to-date information about industry developments and latest trends.

PACE Academy also offers programmes with shorter durations catering to specific needs of individuals or organisations. Some of these programmes are funded by the Skills Development Fund (SDF). Some of these programmes are offered using the e-learning mode through our e-Academy.

Online Programmes on ePACE

PACE Academy keeps moving in the fore front of e-Learning and this portal provides the focal point of our e-Learning efforts for the adult learners. There are several programmes from short courses such as Operationally Ready (ORD) boys and Preparatory courses for University to skill based courses in different fields.

Customised Programmes

These are programmes customized to the needs of organizations. PACE Academy is able to harness the strengths and expertise of the academic schools in our polytechnic and our partners in industry to package specific and targeted training programmes for organizations.

For more details of all our courses, please visit **www.pace.sp.edu.sg**.

STUDENT SERVICES

The Student Service Centre (SSC) is conveniently located at level 1 of Block T16, opposite the Dover MRT Station, next to McDonald's.

It is an accessible one stop centre for students and visitors to obtain information and services related to SP full-time diploma courses and student matters. Computers are also available at SSC Self-Service corner for students to access SP's various online services.

CONTACT US

Student Service Centre
T16 Level 1 (Next to McDonald's)
Opposite Dover MRT Station

Hotline: Contact no: **67751133**
Email Address: **contactus@sp.edu.sg**

www.sp.edu.sg/ssc

Key Services

- Admission Enquiries
- Counselling Services
- Course Transfer or Withdrawal
- Education & Career Guidance
- Exam Related Matters
- EZ-Link Card
- Financial Assistance
- Graduation Matters
- Insurance
- Lost and Found
- Outbound Services
- Scholarships
- School/Course Fee Payment
- Special Education Needs Support
- SP Blazer Loan Service

EDUCATION AND CAREER GUIDANCE

Students can visit the Education & Career Guidance (ECG) Centre, located inside the SSC, for resources on post-diploma education and careers. Appointments to meet with our friendly ECG Counsellors can be made via the Student Portal or in person at the SSC during office hours.

SCHOLARSHIPS

Students can visit our website (**www.sp.edu.sg/scholarships**) for the latest information on the various scholarships, eligibility criteria and dates for application.

COUNSELLING SERVICES

Services available include individual counselling, group counselling, referrals to external help agencies and psychological testing.

Students, who need a helping hand or a listening ear in times of crisis or anxiety, can approach our friendly student counsellors for assistance. Appointments can be made via the Student Portal or in person at the SSC during office hours.

SPECIAL EDUCATIONAL NEEDS (SEN)

Students with SEN can visit the SEN Centre at block T17 level 2 for assistance on academic support, counselling, examination accommodations, assistive technology devices and campus accessibility. Appointments can be made via the Student Portal or in person at the SEN Centre.

FINANCIAL ASSISTANCE

Students in need of financial assistance can apply for various financial assistance schemes and bursaries. Interest-free study loans are also available. The SSC also manages a Needy Fund to help students in dire financial need.

Please visit our website (**www.sp.edu.sg/financialassistance**) for the latest information on the various financial assistance schemes available, eligibility criteria and dates for application.

OUTBOUND SERVICES

The Outbound Services (OS) unit provides administrative support for schools and students in their quest to foster a Global Orientation mind set. Students are given overseas attachment opportunities to gain invaluable insight to global, economic and social conditions; and to inculcate character building traits which they can apply to future work, business, and life.

The OS unit supports the schools by performing administrative functions for overseas academic programmes, which include procurement of overseas trip components, review of student's applications, calculation of funding quota, etc.

SCHOLARSHIPS

In SP, students with outstanding academic results and excellent co-curricular activities (CCA) records are recognised with the award of scholarships.

SP SCHOLARSHIPS

Each year, up to 30 prestigious SP Scholarships are offered to Year 1 students with excellent academic results, outstanding CCA records and strong leadership potential.

SP Scholars receive an annual sponsorship of $3,000 per year (renewable every year) and subsidies for enrichment programmes. In addition, SP Scholars are put through a series of development programmes and activities as part of the Singapore Polytechnic Outstanding Talent (SPOT) Programme.

SP ENGINEERING SCHOLARSHIP

SP was the first polytechnic to offer this scholarship. Each year, up to 30 prestigious SP Engineering Scholarships are offered to Year 1 students in our engineering courses with excellent academic results, stellar CCA records, strong leadership potential and a passion for engineering. SP Engineering Scholars will be identified for R&D attachments locally or overseas and attend engineering conferences and activities to keep abreast of developments in related fields.

SP Engineering Scholars receive an annual sponsorship of $3,000 per year (renewable every year) and subsidies for enrichment programmes. In addition, SP Engineering Scholars are put through a series of development programmes and activities as part of the SPOT Programme.

SP SPORTS AND ARTS SCHOLARSHIPS

This category of scholarships recognises students who have excelled in or contributed to the sports and arts scene at the national level or higher. Each scholarship consists of an annual sponsorship of $2,000 and is renewable over three years.

Please visit our website for the latest information on the various scholarships available, eligibility criteria and dates for application.

www.sp.edu.sg/scholarships

STUDENT DEVELOPMENT & ALUMNI RELATIONS

The Department of Student Development & Alumni Relations (SA) nurtures a holistic development for its students and grooms them into responsible, resilient and caring individuals through the arts, sports, community service, CCAs, leadership and international enrichment programmes. These activities develop the life skills of students to ensure that they are ready for the future. After graduation, the alumnus continues to be a part of the community that testifies SP as a future-ready institution.

DEPARTMENT OF STUDENT DEVELOPMENT & ALUMNI RELATIONS (SA)

Student life at SP is about balancing between coursework and social experiences. SA nurtures a holistic development for its students and groom them into responsible, resilient and caring individuals through the arts, sports, community service, CCAs, leadership and international enrichment programmes. These activities develop life skills of students to ensure that they are ready for the future. After graduation, the alumnus continues to be part of the community that testifies SP as a future ready institution.

CO-CURRICULAR ACTIVITIES

The provision of a balanced and well-rounded education is part of SP's mission to educate and train our students to excel in work and in life. Good academic grades alone are an insufficient gauge of student quality.

Co-curricular Activities (CCA) is an integral part of our education system and helps to develop soft skills such as creativity, leadership abilities, teamwork, flexibility, communication skills, resilience and an enterprising spirit.

ARTS

Arts coordinates artistic expression in SP, ranging from the performing arts to community arts. Through our numerous arts and culture-based clubs, you can learn a new musical instrument or dance form under qualified instructors. There are also plenty of opportunities to showcase your talents in our annual Arts Fiesta and participate in competitions, performances, arts and cultural exchange programmes overseas.

In addition, there are regular concerts and busking activities for students to demonstrate their craft.

GOSERVE

GoServe aims to develop students with a genuine desire to understand, care for and make a difference to the underprivileged community. The strong emphasis on contributing back to society and showing care and concern for the less privileged has resulted in numerous local and overseas community service projects spearheaded by our community service clubs and youth community leaders. We believe that every student has the capacity to serve and we encourage you to partner us in creating a caring and inclusive society.

LEADERS

Leaders seeks to develop a caring community of inspired leaders who are committed to serve with mastery. Our LEAP (Leadership) Programme encompasses a suite of exciting camps, customised workshops and inspiring talks to develop you more effectively in the areas of personal, team and servant leadership. It is our strong conviction that there is a leader in you and we will partner you in your leadership journey as you progress through the foundation, intermediate and advanced level all the way to achieving the National Youth Achievement Award (NYAA).

SPORTS@SP

Sports provides both recreational and competitive pursuits for students who are looking to be physically active. SP has more than 30 competitive sports teams that represent the polytechnic in major competitions like Institute-Varsity-Polytechnic (IVP) Championships, Polytechnic-ITE (POL-ITE) Games, national and invitational competitions, and overseas exchanges. SP also organises the annual mass sporting event Poly50, a run of over 50 laps involving staff & students. Through our Sports Education Program, we conduct sports workshops for student athletes and IPPT for final year NSeligible students. We are committed to developing well rounded student athletes who are competent in sports and individuals with strong character and good values.

ACTIVE

Besides sports excellence, SP also offers programmes to encourage students to lead an active and healthy lifestyle.

Sports for Life is a tiered programme where students may choose to pursue a particular sports module of their choice. The programme offers a wide array of sports like yoga, hip-hop, ultimate frisbee, rock climbing, swimming and laser tag.

Healthy Lifestyle Programme offers students workshops and talks ranging from self-defence and k-cardio to stress management and dental care.

These programmes aim to help students develop passion for sports and equip them with knowledge and skill sets to lead a well-balanced and active lifestyle beyond the classroom.

GO GLOBAL

SP has student exchange programmes in places like Japan and Hong Kong. These programmes aim to broaden the students' global perspective and appreciation of foreign cultures and languages. It also provides opportunities for students to establish friendships and learn more about the host country.

STUDENTS' UNION AND CLUB MEMBERSHIP

Full-time students are automatically ordinary members of the Students' Union as well as the academic club of their school. Part-time students are associate members of the Students' Union as well as the academic club of their school.

In addition to the Students' Union and academic clubs, there are more than 100 student clubs and competitive sports teams to choose from. These are broadly categorised under arts & culture, interest groups, leadership & service learning and sports & adventure.

SCHOLARSHIPS AND AWARDS

Students who have represented Singapore at the combined schools or higher level in either sports or arts may apply for the SP Sports & Arts Scholarship and Awards. The Scholarship grants are worth up to $2,000 per academic year.

SPORTS FACILITIES

SP is well equipped with a wide range of indoor and outdoor facilities. These facilities include an Olympic size swimming pool, a running track, multi purpose courts, multi purpose fields, a fitness gym, tennis courts, basketball courts and several aerobics/dance studios. With a rock wall standing at 30m high, SP also boosts one of the highest rock wall facility in Singapore.

STUDENT HUB@MOBERLY

The Student Hub is located in Moberly, the oldest site in SP. This historical building serves as a centre for students to engage in various recreational activities like jamming, dancing and playing pool. Students also get to enjoy facilities such as a café, dance studio, meeting and study areas.

Singapore Polytechnic (SP) has produced more than 195,000 graduates who have gone on to excel in their respective professions. Many of them are successful entrepreneurs, industry leaders and well-known professionals.

Connecting regularly with alumni and providing them with a platform to give back to their alma mater is an integral part of SA's role in alumni engagement. Through signature events such as the Poly 50 Campus Relay & Carnival and Alumni Homecoming Reunions, alumni can seize opportunities to network and rekindle old ties with former lecturers and schoolmates.

The Alumni Interest Groups (AIGs) caters to the varied interests of alumni and allows them to connect with one another. The quarterly e-newsletter represents the social media platform which SA uses to maintain regular contact with its alumni.

Alumni are welcome to give back by

- Conducting speaking engagements to share their industry experiences
- Mentoring their juniors
- Offering juniors with industrial training programme placement opportunities
- Volunteering for the many diverse community service projects
- Providing financial aid to students from humble backgrounds

For enquiries about student and alumni matters, please contact:

Singapore Polytechnic
Tel: 6775 1133
Email: contactus@sp.edu.sg
Website: life.sp.edu.sg

INTERNATIONAL STUDENTS

SP has a long tradition of welcoming international students. Each year, over 500 international students are admitted to a wide range of courses in SP providing the campus enrolment with rich cultural diversity and a stimulating learning environment.

Many international students have seized opportunities such as using the facilities and learning spaces available to them, to benefit richly from the experience of an overseas education. Every year, SP grooms champions and leaders from its cohort of international students.

We have a range of services to assist new international students to settle down to life in Singapore and SP. These include assistance with enrolment-related matters, international students orientation programme, mentoring scheme, social and recreational activities, as well as pastoral schemes and guidance support.

International students should contact the Student Service Centre upon, or even before, enrolment in the polytechnic for any assistance or information.

ADMISSIONS, FEES AND EXAMINATIONS

Please refer to the relevant sections in this Prospectus for more information on admission procedures, fees applicable to international students (including the provision of the Tuition Grant by the Singapore Government) and the examination system of the polytechnic.

IMMIGRATION – STUDENT'S PASS

International students must apply for a Student's Pass from the Immigration & Checkpoints Authority (ICA) upon admission to the Polytechnic. New applications for a Student's Pass must be submitted at least one month and not more than two months before the commencement of the course. Application must be done online through the Student's Pass Online Application and Registration (SOLAR) system, on the ICA's website (**www.ica.gov.sg**).

IMPORTANT — Please refer to the ICA website for full details on the SOLAR procedures and applicable fees.

Successful applicants will be issued with an In-Principle-Approval (IPA) letter by ICA through the polytechnic. For applicants who require a visa to enter Singapore, a visa will be incorporated in the IPA letter. Such students need not apply for a separate visa and may enter Singapore by producing the IPA letter at the checkpoints.

ITEM	MONTH	YEAR
Deposit per person on room rental (two months' rent – two to a room)		$1,000
Other initial expenses		$500
Group hospitalisation and surgical insurance		$50
Rent per person (two to a room)	$500	$6,000
Water, electricity and gas	$100	$1,200
Telecommunications and Internet	$100	$1,200
Food	$400	$4,800
Transport	$100	$1,200
Books/stationery/materials	$50	$600
Personal expenses	$150	1,800
TOTAL ESTIMATE	**$1,400**	**$18,350**

ESTIMATE OF LIVING EXPENSES

Living expenses vary according to individual lifestyles and means. The figures indicated above are estimates and serve as a reference only.

ARRIVAL IN SINGAPORE AND GETTING TO SP

Once accepted by the polytechnic, all international students will be given a copy of the Enrolment Guide. Information and advice on student services such as insurance, financial assistance, EZ-Link card and counselling that the Student Service Centre provides can be found in the guide.

ACCOMMODATION

Students may refer to the Classified Advertisements in the local Straits Times newspaper or various online websites for rooms to rent. Accommodation costs vary according to geographical area, type of accommodation, demand, facilities provided and the number of people sharing a room.

As there is a strong demand for accommodation and available units are taken up very quickly, students are advised to arrive as early as possible to secure their accommodation.

GROUP HOSPITALISATION AND SURGICAL INSURANCE

All full-time international students pursuing a diploma course in SP are required to purchase the Group Hospitalisation and Surgical Insurance Scheme arranged by the Student Service Centre. The premium is estimated at $34 per year. The scheme includes 24-hour worldwide coverage with maximum limit of S$30,000 per policy year.

Further details on the benefits and exclusions may be obtained from SP website.

PART-TIME/FULL-TIME WORK

Full-time diploma students are allowed to work part-time up to 16 hours per week during school term, and work full-time during vacation as the Ministry of Manpower has exempted them from applying for work permits. There is no necessity to obtain any permission from the polytechnic.

COUNSELLING SERVICES

As a student in a new country and learning environment, there may be times when there is a need for empathetic support and informed advice. Counselling offers the opportunity to work through your concerns and anxieties. All discussions are confidential unless consent is given for others to be involved. International students are encouraged to approach the Student Counsellors at the Student Service Centre should the need arise.

SP INTERNATIONAL STUDENTS' CLUB

As an international student, you should make it a point to join the International Students' Club (ISC). The ISC is made up of SP students of different nationalities and aims to provide a platform for international students in SP to meet fellow students from the same country, befriend students from other countries, and integrate with local students and local communities. Joining ISC will help you learn more about local cultures and settle down faster to life in Singapore and SP.

Contact ISC at

Email: spisc.adm@gmail.com
Facebook: https://www.facebook.com/spisc or simply search SP International Students' Club

ADMISSIONS AND COURSES

Each year, SP enrols around 5,000 school leavers into its 45 full-time diploma courses and the Common Engineering Programme.

ELIGIBILITY

Applicants can only be considered for admission if they:

a) satisfy the minimum academic requirements for the course,

b) are physically and mentally fit to pursue the course applied for,

c) are prepared to appear for interviews and to undergo any manual dexterity or aptitude tests if asked to do so, and

d) are of good character.

APPLICATION FOR ADMISSION

All applications must be submitted during the period prescribed. Applicants are personally responsible for providing accurate and complete information in their applications.

Successful applicants will have to present the originals of all educational and other appropriate documents for verification purposes at the enrolment exercise.

The acceptance of an application does not constitute any commitment by the Polytechnic to admit any candidate to a course in SP.

Successful applicants must accept the offer of admission within the period specified in the letter of offer, otherwise the offer is deemed to have lapsed and the vacancies would be offered to other applicants. SP may withdraw an offer of admission to any applicant or de-register a student who has made a false statement or withheld any information in his application for admission or during his enrolment.

Selection for admission lies solely within the discretion of the Polytechnic. SP also reserves the right to withdraw any course.

FULL-TIME COURSES

1. FULL-TIME DIPLOMA COURSES

The following full-time courses are offered to students who are able to devote their time to study and who are not attending any part-time courses or engaged in any employment, for remuneration or otherwise.

OTHER REQUIREMENTS AND CONDITIONS

a) **Aeronautical Engineering and Aerospace Electronics Courses**
It should be noted that applicants particularly those who wish to pursue a career as a Licensed Aircraft Engineer (LAE) who have severe colour vision deficiency, uncontrolled epilepsy and hearing deficiency may encounter difficulties meeting the course requirements and expectations. Interested applicants with mild deficiencies in these areas are advised to contact SP for consultation.

b) **Electrical and Electronics Engineering, Energy Systems and Management, and Engineering Systems Courses**
It should be noted that applicants, particularly those who wish to pursue a career in electrical power engineering or as a Licensed Electrical Worker (LEW), with colour vision deficiency may encounter difficulties meeting the course requirements and expectations, as normal colour vision is required by the Energy Market Authority (EMA) of Singapore. Those with mild colour deficiency are required to undergo an in-house test. Interested applicants with this condition are highly encouraged to contact SP for more information.

c) **Marine Engineering Course**
All candidates must pass the colour vision test as per The International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW).

d) **Nautical Studies Course**
Applicants who wish to apply for this course must ensure that they have good eyesight (visual acuity: unaided of 6/60 in both eyes and with visual aids of 6/6 in the better eye and at least 6/9 in the other eye).

Applicants must show proof of having passed the Maritime and Port Authority of Singapore (MPA) Sight Test which is conducted at the SP Optometry Centre or by General Practitioners.

All applicants must pass the colour vision test as per The International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW).

All applicants must be sponsored by a Singapore shipping company. Shortlisted candidates will be required to attend an interview conducted by the Singapore Maritime Academy. International students are required to find a Singapore shipping company of their choice that is prepared to offer them an internship for Phase 2 of this course.

e) **Optometry Course**
Applicants with severe vision impairment may encounter difficulties meeting the course requirements and expectations. Please refer to the Ministry of Health (MOH) website on "Fitness to Practice" for registered Optometrists. Interested applicants with this condition are highly encouraged to contact SP for more information.

A. SINGAPORE-CAMBRIDGE GCE 'O' LEVEL HOLDERS

The courses are of three-year duration. Applicants must offer the combination of subjects, as shown in the entry requirements table, taken at not more than two sittings of the Singapore-Cambridge GCE 'O' Level examinations:

Entry Requirements for Full-Time Diploma Courses (Singapore-Cambridge GCE 'O' Level / SPM / UEC)

See Tables 1A & 1B.

B. SINGAPORE-CAMBRIDGE GCE 'A' LEVEL HOLDERS

Applicants with GCE 'A' Level qualification who meet the entry requirements stipulated can be considered for direct entry into the second year of the appropriate three-year course, with bridging modules offered when deemed necessary by the School concerned. Applicants must offer the combination of subjects, shown in Table 2, taken at not more than two sittings of the same GCE 'A' Level examination. For all other courses, GCE 'A' Level holders may apply for three-year courses together with GCE 'O' Level holders. The number of places offered depends very much on the vacancies in the existing courses.

Entry Requirements for Full-Time Diploma Courses (Singapore-Cambridge GCE 'A' Level / STPM / UEC)

See Table 2.

C. HIGHER NATIONAL ITE CERTIFICATE (HIGHER NITEC) HOLDERS

Applicants who have obtained the Higher National ITE Certificate (Higher Nitec) with Grade Point Average (GPA) 2.0 and above may apply for admission to the three-year full-time courses appropriate to their ITE qualification.

Those with GPA 3.5 and above may apply for admission to the two-year full-time courses appropriate to their ITE qualification where available.

The entry qualifications are given in Table 3.

D. NATIONAL ITE CERTIFICATE (NITEC) HOLDERS

Applicants who have obtained the National ITE Certificate (Nitec) with Grade Point Average (GPA) 3.5 and above may apply for admission to the three-year full-time courses appropriate to their ITE qualification.

Applicants who have obtained the relevant Nitec with GPA 3.5 and above may apply for admission to the three-year full-time Diplomas in Digital Animation, and Visual Effects and Motion Graphics. Shortlisted candidates will be required to attend and pass an aptitude test cum interview with portfolio review.

The entry qualifications are given in Table 4.

E. FULL-TIME PROGRAMME IN NATIONAL CERTIFICATE IN CONSTRUCTION SUPERVISION (NCCS)

Applicants who have obtained the National Certificate in Construction Supervision may apply for admission to the appropriate full-time diploma courses.

The entry requirements are given in Table 5.

F. INTERNATIONAL QUALIFICATION HOLDERS

Applications from international qualification holders will be assessed based on their equivalence to the General Certificate of Education (GCE). Evidence of English Language proficiency will be required.

Applicants with qualifications from countries not listed in Table 6A are also invited to apply.

2. POLYTECHNIC FOUNDATION PROGRAMME

SINGAPORE-CAMBRIDGE GCE 'N' LEVEL HOLDERS

The Polytechnic Foundation Programme (PFP) is specially designed for top students of the 'N' Level (Academic) cohort. Instead of continuing with the 'O' Level examination in Secondary 5, students can join SP under this foundation programme to prepare them for their pre-selected diploma course. The PFP is a one-year full-time programme. Applicants must offer the combination of subjects as shown in the entry requirements table taken at the Singapore-Cambridge GCE 'N' Level examinations.

The entry requirements are given in Table 7.

ADMISSION EXERCISES

A. JOINT ADMISSIONS EXERCISE (JAE)

The Joint Admissions Exercise (JAE) applies to fresh Singapore-Cambridge GCE 'O' Level school leavers applying for admission to full-time diploma courses at SP. This JAE is coordinated by the Ministry of Education (MOE).

Information concerning the courses available and instructions for completion of the e-application can be found in the JAE 2018 Information Booklet. This booklet, published by MOE, is issued with Form A and is available from your secondary school.

Applicants can submit their online applications at SP as internet registration is available during the JAE. The JAE commences the same day as the release of the Singapore-Cambridge GCE 'O' Level results by MOE.

Course counselling is available at SP during the JAE. Applicants may visit SP's JAE website at **http://www.sp.edu.sg/jae**.

Applications must be submitted via the Internet at **https://www.moe.gov.sg/admissions/jae** during the JAE.

The Joint Admissions Board will notify the applicants of the outcome of the application as soon as it has been released. It will thus be unnecessary for the applicants to contact the Joint Admissions Board or SP before the release of the application results.

B. EARLY ADMISSIONS EXERCISE (EAE)

The Early Admissions Exercise (EAE) allows students to apply and receive conditional offers for admission to the Polytechnic based on their aptitudes and interests before taking their 'O' Level examinations. The EAE is open to:

a) Singapore Citizens and Permanent Residents who have registered to sit for the GCE 'O' Level examinations in the year of the EAE application, and

b) International students enrolled in Government, Government-aided and Independent School during the year of the EAE application, and who have registered to sit for the GCE 'O' Level examinations in the year of the EAE application.

Applicants are to submit their online application via **https://eae.polytechnic.edu.sg**.

C. JOINT POLYTECHNIC ADMISSIONS EXERCISE (JPAE)

The Joint Polytechnic Admissions Exercise (JPAE) is for applicants with the following qualifications:

a) Higher Nitec qualification with GPA 2.0 and above; and

b) Nitec qualification with GPA 3.5 and above.

Applicants are to submit their online application via **https://jpae.polytechnic.edu.sg**.

D. EARLY ADMISSIONS EXERCISE (ITE) [EAE(I)]

The Early Admissions Exercise (ITE) [EAE(I)] is opened to ITE students and they need not possess the relevant ITE qualification. Applicants are to submit their write-up on their passion and / or aptitude and any supporting evidence together with their application.

Applicants are to submit their online application via **https://eae.polytechnic.edu.sg**.

E. DIRECT ADMISSIONS EXERCISE (DAE)

The Direct Admissions Exercise (DAE) is for those wishing to apply for:

FULL-TIME DIPLOMA COURSES:

1) From local Singapore schools under Ministry of Education (MOE) mainstream School System:
   - in Integrated Programmes (IP) who have completed IP Year 4 (or Sec 4 equivalent) as well as those who have graduated from IP schools with IB / GCE 'A' Level results. Candidates must produce school results as well as IB / GCE 'A' Level results (if applicable) and recommendations (if any). Candidates may be required to undergo tests and / or interviews. Those who have not taken the GCE 'A' Level may apply upon the release of the GCE 'O' Level results in mid-January 2018 (coincides with the JAE). Those who have taken GCE 'A' Level whose results will be released later (February / March 2018) are to apply upon the release of the GCE 'A' Level results;
   - with IB qualification;
   - with Singapore-Cambridge GCE 'O' Level / ITE qualification who wish to apply for the Diploma in Nautical Studies course;
   - with Singapore-Cambridge GCE 'A' Level qualification. Application opens the day of release of GCE 'A' Level results and closes 5 days later.

2) From all local & international schools:
   - with GCSE / IGCSE / GCE 'O' Levels (non Singapore-Cambridge or other UK Boards);
   - with GCE 'A' Level qualification;
   - with Malaysia SPM / STPM / UEC qualifications

3) From local Polytechnics - ex-polytechnic students.

Application website:
http://courseapplication.sp.edu.sg.

Note:
GCE 'O' Level holders who have applied through the JAE and the EAE may not apply again through SP's DAE (except for those applying for the Nautical Studies course). Otherwise, their DAE application will be invalidated.

F. POLYTECHNIC FOUNDATION PROGRAMME ADMISSIONS EXERCISE (PFPAE)

The Polytechnic Foundation Programme Admissions Exercise (PFPAE) is open only to top students of the 'N' Level (Academic) cohort. Eligible applicants will be invited to apply for the polytechnic diploma courses under the PFPAE. Eligible applicants may submit their application via **https://pfp.polytechnic.edu.sg**.

WITHDRAWAL FROM COURSES

A student who intends to discontinue with his / her studies must inform the Admissions Office by submitting a "Notification of Withdrawal from Course" form. This form is available at the Student Service Centre (SSC), respective academic school office and on the Internet at **http://www.sp.edu.sg/ssc**. The student should also read the section on "Charging of Fees" for information regarding their course fees.

APPLICATION FOR CLASS TRANSFER

Requests for class transfers from current SP students may be considered subject to individual merit and vacancies. Applications must be made before the commencement of each academic semester through application forms available from the SSC, the respective academic school office and on the internet at **http://www.sp.edu.sg/ssc**. The student must continue to attend the class to which he has been originally assigned pending the result of his application.

APPLICATION FOR COURSE TRANSFER

New students who wish to transfer to another course may submit a SP e-Appeal via **http://courseapplication.sp.edu.sg**. Such appeals may be considered subject to individual merit and vacancies.

For current SP students, only those who have sat for and passed the semestral examinations may apply and is subject to individual merit and vacancies. Application forms are available from the SSC, the respective academic school office and on the Internet at **http://www.sp.edu.sg/ssc**. The student must continue to attend his original course of study pending the result of his application.

LEAVE OF ABSENCE

Students who are unable to attend classes / lectures / workshops / assessments may apply for leave of absence by submitting an online form. This online form may be accessed from the Student Portal e-Services page and must be submitted **two weeks prior** to the leave of absence period applied for.

For leave of absence from class / test / assessment due to illness, the medical certificate (MC) must be submitted **within two working days** after the stipulated MC period.

Students are not to assume that their application for leave of absence has been approved. They should check the Student Portal or iChat email for the application status closer to the period applied for. They must check with their respective Schools should they have any doubts.

APPLICATION FOR MODULE EXEMPTION

Applications will be considered only at the commencement of each academic semester. Application forms are obtainable from the SSC, the respective academic school office and on the Internet at **http://www.sp.edu.sg/ssc**.

All applications must be submitted to the respective academic school office within 3 weeks (i.e. from the week before to 2 weeks after the semester commences).

EMPLOYMENT FOR FULL-TIME INTERNATIONAL STUDENTS

Full-time international students are allowed to work part-time of up to 16 hours per week during school term and work full time during vacation as the Ministry of Manpower has exempted them from applying for work permits. There is no necessity to obtain any permission from SP.

TABLE 1A: ENTRY REQUIREMENTS FOR FULL-TIME DIPLOMA COURSES (GCE 'O' LEVEL / SPM / UEC HOLDERS) - 2018/2019 SESSION

Entry Requirements at GCE 'O' Level / SPM / UEC	Aeronautical Engineering [2]	Aerospace Electronics [2]	Applied Chemistry [6]	Bioengineering	Biomedical Science [1]	Biotechnology	Chemical Engineering	Civil Engineering with Business	Common Engineering Programme [7]	Computer Engineering	Electrical & Electronic Engineering [3]	Energy Systems and Management [3]	Engineering Systems [3]	Engineering with Business	Facilities Management	Food Science & Technology	Integrated Events & Project Management	Marine Engineering [5]	Mechanical Engineering	Mechatronics and Robotics	Nutrition, Health & Wellness	Optometry [4]	Perfumery and Cosmetic Science	Business Information Technology	Financial Informatics	Infocomm Security Management	Information Technology	Maritime Business	Music & Audio Technology
English *	1 - 7																							1 - 7					
	and																							and					
Mathematics (Elementary/Additional)	1 - 6																							1 - 6					
	and one of the following subjects																							and					
Biology Biotechnology Chemistry Combined Science Physical Science Physics / Engineering Science Science (Chemistry, Biology) Science (Physics, Biology) Science (Physics, Chemistry)	1 - 6	1 - 6	1 - 6	1 - 6	1 - 6	1 - 6	1 - 6	1 - 6	1 - 6	1 - 6	1 - 6	1 - 6	1 - 6	1 - 6	1 - 6	1 - 6	1 - 6	1 - 6	1 - 6	1 - 6	1 - 6	1 - 6	1 - 6	'1 - 6 in any two other subjects#					
Computer Studies	1 - 6	1 - 6		1 - 6				1 - 6	1 - 6	1 - 6	1 - 6	1 - 6	1 - 6	1 - 6	1 - 6		1 - 6	1 - 6	1 - 6	1 - 6									
Design & Technology	1 - 6	1 - 6		1 - 6			1 - 6	1 - 6	1 - 6	1 - 6	1 - 6	1 - 6	1 - 6	1 - 6	1 - 6		1 - 6	1 - 6	1 - 6	1 - 6									
Design Studies															1 - 6#		1 - 6#												
Food & Nutrition			1 - 6		1 - 6	1 - 6										1 - 6					1 - 6	1 - 6	1 - 6						
Fundamentals of Electronics	1 - 6	1 - 6		1 - 6				1 - 6	1 - 6	1 - 6	1 - 6	1 - 6	1 - 6	1 - 6	1 - 6		1 - 6	1 - 6	1 - 6	1 - 6									
Art / Art & Design Higher Art															1 - 6#		1 - 6#												

Example of how to read the entry requirement table above. The entry requirements for the Mechanical Engineering course are:

English	Grade 1 - 7
Mathematics / Additional Mathematics	Grade 1 - 6
and One of the following subjects:	Grade 1 - 6

Biology
Biotechnology
Chemistry
Combined Science
Computer Studies
Design & Technology
Fundamentals of Electronics
Physical Science
Physics / Engineering Science
Science (Chemistry, Biology)
Science (Physics, Biology)
Science (Physics, Chemistry)

Note: CCA cannot be used to meet the minimum entry requirements.

1 The 1st year of the Biomedical Science course is common and at the end of Year 1, students opt for one of the following programmes:
Biomedical Science (Biomedical Research)
Biomedical Science (Cardiac Technology)
Biomedical Science (Medical Technology)

2 It should be noted that applicants particularly those who wish to pursue a career as a Licensed Aircraft Engineer (LAE) who have severe colour vision deficiency, uncontrolled epilepsy and hearing deficiency may encounter difficulties meeting the course requirements and expectations. Interested applicants with mild deficiencies in these areas are advised to contact SP for consultation.

3 It should be noted that applicants, particularly those who wish to pursue a career in electrical power engineering or as a Licensed Electrical Worker (LEW), with colour vision deficiency may encounter difficulties meeting the course requirements and expectation, as normal colour vision is required by the Energy Market Authority (EMA) of Singapore. Those with mild colour deficiency are required to undergo an in-house test. Interested applicants with this condition are highly encouraged to contact SP for more information.

4 Applicants with severe vision impairment may encounter difficulties meeting the course requirements and expectations. Please refer to the Ministry of Health (MOH) website on "Fitness to Practice" for registered Optometrists.
Interested applicants with this condition are highly encouraged to contact SP for more information.

5 All candidates must pass the colour vision test as per The International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW).

6 At the end of Year 2, students opt for one of the following programmes:
Applied Chemistry (Industrial Chemistry)
Applied Chemistry (Materials Science)
Applied Chemistry (Medicinal Chemistry Research)
Applied Chemistry (Pharmaceutical Science)

7 At the end of the first semester, students will opt for one of the following courses (must satisfy the respective course entry requirements) :
Aeronautical Engineering [2]
Aerospace Electronics [2]
Bioengineering
Computer Engineering
Electrical & Electronic Engineering [3]
Energy Systems and Management [3]
Mechanical Engineering
Mechatronics and Robotics

* Applicants offering SPM qualification, must attain a minimum grade A+ to C for their Bahasa Inggeris (1119). This is applicable for all courses except for the Creative Writing for Television and New Media, and Media and Communication courses which require a minimum grade A+ to A-.

Applicants offering UEC qualification, must attain a minimum grade 6 for their English Language. This is applicable for all courses except for the Creative Writing for Television and New Media, and Media and Communication courses which require a minimum grade 2.

SPM Grade	Equivalent GCE 'O' Level Grade
A+ to C	1 to 6
A+ to D	1 to 7

To be eligible for admission, you must have also sat for one of the following subjects:

Additional Combined Science
Additional Science
Biology
Biotechnology
Chemistry
Combined Science
Computer Studies
Creative 3D Animation
Design & Technology
Engineering Science
Food & Nutrition
Fundamentals of Electronics
General Science
Human & Social Biology
Integrated Science
Physical Science
Physics
Science (Chemistry, Biology)
Science (Physics, Biology)
Science (Physics, Chemistry)
Science (Physics, Chemistry, Biology)

TABLE 1B: ENTRY REQUIREMENTS FOR FULL-TIME DIPLOMA COURSES (GCE 'O' LEVEL / SPM / UEC HOLDERS) - 2018/2019 SESSION

Entry Requirements at GCE 'O' Level / SPM / UEC	Architecture	Digital Animation	Experience and Product Design	Games Design and Development	Interior Design	Landscape Architecture	Visual Communication and Media Design	Visual Effects and Motion Graphics	Applied Drama and Psychology	Creative Writing for Television and New Media	Media and Communication	Accountancy	Banking and Finance	Business Administration	Human Resource Management with Psychology	Tourism and Resort Management	Nautical Studies [1]
English *	1 - 7	1 - 7	1 - 7	1 - 7	1 - 7	1 - 7	1 - 6	1 - 7	1 - 6	1 - 4	1 - 4	1 - 6					1 - 7
	and								and			and					and
Mathematics (Elementary/Additional)	1 - 7	1 - 7	1 - 7	1 - 6	1 - 7	1 - 7	1 - 7	1 - 7	1 - 7			1 - 6					1 - 6
	and								and			and					and
	1 - 6 in any two other subjects. Note: To be eligible for admission, you must also have sat for one of the following subjects: Additional Combined Science Additional Science Art / Art & Design Biology Biotechnology Chemistry Combined Science Computer Studies Creative 3D Animation Design & Technology Design Studies Engineering Science Food & Nutrition Fundamentals of Electronics General Science Higher Art Human & Social Biology Integrated Science Media Studies (Chinese) Media Studies (English) Physical Science Physics Science (Chemistry, Biology) Science (Physics, Biology) Science (Physics, Chemistry) Science (Physics, Chemistry, Biology)								1 - 6 in any three other subjects. Note: To be eligible for admission, you must also have sat for: one subject listed in the 1st group of relevant subjects [2] and another different subject listed in the 2nd group of relevant subjects [3]			1 - 6 in any three other subjects. Note: To be eligible for admission, you must also have sat for one of the following subjects: Art/Art & Design Business Studies Combined Humanities Commerce Commercial Studies Economics Geography Higher Art Higher Music History Media Studies (Chinese) Media Studies (English) Music Principles of Accounts Introduction to Enterprise Development Literature in English/Chinese/Malay/Tamil					1 - 6 in any two other subjects [4]

Note: CCA cannot be used to meet the minimum entry requirements.

[1] Diploma course in Nautical Studies :
Phase 1 : Pre-Sea Induction (18 months)
Phase 2 : Sea Training / Correspondence (12 months)
Phase 3 : Full-Time Studies at SP (6 months)

- Applicants must ensure that they have good eyesight (i.e. visual acuity unaided of 6/60 in both eyes and with visual aids of 6/6 in the better eye and at least 6/9 in the other eye). Applicants must show proof of having passed the Maritime and Port Authority of Singapore (MPA) Sight Test which is conducted at the Singapore Polytechnic Optometry Centre or by General Practitioners.
- All applicants must pass the colour vision test as per The International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW).
- All applicants must be sponsored by a Singapore shipping company. Shortlisted candidates will be required to attend an interview conducted by the Singapore Maritime Academy. International students are required to find a Singapore shipping company of their choice that is prepared to offer them an internship for phase 2 of this course.

[2] **1st Group of Relevant Subjects:**

Art/Art & Design
Business Studies
Combined Humanities
Commerce
Commercial Studies
Economics
Geography
Higher Art
Higher Music
History
Introduction to Enterprise Development
Literature in English/Chinese/Malay/Tamil
Media Studies (Chinese)
Media Studies (English)
Music

[3] **2nd Group of Relevant Subjects:**

Additional Mathematics
Art/Art & Design
Business Studies
Chinese
Combined Humanities
Commerce
Commercial Studies
Creative 3D Animation
Design & Technology
Design Studies
Economics
Elementary Mathematics
Food & Nutrition
Geography
Higher Art
Higher Chinese
Higher Malay
Higher Music
Higher Tamil
History
Introduction to Enterprise Development
Literature in English/Chinese/Malay/Tamil
Malay
Media Studies (Chinese)
Media Studies (English)
Music
Principles of Accounts
Tamil

[4] **To be eligible for admission, you must have also sat for one of the following subjects:**

Additional Combined Science
Additional Science
Biology
Biotechnology
Chemistry
Combined Science
Computer Studies
Creative 3D Animation
Design & Technology
Engineering Science
Food & Nutrition
Fundamentals of Electronics
General Science
Human & Social Biology
Integrated Science
Physical Science
Physics
Science (Chemistry, Biology)
Science (Physics, Biology)
Science (Physics, Chemistry)
Science (Physics, Chemistry, Biology)

* Applicants offering SPM qualification, must attain a minimum grade A+ to C for their Bahasa Inggeris (1119). This is applicable for all courses except for the Creative Writing for Television and New Media, and Media and Communication courses which require a minimum grade A+ to A-.

Applicants offering UEC qualification, must attain a minimum grade 6 for their English Language. This is applicable for all courses except for the Creative Writing for Television and New Media, and Media and Communication courses which require a minimum grade 2.

SPM Grade	Equivalent GCE 'O' Level Grade
A+ to C	1 to 6
A+ to D	1 to 7

TABLE 2: ENTRY REQUIREMENTS FOR FULL-TIME DIPLOMA COURSES (GCE 'A' LEVEL / STPM / UEC HOLDERS) - 2018/2019 SESSION

	GCE 'A' LEVEL / STPM	UEC
Entry Requirements at GCE 'A' Level / STPM / UEC	Civil Engineering with Business	Civil Engineering with Business
For GCE 'A' Level / STPM holders: General Paper (English Medium) or Knowledge & Inquiry	A - E	
For UEC holders: English Language		1 - 6
	and	and
Any Mathematics subject (H2 Level)	A - E	1 - 6
	and one of the following subjects (H2 Level)	and one of the following subjects
Physical Science	A - E	
Physics	A - E	1 - 6
Chemistry		1 - 6
Biology		1 - 6

Note: All successful applicants will be admitted to the 2nd year of the above 3-year course. For all other courses not in the above table, entry will be based on your GCE 'O' Level / SPM qualifications (refer to Tables 1A & 1B)

TABLE 3: ENTRY REQUIREMENTS FOR FULL-TIME DIPLOMA COURSES (HIGHER NITEC HOLDERS WITH GPA 2.0 AND ABOVE) - 2018/2019 SESSION

Full-Time Diploma Courses to be applied through the Joint Polytechnic Admissions Exercise (JPAE) in February 2018 at **http://www.polytechnic.edu.sg/jpae**	BS81	BS82	BS83	BS84	BS85	BS86	BS87	BS88	BS89	BS90	BS91	BS92	BS93	BS94	BS95	BS96	BS97	BS98	BS99
Accountancy		✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓				✓
Aeronautical Engineering [1]																			
Aerospace Electronics [1]																			
Applied Chemistry [5]																			
Architecture																			
Banking & Finance		✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓				✓
Bioengineering																			
Biomedical Science [5]																			
Biotechnology [5]																			
Business Administration		✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓				✓
Business Information Technology		✓		✓	✓	✓		✓	✓	✓									
Chemical Engineering [5]																			
Civil Engineering with Business																			
Computer Engineering																			
Electrical & Electronic Engineering [2]																			
Energy Systems & Management [2]																			
Engineering Systems [2]																			
Engineering with Business																			
Experience & Product Design												✓							
Facilities Management				✓	✓	✓	✓	✓	✓	✓									
Financial Informatics		✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓				✓
Food Science & Technology [5]																			
Games Design and Development																			
Human Resource Management with Psychology		✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓				✓
Infocomm Security Management																			
Information Technology																			
Integrated Events & Project Management	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Interior Design												✓							
Landscape Architecture																			
Marine Engineering [3]																			
Maritime Business		✓			✓	✓	✓	✓	✓			✓	✓	✓	✓	✓			✓
Mechanical Engineering																			
Mechatronics and Robotics																			
Nutrition, Health & Wellness [5]																			
Perfumery and Cosmetic Science [5]																			
Tourism and Resort Management		✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓			✓	✓
Visual Communication and Media Design												✓					✓		

Full-Time Diploma Courses to be applied through Direct Admissions Exercise (DAE) in Jan 2018 at **http://www.sp.edu.sg/dae**	BS81	BS82	BS83	BS84	BS85	BS86	BS87	BS88	BS89	BS90	BS91	BS92	BS93	BS94	BS95	BS96	BS97	BS98	BS99
Digital Animation [4]	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Nautical Studies [6]		✓			✓	✓	✓	✓	✓			✓	✓		✓	✓			
Visual Effects & Motion Graphics [4]	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

✓ Unless otherwise stated, Higher Nitec Qualification holder with GPA of 2.0 or more is eligible to apply for this course.

[A] Unless otherwise stated, Higher Nitec Qualification holder with GPA of 2.0 or more is eligible to apply for this course. Those with GPA of 3.5 or more and passed the Bridging Maths 1 (BM1) programme, or have obtained at least C6 grade in GCE 'O' Level Mathematics, may be admitted to the 2nd year of a 3 year course.

TABLE 3: TABLE 3: ENTRY REQUIREMENTS FOR FULL-TIME DIPLOMA COURSES (HIGHER NITEC HOLDERS WITH GPA 2.0 AND ABOVE) - 2018/2019 SESSION *(CONTINUED)*

Full-Time Diploma Courses to be applied through the Joint Polytechnic Admissions Exercise (JPAE) in February 2018 at **http://www.polytechnic.edu.sg/jpae**	IT21	IT22	IT31	IT41	IT50	IT51	IT52	IT54	IT55	IT56	IT57	IT58	IT59	IT60	IT61	IT62	IT63	IT64	IT65	IT66
Accountancy										✓								✓	✓	
Aeronautical Engineering [1]	A	A	✓	✓	A	A	A	A	A			✓		✓						
Aerospace Electronics [1]	✓	✓	✓	✓						✓										
Applied Chemistry [5]												✓	✓							
Architecture																	✓			
Banking & Finance										✓								✓	✓	
Bioengineering	A	A	✓	✓	A	A	A	A	A			✓		✓						
Biomedical Science [5]												✓	✓							
Biotechnology [5]												✓	✓							
Business Administration										✓								✓	✓	
Business Information Technology										✓	✓				✓		✓	✓		
Chemical Engineering [5]												✓	✓							
Civil Engineering with Business		✓	✓	✓		✓	✓		✓	✓				✓						
Computer Engineering	A	A	A	A		✓	✓		✓	✓	✓				✓					✓
Electrical & Electronic Engineering [2]	A	A	A	A		✓	✓		✓	✓	✓				✓					✓
Energy Systems & Management [2]	✓	✓	✓	✓		✓	✓		✓	✓										
Engineering Systems [2]	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					✓
Engineering with Business	✓	✓	✓	✓		✓	✓		✓	✓										
Experience & Product Design																	✓			
Facilities Management		✓	✓	✓		✓	✓		✓	✓									✓	
Financial Informatics										✓								✓	✓	
Food Science & Technology [5]												✓	✓							
Games Design and Development										✓							✓			
Human Resource Management with Psychology										✓								✓	✓	
Infocomm Security Management										✓	✓				✓					
Information Technology				✓						✓	✓				✓		✓	✓		✓
Integrated Events & Project Management	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Interior Design																	✓			
Landscape Architecture																	✓			
Marine Engineering [3]	✓	✓	✓	✓	✓	✓	✓	✓	✓					✓						
Maritime Business	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓					
Mechanical Engineering	A	A	✓	✓	A	A	A	A	A			✓		✓						
Mechatronics and Robotics	A	A	A	A	A	A	A	A	A			✓		✓						
Nutrition, Health & Wellness [5]												✓	✓							
Perfumery and Cosmetic Science [5]												✓	✓							
Tourism and Resort Management										✓								✓	✓	
Visual Communication and Media Design																				

Full-Time Diploma Courses to be applied through Direct Admissions Exercise (DAE) in Jan 2018 at **http://www.sp.edu.sg/dae**	IT21	IT22	IT31	IT41	IT50	IT51	IT52	IT54	IT55	IT56	IT57	IT58	IT59	IT60	IT61	IT62	IT63	IT64	IT65	IT66
Digital Animation [4]	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Nautical Studies [6]	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓					
Visual Effects & Motion Graphics [4]	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

✓ Unless otherwise stated, Higher Nitec Qualification holder with GPA of 2.0 or more is eligible to apply for this course.

[A] Unless otherwise stated, Higher Nitec Qualification holder with GPA of 2.0 or more is eligible to apply for this course. Those with GPA of 3.5 or more and passed the Bridging Maths 1 (BM1) programme, or have obtained at least C6 grade in GCE 'O' Level Mathematics, may be admitted to the 2nd year of a 3 year course.

TABLE 3: ENTRY REQUIREMENTS FOR FULL-TIME DIPLOMA COURSES (HIGHER NITEC HOLDERS WITH GPA 2.0 AND ABOVE) - 2018/2019 SESSION *(CONTINUED)*

Full-Time Diploma Courses to be applied through the Joint Polytechnic Admissions Exercise (JPAE) in February 2018 at **http://www.polytechnic.edu.sg/jpae**	IT67	IT68	IT69	IT70	IT71	IT72	IT73	IT74	IT75	IT76	IT77	IT78	IT80	IT81	IT82	IT83	IT84	IT85	IT86	IT87
Accountancy										✓		✓								
Aeronautical Engineering [1]	✓	✓			✓	✓	A	✓	A		✓							✓	✓	
Aerospace Electronics [1]								✓			✓									
Applied Chemistry [5]																				
Architecture	✓												✓		✓					
Banking & Finance										✓		✓								
Bioengineering	✓	✓			✓	✓	A	✓	A		✓							✓	✓	
Biomedical Science [5]																				
Biotechnology [5]																				
Business Administration										✓		✓								
Business Information Technology										✓						✓				
Chemical Engineering [5]						✓														
Civil Engineering with Business	✓	✓			✓	✓												✓	✓	
Computer Engineering								✓		✓	✓								✓	
Electrical & Electronic Engineering [2]		✓						✓			✓								✓	
Energy Systems & Management [2]		✓						✓			✓								✓	
Engineering Systems [2]	✓	✓			✓	✓		✓	✓		✓								✓	
Engineering with Business								✓	✓	✓	✓									
Experience & Product Design																				
Facilities Management	✓	✓									✓									
Financial Informatics										✓		✓								
Food Science & Technology [5]																				
Games Design and Development															✓					
Human Resource Management with Psychology										✓		✓								
Infocomm Security Management				✓						✓										
Information Technology			✓	✓						✓						✓				
Integrated Events & Project Management	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Interior Design													✓							
Landscape Architecture	✓														✓					
Marine Engineering [3]					✓		✓	✓												
Maritime Business	✓	✓	✓	✓	✓	✓	✓			✓		✓								
Mechanical Engineering	✓	✓			✓	✓	A	✓	A		✓							✓	✓	
Mechatronics and Robotics	✓	✓			✓	✓	A	✓	A		✓							✓	✓	
Nutrition, Health & Wellness [5]																				
Perfumery and Cosmetic Science [5]																				
Tourism and Resort Management										✓		✓								
Visual Communication and Media Design																				

Full-Time Diploma Courses to be applied through Direct Admissions Exercise (DAE) in Jan 2018 at **http://www.sp.edu.sg/dae**	IT67	IT68	IT69	IT70	IT71	IT72	IT73	IT74	IT75	IT76	IT77	IT78	IT80	IT81	IT82	IT83	IT84	IT85	IT86	IT87
Digital Animation [4]	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Nautical Studies [6]	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓								
Visual Effects & Motion Graphics [4]	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

✓ Unless otherwise stated, Higher Nitec Qualification holder with GPA of 2.0 or more is eligible to apply for this course.

A Unless otherwise stated, Higher Nitec Qualification holder with GPA of 2.0 or more is eligible to apply for this course. Those with GPA of 3.5 or more and passed the Bridging Maths 1 (BM1) programme, or have obtained at least C6 grade in GCE 'O' Level Mathematics, may be admitted to the 2nd year of a 3 year course.

TABLE 3: ENTRY REQUIREMENTS FOR FULL-TIME DIPLOMA COURSES (HIGHER NITEC HOLDERS WITH GPA 2.0 AND ABOVE) - 2018/2019 SESSION *(CONTINUED)*

Note: From 2003, ITE graduates can include their CCA points in their GPA to gain admission.

[1] It should be noted that applicants particularly those who wish to pursue a career as a Licensed Aircraft Engineer (LAE) who have severe colour vision deficiency, uncontrolled epilepsy and hearing deficiency may encounter difficulties meeting the course requirements and expectations. Interested applicants with mild deficiencies in these areas are advised to contact SP for consultation.

[2] It should be noted that applicants, particularly those who wish to pursue a career in electrical power engineering or as a Licensed Electrical Worker (LEW), with colour vision deficiency may encounter difficulties meeting the course requirements and expectations, as normal colour vision is required by the Energy Market Authority (EMA) of Singapore. Those with mild colour deficiency are required to undergo an in-house test. Interested applicants with this condition are highly encouraged to contact SP for consultation.

[3] All candidates must pass the colour vision test as per The International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW).

[4] Applicants must possess at least grade point average (GPA) of 3.0, if shortlisted, applicants would be required to attend and pass an aptitude test cum interview with portfolio review.

[5] Applicants must possess at least grade point average (GPA) of 3.0.

[6] Applicants must ensure that they have good eyesight (i.e. visual acuity unaided of 6/60 in both eyes and with visual aids of 6/6 in the better eye and at least 6/9 in the other eye). Applicants must also pass the colour vision test as per The International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW). Any offer of admission will be conditional upon applicants showing proof of having passed the Maritime and Port Authority of Singapore (MPA) Sight Test which is conducted at the SP Optometry Centre or by General Practitioners. All applicants must be sponsored by a Singapore shipping company. Shortlisted candidates will be required to attend an interview conducted by the Singapore Maritime Academy. International students are required to find a Singapore shipping company of their choice that is prepared to offer them an internship for Phase 2 of this course.

For information on the courses conducted by Singapore Polytechnic, please visit **http://www.sp.edu.sg**.

IT75	Advanced Manufacturing / Engineering with Business	BS83	Hospitality Operations
IT74	Aerospace Engineering	BS99	Human Resource & Administration
IT50	Air-Conditioning & Refrigeration Engineering	IT69	Information Systems Quality
BS82	Banking Services	IT56	Information Technology
BS91	Beauty & SPA Management	IT84	Interactive Design
IT58	Biotechnology / Biochemical Technology	IT87	Landscape Management & Design
IT81	Broadcast & Media Technology	IT65	Leisure & Travel Operations
IT64	Business Information Systems	IT55	Manufacturing Engineering
BS85	Business Studies (Accounting) / Accounting	IT60	Marine & Offshore Technology / Marine Offshore Engineering
BS86	Business Studies (Administration / Secretarial)	IT73	Marine Engineering
BS88	Business Studies (E-Commerce) / Business-Information Technology	IT51	Mechanical & Electrical Engineering Design / Mechanical & Electrical Drafting & Design
BS84	Business Studies (Event Management)	IT52	Mechanical Engineering
BS87	Business Studies (Logistics) / Integrated Logistics Management / Logistics for Int'l Trade	IT54	Mechanical Engineering Drawing & Design
BS90	Business Studies (Service Management) / Service Management	IT22	Mechatronics Engineering
BS89	Business Studies (Sport Management) / Sport Management	IT70	Mobile Unified Communications
IT59	Chemical Technology	IT61	Network Security Technology / Cyber & Networking Security
IT67	Civil & Structural Engineering Design	IT71	Offshore & Marine Engineering Design
BS93	Community Sport & Recreation Management	IT62	Paramedic & Emergency Care
IT76	E-Business Programming	BS95	Passenger Services
BS81	Early Childhood Education	BS96	Performance Production
IT31	Electrical Engineering	IT85	Precision Engineering
IT21	Electro - Mechanical Engineering	IT72	Process Plant Design
IT41	Electronics Engineering / Industrial Electronics Engineering	IT86	Rapid Transit Engineering
BS98	Event Management	BS94	Retail Merchandising
IT77	Facility Management	IT66	Security System Integration
IT68	Facility Systems Design	IT78	Shipping & Operations Services
BS97	Filmmaking (Cinematography)	IT80	Space Design Technology
IT82	Games Art & Design	BS92	Visual Merchandising
IT63	Games Design & Development	IT57	Wireless Technology
IT83	Games Programming & Development		

TABLE 4: ENTRY REQUIREMENTS FOR FULL-TIME DIPLOMA COURSES (NITEC HOLDERS WITH GPA 3.5 AND ABOVE) - 2018/2019 SESSION

Full-Time Diploma Courses to be applied through the Joint Polytechnic Admissions Exercise (JPAE) in February 2018 at **http://www.polytechnic.edu.sg/jpae**	NT21	NT23	NT24	NT25	NT26	NT27	NT28	NT29	NT30	NT31	NT32	NT37	NT38	NT39	NT40	NT41	NT42	NT43
Aeronautical Engineering [1]		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓
Aerospace Electronics [1]			✓															
Applied Chemistry														✓				
Architecture	✓																	
Bioengineering		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓
Chemical Engineering														✓				
Civil Engineering with Business	✓	✓											✓					
Computer Engineering			✓	✓	✓	✓							✓		✓			
Electrical & Electronic Engineering [2]			✓	✓	✓	✓							✓	✓	✓			
Energy Systems & Management [2]			✓	✓	✓	✓							✓					
Engineering Systems [2]		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓
Engineering with Business			✓															
Experience & Product Design																		
Facilities Management	✓	✓											✓					
Food Science & Technology														✓				
Games Design and Development																✓		
Infocomm Security Management			✓												✓	✓		
Information Technology															✓	✓		
Integrated Events & Project Management	✓	✓											✓					
Interior Design	✓																	
Landscape Architecture	✓																	
Marine Engineering [3]			✓	✓	✓	✓	✓	✓	✓	✓	✓						✓	
Maritime Business																	✓	
Mechanical Engineering		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓
Mechatronics and Robotics		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓
Nutrition, Health & Wellness														✓				
Optometry [4]																		
Perfumery and Cosmetic Science														✓				
Visual Communication and Media Design																✓		

Full-Time Diploma Courses to be applied through Direct Admissions Exercise (DAE) in Jan 2018 at **http://www.sp.edu.sg/dae**	NT21	NT23	NT24	NT25	NT26	NT27	NT28	NT29	NT30	NT31	NT32	NT37	NT38	NT39	NT40	NT41	NT42	NT43
Digital Animation [5]																✓		
Nautical Studies [6]			✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓
Visual Effects & Motion Graphics [5]																✓		

✓ Nitec Qualification holder with GPA of 3.5 and above is eligible to apply for this course.

TABLE 4: ENTRY REQUIREMENTS FOR FULL-TIME DIPLOMA COURSES (NITEC HOLDERS WITH GPA 3.5 AND ABOVE) - 2018/2019 SESSION *(CONTINUED)*

Full-Time Diploma Courses to be applied through the Joint Polytechnic Admissions Exercise (JPAE) in February 2018 at **http://www.polytechnic.edu.sg/jpae**	NT44	NT46	NT47	NT48	NT49	NT50	NT51	NT52	NT53	NT54	NT56	NT57	NT58	NT59	NT60	NT61	NT62	NT63
Aeronautical Engineering [1]				✓		✓	✓		✓					✓			✓	✓
Aerospace Electronics [1]			✓						✓					✓	✓			
Applied Chemistry																		
Architecture		✓														✓		
Bioengineering				✓		✓	✓		✓					✓			✓	✓
Chemical Engineering																		
Civil Engineering with Business																		✓
Computer Engineering			✓											✓	✓			✓
Electrical & Electronic Engineering [2]			✓		✓				✓			✓		✓	✓			✓
Energy Systems & Management [2]						✓								✓	✓			✓
Engineering Systems [2]		✓		✓	✓	✓	✓		✓			✓		✓	✓		✓	✓
Engineering with Business			✓						✓						✓			
Experience & Product Design		✓																
Facilities Management																✓		✓
Food Science & Technology													✓					
Games Design and Development	✓							✓		✓								
Infocomm Security Management												✓						
Information Technology												✓						
Integrated Events & Project Management																		✓
Interior Design		✓																
Landscape Architecture		✓														✓		
Marine Engineering [3]				✓											✓			
Maritime Business																		
Mechanical Engineering				✓		✓	✓		✓					✓			✓	✓
Mechatronics and Robotics				✓		✓	✓		✓					✓			✓	✓
Nutrition, Health & Wellness													✓					
Optometry [4]																		
Perfumery and Cosmetic Science																		
Visual Communication and Media Design	✓							✓		✓	✓							

Full-Time Diploma Courses to be applied through Direct Admissions Exercise (DAE) in Jan 2018 at **http://www.sp.edu.sg/dae**	NT44	NT46	NT47	NT48	NT49	NT50	NT51	NT52	NT53	NT54	NT56	NT57	NT58	NT59	NT60	NT61	NT62	NT63
Digital Animation [5]	✓	✓						✓		✓	✓							
Nautical Studies [6]				✓											✓			✓
Visual Effects & Motion Graphics [5]	✓	✓						✓		✓	✓							

✓ Nitec Qualification holder with GPA of 3.5 and above is eligible to apply for this course.

TABLE 4: ENTRY REQUIREMENTS FOR FULL-TIME DIPLOMA COURSES (NITEC HOLDERS WITH GPA 3.5 AND ABOVE) - 2018/2019 SESSION *(CONTINUED)*

Full-Time Diploma Courses to be applied through the Joint Polytechnic Admissions Exercise (JPAE) in February 2018 at **http://www.polytechnic.edu.sg/jpae**	NT64	NT65	NT66	NT67	NT68	NT70	NT71	NT72	NT73	NT74	NT75	NT76	NT77	NT79	NT80	NT81	NT82	NT88
Aeronautical Engineering [1]	✓			✓	✓				✓		✓	✓						✓
Aerospace Electronics [1]																		✓
Applied Chemistry																		
Architecture		✓	✓															
Bioengineering	✓			✓	✓				✓		✓	✓						✓
Chemical Engineering																		
Civil Engineering with Business		✓																
Computer Engineering										✓				✓	✓			✓
Electrical & Electronic Engineering [2]										✓	✓	✓		✓	✓			✓
Energy Systems & Management [2]											✓							✓
Engineering Systems [2]	✓			✓	✓						✓							✓
Engineering with Business																		✓
Experience & Product Design			✓			✓	✓	✓									✓	
Facilities Management									✓									
Food Science & Technology																		
Games Design and Development						✓	✓	✓							✓			
Infocomm Security Management										✓					✓			
Information Technology										✓					✓			
Integrated Events & Project Management																✓		
Interior Design		✓	✓			✓	✓	✓										
Landscape Architecture		✓	✓															
Marine Engineering [3]																		
Maritime Business																		
Mechanical Engineering	✓			✓	✓				✓		✓	✓						✓
Mechatronics and Robotics	✓			✓	✓				✓		✓	✓						✓
Nutrition, Health & Wellness																		
Optometry [4]													✓					
Perfumery and Cosmetic Science																		
Visual Communication and Media Design						✓	✓	✓							✓			

Full-Time Diploma Courses to be applied through Direct Admissions Exercise (DAE) in Jan 2018 at **http://www.sp.edu.sg/dae**	NT64	NT65	NT66	NT67	NT68	NT70	NT71	NT72	NT73	NT74	NT75	NT76	NT77	NT79	NT80	NT81	NT82	NT88
Digital Animation [5]		✓	✓			✓	✓	✓										
Nautical Studies [6]						✓	✓	✓	✓	✓	✓	✓		✓	✓	✓		✓
Visual Effects & Motion Graphics [5]		✓	✓			✓	✓	✓										

✓ Nitec Qualification holder with GPA of 3.5 and above is eligible to apply for this course.

TABLE 4: ENTRY REQUIREMENTS FOR FULL-TIME DIPLOMA COURSES (NITEC HOLDERS WITH GPA 3.5 AND ABOVE) - 2018/2019 SESSION *(CONTINUED)*

Note:

A) From 2003, ITE graduates can include their CCA points in their GPA to gain admission.

B) For those under the ITE non-modular system, distinctions in both practical and theory are required.

[1] It should be noted that applicants particularly those who wish to pursue a career as a Licensed Aircraft Engineer (LAE) who have severe colour vision deficiency, uncontrolled epilepsy and hearing deficiency may encounter difficulties meeting the course requirements and expectations. Interested applicants with mild deficiencies in these areas are advised to contact SP for consultation.

[2] It should be noted that applicants, particularly those who wish to pursue a career in electrical power engineering or as a Licensed Electrical Worker (LEW), with colour vision deficiency may encounter difficulties meeting the course requirements and expectations, as normal colour vision is required by the Energy Market Authority (EMA) of Singapore. Those with mild colour deficiency are required to undergo an in-house test. Interested applicants with this condition are highly encouraged to contact SP for consultation.

[3] All candidates must pass the colour vision test as per The International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW).

[4] Applicants with severe vision impairment may encounter difficulties meeting the course requirements and expectations. Please refer to the Ministry of Health (MOH) website on "Fitness to Practice" for registered Optometrists. Interested applicants with this condition are highly encouraged to contact SP for consultation.

[5] Shortlisted candidates must attend and pass an aptitude test cum interview with portfolio review.

[6] Applicants must ensure that they have good eyesight (i.e. visual acuity unaided of 6/60 in both eyes and with visual aids of 6/6 in the better eye and at least 6/9 in the other eye). Applicants must also pass the colour vision test as per The International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW). Any offer of admission will be conditional upon applicants showing proof of having passed the Maritime and Port Authority of Singapore (MPA) Sight Test which is conducted at the SP Optometry Centre or by General Practitioners. All applicants must be sponsored by a Singapore shipping company. Shortlisted candidates will be required to attend an interview conducted by the Singapore Maritime Academy. International students are required to find a Singapore shipping company of their choice that is prepared to offer them an internship for Phase 2 of this course.

For information on the courses conducted by Singapore Polytechnic, please visit **http://www.sp.edu.sg.**

NT59	Aerospace Avionics	NT82	Fashion Apparel Production & Design
NT67	Aerospace Machining Technology	NT79	Info-Communications Technology (Cloud Computing)
NT53	Aerospace Technology	NT40	Info-Communications Technology / Info-Communications Technology (Networking & System Administration)
NT28	Air-Conditioning & Refrigeration / Air-Conditioning & Refrigeration Mechanics / Air–Conditioning & Refrigeration Technology	NT70	Interactive Media Design
NT51	Aircraft Maintenance (Mechanical)	NT68	Laser & Tooling Technology / Semiconductor Tooling Technology
NT58	Applied Food Science	NT62	Machine Building Technology / Machine Technology
NT21	Architectural Drafting / Building Drafting (Architectural)	NT30	Maintenance Fitting / Mechanical Servicing / Mechanical Technology
NT81	Attractions Operations	NT49	Marine Electrical Technology
NT29	Automotive Mechanics (Construction Equipment) / Automotive Technology (Construction Equipment / Automotive Technology (Heavy Vehicles)	NT42	Marine Technology / Marine Mechanics
NT31	Automotive Mechanics (Light Vehicles) / Automotive Technology (Light Vehicles) / Diesel Engine Mechanics / Motor Vehicle Mechanics	NT43	Mechanical-Electrical Drafting
NT38	Building Servicing / Building Services Technology / Building Services Technology (Air-Conditioning & Refrigeration) / Building Services Technology (Mechanical & Electrical Services) / Facility Technology (Air-Conditioning & Refrigeration)	NT64	Medical Manufacturing Technology
NT39	Chemical Process Technology / Chemical Process Technology (Biologics) / Chemical Process Technology (Petrochemicals) / Chemical Process Technology (Pharmaceuticals) / Chemical Process Technology (Process Instrumentation)	NT74	Mobile Systems & Services / Info-Communications Technology (Mobile Networks & Applications)
NT23	Civil & Structural Drafting / Building Drafting (Civil & Structural)	NT41	Multimedia Technology
NT47	Communications Technology	NT77	Opticianry
NT52	Digital Animation	NT50	Port Equipment Technology
NT56	Digital Audio & Video Production	NT48	Precision Engineering (Aerospace)
NT54	Digital Media Design (Digital Video Effects)	NT37	Precision Engineering (Injection Mould) / Precision Engineering (Press Tool) / Precision Engineering (Tool & Mould) / Precision Tooling / Tool & Die - Making
NT44	Digital Media Design / Digital Media Design (Interactive Media)	NT32	Precision Machining / Precision Engineering (Machining)
NT26	Electrical Fitting & Installation / Electrical Installation & Servicing / Electrical Technology / Electrical Technology (Installation & Servicing)	NT46	Product Design
NT27	Electrical Power & Machines / Electrical Technology (Power & Control) / Electrical Technology (Power & Machines)	NT75	Rapid Transit Technology
NT60	Electrical Technology (Lighting & Sound)	NT57	Security Technology
NT25	Electro - Mechanical Servicing / Mechatronics / Mechatronics (Automation Technology) / Mechatronics (Equipment Assembly) / Mechatronics (Medical Technology)	NT76	Semiconductor Technology / Electronics (Microelectronics)
NT88	Electronics (Display Technology)	NT80	Social Media & Web Development
NT24	Electronics / Electronics Servicing / Electronics (Broadband Technology & Services) / Electronics (Computer & Networking) / Electronics Instrumentation / Electronics (Mobile Devices) / Electronics (Water Fabrication) / Electronics (Wireless LAN)	NT65	Space Design (Architecture)
NT61	Facility Technology (Landscaping Services)	NT66	Space Design (Interior & Exhibition)
NT63	Facility Technology (Mechanical & Electrical Services)	NT71	Visual Communication
NT73	Facility Technology (Vertical Transportation)	NT72	Visual Effects

TABLE 5: ENTRY REQUIREMENTS FOR FULL-TIME DIPLOMA COURSES (FULL-TIME PROGRAMME NCCS HOLDERS) – 2018/2019 SESSION

Course Applied for	Entry Requirement	Duration (Year)
Civil Engineering with Business	Full-Time Programme in National Certificate in Construction Supervision (NCCS) and the following GCE 'O' Level Subject Grades: English Grade 1 - 8 Mathematics Grade 1 - 6 Relevant Science Subject Grade 1 - 8	2
Facilities Management		3

TABLE 6A: ENTRY REQUIREMENTS FOR FULL-TIME DIPLOMA COURSES (INTERNATIONAL QUALIFICATION HOLDERS) – 2018/2019 SESSION

Country	Minimum Qualifications
Returning Singapore Citizens (for qualifications not listed below)	Must have completed at least Year 10. Application will be assessed on a case by case basis. Qualification attained must be equivalent to the GCE 'O' Level Certificate
Home Schooled Students (for qualifications not listed below)	Application will be assessed on a case by case basis. Qualification attained must be equivalent to the GCE 'O' Level Certificate
Hong Kong	Hong Kong Diploma of Secondary Education (HKDSE)
India	Secondary School Certificate (Year 10) or Senior School Certificate (Year 12)
Indonesia	SMA Ujian Akhir Nasional (UAN) / STTB SMA or SMA / SMU Ebtanas
Malaysia	Sijil Pelajaran Malaysia (SPM) - See Table 1A and 1B Sijil Tinggi Persekolahan Malaysia (STPM) – See Table 2 Unified Examination Certificate (UEC) See Table 1A, 1B and 2 Unified Examination Certificate – Vocational (UECV) – See Table 6B
Myanmar	Basic Education High School (BEHS)
New Zealand	National Certificate in Educational Achievement – Level 2
People's Republic of China	Year 2017 Gaokao [also known as National College Entrance Examination (NCEE)]
Sri Lanka	Sri Lankan General Certificate of Education (O.L.) Examination
Thailand	Maw 6
United States	Year 12 High School Diploma
Vietnam	Year 12 High School Graduation Certificate of National Examination
Other Countries	GCSE / IGCSE / GCE (non Singapore-Cambridge) and / or other qualifications will be assessed based on its equivalence to the GCE 'O' level examinations

Shortlisted candidates will most likely have to sit for entrance tests.

1 For enquiries, please email to **contactus@sp.edu.sg.**

2 The polytechnic reserves the right to amend the information provided without prior notice. Those residing overseas offered entrance tests in Singapore have to make their own arrangements if they wish to sit for the test.

3 Meeting the minimum entry requirements is not a guarantee that a candidate will be shortlisted or selected. Shortlisting / Selection will depend on competition for limited course vacancies in the year of application.

4 Those offering GCE / GCSE / IGCSE qualifications will be assessed fully on this qualification and no entrance tests will apply. It cannot be used in combination with any other qualification for entrance tests subject exemption.

5 SATI (minimum score: Critical Reading / Verbal 560, Math 600) and SATII (Physics / Chemistry minimum score: 600) can be offered in support of application. The applicant must request College Board to send a copy directly to Singapore Polytechnic (Singapore Polytechnic's Code: 5648).

6 An applicant is deemed to have attained a sufficient level of Proficiency in the English Language. If he / she attains a TOEFL score of 550 (paper based), 213 (computer based) or 79 (internet based) or IELTS (International English language Testing System) – overall minimum 6.0; for China qualifications 6.0 is also required for reading and speaking components, or passes our English Language entrance test. Our English entrance test is only offered to selected / shortlisted applicants. Please also note that TOEFL scores must be received directly from ETS (Educational Testing Service) otherwise it will not be considered. (The code for Singapore Polytechnic: 8510).

7 Interested applicants may complete the electronic application form (E-Form) and submit the required supporting documents. Should the qualifications be printed in a language other than English, please provide an English translation.

TABLE 6B: ENTRY REQUIREMENTS FOR FULL-TIME DIPLOMA COURSES (UEC-VOCATIONAL HOLDERS) – 2018/2019 SESSION

Courses	Subjects	Acceptable Grades
Civil Engineering with Business	a) English Language (Industrial English is not accepted)	1 - 6
Electrical & Electronic Engineering [1]	b) Mathematics	1 - 6
Marine Engineering [2]	c) **One** of the following relevant subjects: • Electrical Engineering a. Basic Circuit Theory b. Fundamentals of Electrical Engineering	1 - 6 in both subjects
Mechanical Engineering		
Mechatronics and Robotics	• Electronics a. Digital Logic b. Principle Electronic	1 - 6 in both subjects
	• Mechanical Engineering (those offering this will only be eligible for Civil Engineering with Business, Marine Engineering and Mechanical Engineering courses).	1 - 6

[1] It should be noted that applicants, particularly those who wish to pursue a career in electrical power engineering or as a Licensed Electrical Worker (LEW), with colour vision deficiency may encounter difficulties meeting the course requirements and expectation, as normal colour vision is required by the Energy Market Authority (EMA) of Singapore. Those with mild colour deficiency are required to undergo an in-house test. Interested applicants with this condition are highly encouraged to contact SP for more information.

[2] All candidates must pass the colour vision test as per The International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW).

TABLE 7: ENTRY REQUIREMENTS FOR FULL-TIME DIPLOMA COURSES (POLYTECHNIC FOUNDATION PROGRAMME) - 2018/2019 SESSION

- Raw ELMAB3 aggregate score of 11 points or better at the GCE 'N' Level.
- ELMAB3 = English Language + Mathematics + Best 3 subjects (which also include one of the relevant subjects based on either the Group 1 or Group 2 courses).

Group 1 Diploma Courses	Subjects	Minimum Grade
Aeronautical Engineering [1]	English Language Syllabus A	3
Aerospace Electronics [1]	Mathematics (Syllabus A / Additional)	3
Applied Chemistry	One of the following relevant subjects:	
Applied Drama and Psychology	• Design and Technology	
Architecture	• Food and Nutrition	
Bioengineering	• Science (Chemistry, Biology)	3
Biomedical Science	• Science (Physics, Biology)	
Biotechnology	• Science (Physics, Chemistry)	
Business Information Technology	Any two other subjects (Excluding CCA)	3
Chemical Engineering		
Civil Engineering with Business		
Common Engineering Programme [5]		
Computer Engineering		
Creative Writing for Television and New Media		
Digital Animation		
Electrical & Electronic Engineering [2]		
Energy Systems and Management [2]		
Engineering Systems [2]		
Engineering with Business		
Experience and Product Design		
Facilities Management		
Financial Informatics		
Food Science & Technology		
Games Design and Development		
Infocomm Security Management		
Information Technology		
Integrated Events & Project Management		
Interior Design		
Landscape Architecture		
Marine Engineering [4]		
Maritime Business		
Mechanical Engineering		
Mechatronics and Robotics		
Media and Communication		
Nutrition, Health & Wellness		
Optometry [3]		
Perfumery and Cosmetic Science		
Visual Communication and Media Design		
Visual Effects and Motion Graphics		

[1] It should be noted that applicants particularly those who wish to pursue a career as a Licensed Aircraft Engineer (LAE) who have severe colour vision deficiency, uncontrolled epilepsy and hearing deficiency may encounter difficulties meeting the course requirements and expectations. Interested applicants with mild deficiencies in these areas are advised to contact SP for consultation.

[2] It should be noted that applicants, particularly those who wish to pursue a career in Electrical power engineering or as a Licensed Electrical Worker (LEW), with colour vision deficiency may encounter difficulties meeting the course requirements and expectations, as normal colour vision is required by the Energy Market Authority (EMA) of Singapore. Those with mild colour deficiency are required to undergo an in-house test. Interested applicants with this condition are highly encouraged to contact SP for more information.

[3] Applicants with severe vision impairment may encounter difficulties meeting the course requirements and expectations. Please refer to the Ministry of Health (MOH) website on "Fitness to Practice" for registered Optometrists. Interested applicants with this condition are highly encouraged to contact SP for more information.

[4] All applicants must pass the colour vision test as per The International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW).

[5] At the end of the first semester, students will opt for one of the following courses: (must satisfy the respective course entry requirements):

Aeronautical Engineering [1]	Electrical & Electronic Engineering [2]
Aerospace Electronics [1]	Energy Systems and Management [2]
Bioengineering	Mechanical Engineering
Computer Engineering	Mechatronics and Robotics

Group 2 Diploma Courses	Subjects	Minimum Grade
Accountancy	English Language Syllabus A	2
Banking and Finance	Mathematics (Syllabus A / Additional)	3
Business Administration	One of the following relevant subjects:	
Human Resource Management with Psychology	• Art	
Tourism and Resort Management	• Combined Humanities	
	• Geography	3
	• History	
	• Literature in English	
	• Principles of Accounts	
	Any two other subjects (Excluding CCA)	3

EXAMINATION

CREDIT ACCUMULATION MODULAR SYSTEM

Under the credit accumulation modular system, students will take a selected number of modules and accumulate credit units for those modules they have passed. Modules are assessed immediately upon completion of the required academic work at the end of a semester. There will be two semesters in an academic year. Students who fail in the semestral examination need only to repeat the failed modules in the next semester or year. They will not have to repeat all the modules belonging to the previous semester.

CONDITIONS FOR AWARD OF DIPLOMA

A student shall pass all core modules and option modules of the course and, where applicable, sufficient elective modules to accumulate the stipulated number of credit units, before he is considered for the award of the diploma.

DURATION ALLOWED TO COMPLETE COURSE

The duration allowed for a student to complete his course of study is as follows:

a) Two years for a one-year course of study;

b) Four years for a two-year course of study;

c) Six years for a three-year course of study;

Note: A student who is admitted directly into the second year of a three-year course will be deemed to be doing a two-year course of study. This applies to all students who do not start from the first year of the course.

CONDITIONS FOR PROMOTION IN A COURSE

A student must pass all the core modules and option modules in a stage before he is promoted to the next stage of the course. The overall assessment of a module is based on any one or more of the following:

a) semestral examination

b) 100% in-course assessment

c) continual assessment

To obtain a clear pass in a module, a student must score 50% or more in the overall assessment of that module.

CONDITIONS FOR REPEATING MODULES

i) Students who fail any core module or option module of a stage shall be retained in that stage. They need not, however, repeat the modules they have passed. If a student fails an elective module, he will be allowed to substitute that failed module with another appropriate elective module.

ii) While repeating a stage, students may be allowed to take new modules of the next stage, together with the repeat modules. This is subject to the approval of the respective Academic Director and on condition that the total credit units do not exceed the prescribed number for that stage, and if such classes can be scheduled.

iii) Notwithstanding (ii) above, a student who has to repeat only one module may, upon the approval by the Academic Director be allowed to take that repeat module together with all the new modules in the next stage, provided such classes can be scheduled. This is a privilege granted to the student and not a right, based solely on the assessment of the student's ability to cope with the additional module.

CONDITIONS FOR REMOVAL

A student shall be removed from the course if:

a) he is unable to complete his course of study within the period of the duration allowed for that course.

b) he repeats any of the core modules, option or elective modules and fails.

c) he obtains a semestral average below 35% at one sitting for that stage.

d) he is absent from the semestral examination without a valid reason.

ABSENCE FROM EXAMINATIONS

a) A student who is absent without a valid reason from the semestral examination for a module shall be considered to have sat and failed the module.

b) If a student has a valid reason to miss taking the semestral examination, he may apply for leave of absence (LOA) from the semestral examination, using the online LOA application form via the Student Portal.

c) Where the reason for absence from the semestral examination is known beforehand, the student must submit his application for leave of absence from the semestral examination before the day of the examination. For all other reasons of absence which cannot be known beforehand, such application for leave of absence must be submitted within two working days from the day of absence.

d) Where a student is granted leave of absence from the semestral examination, the module shall be removed from the list of modules registered by him for that semester and he shall not be considered to have made one attempt in the examination for that module. The student must attend all classes and sit for all assessments in the module in a subsequent semester in which that module is offered, subject to the maximum number of modules allowed for that stage of study and the constraints of the class timetable.

e) Notwithstanding Para (d) above, a student who is granted leave of absence from the semester examination may apply to the Director of his school to be exempted from attending classes for the subsequent sitting and/or to be allowed to carry forward his past in course assessed component marks. The application will be considered on a case by-case basis. The application procedure may be obtained from the school which the student belongs to.

f) A student shall only be granted one deferment for each of the modules that he is taking.

g) A student who would be given only a Pass/Fail grade for the module would not be allowed to apply for leave of absence from exams/assessment for that module in that semester.

APPEALS FROM STUDENTS

Students may make appeals in respect to their semestral examination results by submitting an appeal form obtainable from the Student Service Centre. All appeals should be submitted within four working days following the release of the examination results.

FEES

TUITION FEES PAYABLE (FOR FIRST ACADEMIC YEAR)
a) Full-time Diploma
(i) All Diploma Courses *Refer to Table 1 in this section*
(ii) Diploma-Plus Programme *Refer to detailed fees breakdown by course*
b) Polytechnic Foundation Programme
Refer to Table 2 in this section
c) Early Admissions Exercise
Refer to Table 1 in this section
d) Part-time Diploma
Refer to Tables 3, 4, 5 & 6 in this section

A) FULL-TIME DIPLOMA

The fees per academic year are payable in two instalments unless otherwise advised. The first instalment is due in the first semester and the second, in the second semester. All students will be notified by the Finance Department of the date of payment of each instalment.

New students who are offered a place in 2018/2019 academic year will receive an enrolment package. All new students are required to pay their first semester fee during enrolment. Please refer to the Fee Advice for the actual amount payable and the payment options available enclosed in the enrolment package.

TUITION GRANT FOR FULL-TIME STUDENTS

a) A student's full-time education is subsidised by the Government of Singapore. However, to help students pay part of the training cost, the Singapore Government, through the Ministry of Education, provides tuition grants to all full-time students.

The fees below (inclusive of GST) are based on Academic Year 2018/2019.

SINGAPOREAN STUDENT	
Subsidised Fees	$2,996.00
Non Subsidised Fees	$21,614.00

SINGAPORE PERMANENT RESIDENT STUDENT	
Subsidised Fees	$5,992.00
Non Subsidised Fees	$21,614.00

INTERNATIONAL STUDENT	
Subsidised Fees	$10,000.00
Non Subsidised Fees	$21,609.50

b) Non-Singaporeans and Permanent Residents of Singapore who want to receive the tuition grant will have to sign a deed with the Government. Under the terms of the Tuition Grant (TG) Deed, you will be bonded to work for a Singapore company for 3 years upon graduation.

Two sureties are required for the execution of the TG Deed. They can be of any nationality, above 21 years and below 65 years of age and must not be bankrupts. Students may refer to inserts in the enrolment package for details on applications and conditions.

RESERVED PLACES FOR FULL-TIME NATIONAL SERVICEMEN

The tuition grant scheme will also apply to National Servicemen granted places on a reserved basis in previous years. Their tuition grants will be suitably adjusted such that their direct payment will be the same as that of other students who entered the polytechnic at that time.

FEE LIABILITY

Students are liable to pay fees if their official withdrawal is after commencement of semester. All components of Other Fees are subjected to changes.

CHANGE IN CITIZENSHIP STATUS

For international students who obtain Singapore Citizenship (SC) or Permanent Resident (SPR) status before the commencement of each semester, their fees will be adjusted with effect from that semester. However, for those who obtain their SC or SPR status after the commencement of a semester, they will pay the fees for Singaporeans/Permanent Residents with effect from the next semester. There shall be no refund of the difference of fees already paid.

TABLE 1: SUMMARY OF FEES FOR FULL TIME DIPLOMA

The fees below are based on Academic Year 2018/2019.

Table 1a: Annual Course Fees (inclusive of GST) for student who accepts Tuition Grant

ANNUAL COURSE FEES	SINGAPOREAN	SINGAPOREAN PR	INTERNATIONAL
Subsidised Fee: Other Fees (Note 1):	$2,996.00 $90.55	$5,992.00 $122.65	$10,000.00 $156.66
MOE Subsidy for GST on Tuition Fee and/or Examination Fee	($196.00)	($394.10)	NA
Total	$2,890.55	$5,720.55	$10,156.65
Amount to pay before Enrolment for Semester 1 (Note 2) Amount to pay in Semester 2 (Note 3)	$1,490.55 $1,400.00	$2,920.55 $2,800.00	$5,156.65 $5,000.00

Table 1b: Annual Course Fees (inclusive of GST) for student who rejects/not eligible for Tuition Grant

ANNUAL COURSE FEES	SINGAPOREAN	SINGAPOREAN PR	INTERNATIONAL
Non Subsidised Fee: Other Fees (Note 1):	$21,614.00 $90.55	$21,614.00 $122.65	$21,609.50 $156.65
Total	$21,704.55	$21,736.65	$21,766.15
Amount to pay before Enrolment for Semester 1 (Note 2) Amount to pay in Semester 2 (Note 3)	$10,897.55 $10,807.00	$10,929.65 $10,807.00	$10,961.40 $10,804.75

Note 1: Other Fees for all students

	SINGAPOREAN	SINGAPOREAN PR	INTERNATIONAL
Total Other Fees (For student who rejects Tuition Grant)	$90.55	$122.65	$156.65
MOE Subsidy for GST on Examination Fee	NA	($2.10)	NA
Total Other Fees (For student who accepts Tuition Grant)	$90.55	$120.55	$156.65

Note 2: Semester 1 fees include Tuition Fee and Other Fees
Note 3: Semester 2 fees include Tuition Fee only

FINANCIAL SCHEMES FOR FULL-TIME DIPLOMA COURSES

Student who accepts Tuition Grant is eligible to apply for the Financial Schemes to pay for your course fees. You may apply for one or more of the financial schemes depending on your financial needs.

Upon approval from the respective authorities, the approved amount will be used to pay for your course fees in the following sequence:

1st — Mendaki Tertiary Tuition Fee Subsidy (Mendaki TTFS)
2nd — SkillsFuture Credit (SFC)
3rd — Post Secondary Education Account (PSEA)
4th — CPF Approved Education Scheme (CPF-AES)
5th — Tuition Fee Loan (TFL)

1) Mendaki Tertiary Tuition Fee Subsidy (Mendaki TTFS)

The approved amount will be used to pay for your Tuition Fee only. Other fees have to be paid by other mode of payment e.g.

- E-Payment
- AXS
- Selected OCBC branches

ELIGIBILITY

- Singaporean Malay
- Singapore Permanent Residents Malay
- Full-time diploma student
- Household Per Capita Income (PCI) less than $1,500

PER CAPITA INCOME (PCI)	SUBSIDY
$1,000 and below	100% of Tuition Fee
$1,001 - $1,200	75% of Tuition Fee
$1,201 - $1,500	50% of Tuition Fee

- For details of eligibility criteria, please log on to **http://www.mendaki.org.sg/mendaki/programmes/educational-assistance/tertiary-tuition-fee-subsidy-ttfs**

APPLICATION

- Log on to **http://tfas.mendaki.org.sg** to make an application. Only online applications will be accepted by Mendaki.
- Print a copy of the acknowledgement page and submit together with your enrolment documents to SP Finance Department.
- Once approved, Mendaki will pay the approved amount directly to SP.

CONTACT

For further enquiries, you can:

- call Yayasan Mendaki at Tel: 6551 2840
- email to **ttfs@mendaki.org.sg**
- visit website at **http://www.mendaki.org.sg**

2) SkillsFuture Credit (SFC)

SFC is applicable to work-skills related education and training courses to empower Singaporeans in their learning and development, to deepen and broaden their skills. Government will provide periodic top-ups, so you may accumulate your credit which will not expire. SFC can be used on selected courses offered by polytechnics. Please find the full list of available courses at **www.skillsfuture.sg/credit**

ELIGIBILITY

- Singaporean
- Full-time diploma student
- Aged 25 and above

APPLICATION

- Please log on to **http://www.skillsfuture.sg/credit** by using your own SingPass through SFC portal. If you do not have a SingPass account, you may apply at **https://www.singpass.gov.sg/**
- You can view a summary of your SkillsFuture credit that is available.
- For more details on claim submission, you may visit **http://www.skillsfuture.sg/docs/SFC_UserGuide.pdf**
- Print a copy of acknowledgement page, with Claim ID, Claim Amount and Date Submitted, after your submission.

CONTACT

For further enquiries you can:

- call SkillsFuture hotline at Tel: 6785 5785
- visit website at **http://www.skillsfuture.sg/credit**

3) Post Secondary Education Account (PSEA)

The PSEA scheme is administered by MOE. If a Singaporean has an Edusave account, the balance amount will be transferred to PSEA when he is 16 years old or when he leaves Secondary School/Junior College/Centralised Institute or Vocational Training Center, whichever occurs later.

Your PSEA money can be used to pay for your Course Fees (includes Tuition Fee and Other Fees).

ELIGIBILITY

- Singaporean
- Full-time diploma student

APPLICATION

- Complete the 'Standing Order for Use of Post Secondary Education Account' form.
- Submit the completed form to SP Finance Department.
- SP will forward your application to MOE (PSEA) for their approval.
- Once approved, MOE (PSEA) will pay the approved amount directly to SP.
- The closing date for application is 30 April 2018.

CONTACT

To find out your PSEA balance, you can:

- call MOE Customer Service at Tel: 6260-0777
- email to **contact@moe.gov.sg**
- visit website at **https://www.moe.gov.sg**

To print the Standing Order Form, go to PSEA website at **http://www.moe.gov.sg/initiatives/post-secondary-education-account/eligibility-and-usage.**

4) CPF Approved Education Scheme (CPF-AES)

The CPF-AES is a loan scheme which enables members to use CPF savings from their Ordinary Account to pay for their children's, siblings' or their own Tuition Fee. Members are required to pay an administrative fee of $10.70 to the CPF Board for each deduction from a member's account.

Other fees have to be paid by other mode of payment e.g.

- E-Payment
- AXS
- Selected OCBC branches

The student has to repay the amount withdrawn plus interest, in cash subsequently into the payer's Ordinary Account. Repayment commences one year after the student graduates or leaves the educational institution.

ELIGIBILITY

- All nationalities
- Full-time diploma student

APPLICATION

- You and the CPF member (e.g. parents or siblings) must have SingPass and email accounts. If you do not have a SingPass account, you may apply at **https://www.singpass.gov.sg**
- Submit online application using your own SingPass through CPF Board's website **https://www.cpf.gov.sg** before enrolment:
  - An email with an URL will be sent within 2 days to the CPF member's email address provided in your application. You will not receive the email if you are applying to use your own CPF monies.
  - The CPF member must log in using his own SingPass within 14 days from the date of the application, to agree to the use of his CPF monies. Otherwise, your application will be rejected.
  - You must login to **https://www.cpf.gov. sg >> 'My CPF Online Services' >> 'My Activities'** to print a copy of the acknowledgement page with status "Approved in Principle" and submit together with your enrolment documents to SP Finance Department.
- Once approved, CPF Board will pay the approved amount directly to SP.
- The closing date for CPF-AES application is on 30 April 2018.

CONTACT

For further enquiries on e-application for use of CPF monies, you can:

- call CPF Call Centre at Tel: 1800-227-1188 (Fax: 6229-3243)
- email to education@cpf.gov.sg
- visit website at **https://www.cpf.gov.sg/Members/schemes/schemes/other-matters/CPF-education-scheme**

5) Tuition Fee Loan (DBS-TFL)

DBS-TFL is a government-funded education loan which is administered by DBS Bank. You can apply up to 75% of the Tuition Fee only. You need to pay for the remaining 25% of the Tuition Fee and Other Fees by other mode of payment e.g.

- E-Payment
- AXS
- Selected OCBC branches

The loan is interest-free during course of study. You have to repay the loan plus interest, charged at average prime rate of DBS, OCBC and UOB, after graduation.

ELIGIBILITY

- All nationalities
- Full-time diploma student

APPLICATION

- Complete the application form.
- Visit any DBS Bank branch (not POSB bank) personally with your guarantor to submit the following documents and sign the loan agreement:
  - Completed application form
  - You and your guarantor's identity cards/ passports
- Obtain a photocopy of the bank-endorsed loan agreement and submit together with your enrolment documents to SP Finance Department. Retain a copy of the bank-endorsed loan agreement for your own record.
- Once approved, DBS Bank will pay the approved amount directly to SP.
- The closing date for application is on 30 April 2018.

CONTACT

For further enquiries on application for TFL, you can:

- call DBS customer hotline at: 6333-0033
- email to customerservice@dbs.com
- visit website at **https://www.dbs.com.sg/personal/loans/education-loans/tuition-fee-loan.**

DIPLOMA-PLUS PROGRAMMES

To give you an edge in your aspirations upon graduation, SP offers you a range of certificate programmes, whilst you are pursuing your diploma course. These certificate programmes aim to deepen your learning, stretch your capabilities and nurture your potential to its fullest. Depending on your strength and purpose, these specially tailored programmes will either better prepare you for university studies or equip you with valuable knowledge and workplace skills.

OBJECTIVES OF PROGRAMME

Embedded in these programmes of various disciplines are numerous learning opportunities for students.

The courses in different disciplines allow students to:

- deepen foundation in core subjects and prepare for higher studies;
- study subjects outside main area of discipline and broaden learning; develop specialized skills and knowledge.
- The fees are subjected to changes for academic year 2018/2019. All fees are inclusive of 7% GST.

DIPLOMA-PLUS PROGRAMMES

SCHOOL OF ARCHITECTURE & THE BUILT ENVIRONMENT

DIPLOMA-PLUS CERTIFICATE IN SUSTAINABILITY (PCS)		
MODULE CODE	MODULE NAME	COURSE FEE ($)
BE0101	Introduction to Sustainability & Green Issues	107.00
BE0102	Environmental Sustainability	160.50
BE0103	Social & Economic Sustainability	107.00

DIPLOMA-PLUS CERTIFICATE IN HUMANITARIAN AFFAIRS (PCHA)		
MODULE CODE	MODULE NAME	COURSE FEE ($)
BE0201	Introduction to Humanitarian Assistance	107.00
BE0202	International Relief & Development	160.50
BE0203	Stakeholder Relations & Fundraising	107.00

DIPLOMA-PLUS CERTIFICATE IN QUANTITY SURVEYING (PCQS)		
MODULE CODE	MODULE NAME	COURSE FEE ($)
BE0301	Measurement I	107.00
BE0302	Measurement II	107.00
BE0303	Contract Administration & Costing	107.00

SP BUSINESS SCHOOL

DIPLOMA-PLUS CERTIFICATE IN BUSINESS (PCB)		
MODULE CODE	MODULE NAME	COURSE FEE ($)
BA0372	Fundamentals of Economics	107.00
BA4113	Marketing Fundamentals	107.00
BA6001	Introduction to Accounting	107.00
BA0227	Essentials of Finance	107.00

DIPLOMA-PLUS CERTIFICATE IN APPLIED PSYCHOLOGY (PCAP)		
MODULE CODE	MODULE NAME	COURSE FEE ($)
BA0701	Introduction to Psychology	107.00
BA0702	Applied Psychology in Effective Work Relationship Skills	107.00
BA0703	Work Group Dynamics & Social Psychology	107.00

DIPLOMA-PLUS CERTIFICATE IN ACCOUNTING (PCA)		
MODULE CODE	MODULE NAME	COURSE FEE ($)
BA0731	Audit & Assurance	107.00
BA0732	Principles of Taxation	107.00
BA0733	Costing & Company Law	107.00

SCHOOL OF CHEMICAL & LIFE SCIENCES

DIPLOMA-PLUS CERTIFICATE IN PHLEBOTOMY (PCIP)		
MODULE CODE	MODULE NAME	COURSE FEE ($)
CP2073	Anatomy & Physiology For Phlebotomists	240.75
CP2074	Healthcare Workplace Practices	240.75
CP2075	Phlebotomy & Non-Blood Specimens Collection	374.50
CP2076	Clinical Practicum	-

DIPLOMA-PLUS CERTIFICATE IN HEALTHCARE INNOVATION (PCHI)		
MODULE CODE	MODULE NAME	COURSE FEE ($)
CP7221	Introduction to Healthcare Innovation & Design Thinking	107.00
CP722Y/Z	Healthcare Innovation Project	107.00
CP7223	Entrepreneurship & Presentation Skills	107.00

SCHOOL OF COMMUNICATION, ARTS & SOCIAL SCIENCES

DIPLOMA-PLUS CERTIFICATE IN DIGITAL FILM (PCDF)		
MODULE CODE	MODULE NAME	COURSE FEE ($)
SC7251	History of Film	107.00
SC7252	Scriptwriting for Film	107.00
SC7253	Directing for Film	160.50
SC7254	Project	160.50

SP DESIGN SCHOOL

DIPLOMA-PLUS CERTIFICATE IN DESIGN THINKING (PCDT)		
MODULE CODE	MODULE NAME	COURSE FEE ($)
SD5000	Preparatory Design Studio	107.00
SD5001	Exploratory Design Thinking Studio I	107.00
SD5002	Exploratory Design Thinking Studio II	107.00
SD5003	Exploratory Design Thinking Studio III	107.00

SINGAPORE MARITIME ACADEMY

DIPLOMA-PLUS CERTIFICATE IN MARITIME LAW AND DISPUTE RESOLUTION (PCMLD)		
MODULE CODE	MODULE NAME	COURSE FEE ($)
MA8001	Sources of Law & Legal Proceedings	107.00
MA8002	Admiralty Law & Practice	107.00
MA8003	Maritime Dispute Resolution	107.00

SCHOOL OF DIGITAL MEDIA & INFOCOMM TECHNOLOGY

DIPLOMA-PLUS CERTIFICATE IN DIGITAL MEDIA CREATION (PCDMC)		
MODULE CODE	MODULE NAME	COURSE FEE ($)
ST5061	Graphics Design using Imaging Tools 1	107.00
ST5062	Graphics Design using Imaging Tools 2	107.00
ST5063	3D Content Development	107.00
ST5059	Digital Video	107.00

SCHOOL OF MECHANICAL & AERONAUTICAL ENGINEERING

DIPLOMA-PLUS CERTIFICATE IN AVIATION MANAGEMENT (PCAM)		
MODULE CODE	MODULE NAME	COURSE FEE ($)
MM6103	The Airline Industry	107.00
MM6104	Airport Terminal Operation & Management	107.00
MM6105	Airport Ramp Operation & Management	107.00

SCHOOL OF ELECTRICAL & ELECTRONIC ENGINEERING

DIPLOMA-PLUS CERTIFICATE IN POWER ENGINEERING PRACTICES (PCPEP)		
MODULE CODE	MODULE NAME	COURSE FEE ($)
ET0258	Planning & Design of Power Distributing System	160.50
ET0256	Commissioning & Testing of Power Distribution System	160.50
ET0257	Safe Operation & Maintenance of Power Distribution System Equipment	160.50

B) POLYTECHNIC FOUNDATION PROGRAMME

For a Normal Academic [N(A)] student looking at entering a polytechnic, instead of heading to Secondary 5, the PFP enables you to embark on a one-year practice-oriented curriculum taught by polytechnic lecturers. This programme, offered to the top 10% of the Secondary 4 N(A) cohort, will better prepare you for entry into the polytechnic diploma course that you're interested in.

Your successful admission into this programme gives you provisional placing in the diploma course of your choice, subject to you passing all modules in the PFP.

TABLE 2: SUMMARY OF FEES FOR POLYTECHNIC FOUNDATION PROGRAMME

The fees below are based on Academic Year 2018/2019.

ANNUAL COURSE FEES	SINGAPOREAN	SINGAPOREAN PR	INTERNATIONAL
Tuition Fee : Other Fees :	$363.80 $90.55	$2,407.50 $122.65	$9,600.00 $156.65
MOE Subsidy for GST on Tuition Fee	($23.80)	($157.50)	NA
Total	$430.55	$2,372.65	$9,756.65
Amount to pay before enrolment for Semester 1 (Note 4) Amount to pay in Semester 2 (Note 5)	$260.55 $170.00	$1,247.65 $1,125.00	$4,956.65 $4,800.00

Note 4: Semester 1 fees include Tuition Fee and Other Fees
Note 5: Semester 2 fees include Tuition Fee only

FINANCIAL ASSISTANCE SCHEMES FOR POLYTECHNIC FOUNDATION PROGRAMME

POST SECONDARY EDUCATION ACCOUNT (PSEA)

The PSEA scheme is administered by MOE. If a Singaporean has an Edusave account, the balance amount will be transferred to PSEA when he is 16 years old or when he leaves Secondary School/Junior College/Centralised Institute or Vocational Training Center, whichever occurs later.

Your PSEA money can be used to pay for your Course Fees (includes Tuition Fee and Other Fees).

ELIGIBILITY

- Singaporean
- Polytechnic Foundation Programme student

APPLICATION

- Complete the 'Standing Order for Use of Post Secondary Education Account' form.
- Submit the completed form to SP Finance Department.
- SP will forward your application to MOE (PSEA) for their approval.
- Once approved, MOE (PSEA) will pay the approved amount directly to SP.
- The closing date for application is 30 April 2018.

CONTACT

To find out your PSEA balance, you can:

- call MOE Customer Service at Tel: 6260-0777
- email to **contact@moe.gov.sg**
- visit website at **https://www.moe.gov.sg**

To print the Standing Order Form, go to PSEA website at **http://www.moe.gov.sg/initiatives/post-secondary-education-account/eligibility-and-usage.**

C) EARLY ADMISSIONS EXERCISE (EAE)

EAE is an admissions exercise that allows students to apply and receive conditional offers for admission to polytechnic based on their aptitudes and interests before taking their 'O' Level examinations **(http://www.sp.edu.sg/eae/)**.

OTHER CHARGES

CHARGES	AMOUNT (GST INCLUSIVE)
a) Registration Fee for SMA DNS/Class 3 Correspondence course	$7.00
• Fee for DNS/ Class 3 Correspondence Course (Singaporean)	$700.00
• Fee for DNS/ Class 3 Correspondence Course (Singapore PR)	$931.00
• Fee for DNS/ Class 3 Correspondence Course (Foreigner)	$1,400.00
b) Entrance Test Fee per subject (when an application to sit for Entrance Test is approved)	$10.70
c) Replacement Fee for Documents :	
• Library Membership Card (Graduate, Personal & Corporate membership)	$2.15
• Duplicate copy of certificate issue through Singapore Maritime Academy (Such duplicate copies will be supplied when a signed statement is given to the department setting out the circumstances for the loss of the original certificate)	$21.40
• Duplicate copy of Statement of Fee Receipt	$5.35
• Student Admission Card	$10.70

INTERBANK GIRO

a) Payment of subsequent semesters' course fees

All students are to participate in the Interbank GIRO Scheme which is an easy and convenient way to pay their subsequent semesters' fees. For students without a valid Bank account, the alternate payment modes are:

- E-payment
- AXS
- Selected OCBC branches
- Student Service Counter
- Finance Counter

b) Refund/Payment due to you

The same GIRO account will be used for crediting any refund or payment due to you. This reduces the inconvenience of collecting and depositing cheques. Refund or payment can be for any of the following matters:

- Excess payment of fees made by you;
- Scholarships and Bursaries awarded; and
- Any other payment due to you.

APPLICATION

- Complete Part I of the Interbank GIRO Application form. You may use your own/parent's/guardian's bank account for the above-mentioned.
- Ensure the signature(s)/thumbprint(s) on the application form are the same as in the bank records. For account operated using thumbprint, you have to go to the bank with your identification to have your thumbprint verified.
- Submit the completed form to Student Service Centre or SP Finance Department
- SP will forward your application to your designated bank for approval.

For full-time diploma and Polytechnic Foundation Programme students, we will notify you of the course fee to be deducted and deduction date at least one week in advance via the ebill that will be sent to your ichat (email) account. You can login to the Student Portal (**https://mike-student.sp.edu.sg**) to view your Student Account and print the Fee Voucher on web. For unsuccessful GIRO deductions, you will be subjected to bank charges imposed by your Bank.

REFUND OF FEES

Students who intend to withdraw from their course must complete a prescribed Withdrawal Form (available at the Student Service Centre and http://www.sp.edu.sg/SSC) and submit it to the Student Service Centre.

For withdrawal received before the commencement of semester, student may obtain a refund of Tuition Fee paid for that semester less an administrative fee of $50 for full-time diploma.

For withdrawal received within the first week of the semester, 75% refund of Tuition Fee paid may be granted.

For withdrawals received after the first week of the semester, there will be no refund of paid Tuition Fee.

Note:

1. **Students' Union Entrance and Subscription Fees are not refundable regardless of withdrawal date.**
2. **All other fees will be refundable for withdrawals received before semester starts and during 1st week of semester.**

E) SUMMARY OF FEES FOR PART-TIME DIPLOMA (AY1819)

TABLE 3: SUMMARY OF FEES FOR PART-TIME DIPLOMA

DIPLOMA IN APPLIED SCIENCES (INDUSTRIAL CHEMISTRY AND LIFE SCIENCES)					
MODULAR CERTIFICATES (MC)	SINGAPORE CITIZENS BELOW THE AGE OF 40	SINGAPORE CITIZENS AGED 40 AND ABOVE	SINGAPORE PR	ENHANCED TRAINING SUPPORT FOR SME SCHEME	WORKFARE TRAINING SUPPORT SCHEME
Certificate in Core Chemistry I and Biosafety	$392.42	$261.62	$1,046.46	$270.17	$147.92
Certificate in Core Chemistry II and Microbiology	$431.66	$287.78	$1,151.11	$297.19	$162.71
Certificate in Laboratory Management and Statistics	$470.91	$313.94	$1,255.75	$324.21	$177.51
Certificate in Applied Chemistry	$470.91	$313.94	$1,255.75	$324.21	$177.51
Certificate in Life Science / Certificate in Chemical Science	$470.91	$313.94	$1,255.75	$324.21	$177.51
Total Course Fees:	**$2,236.81**	**$1,491.22**	**$5,964.82**	**$1,539.99**	**$843.16**

DIPLOMA IN BUSINESS PRACTICE (ACCOUNTING)					
MODULAR CERTIFICATES (MC)	SINGAPORE CITIZENS BELOW THE AGE OF 40	SINGAPORE CITIZENS AGED 40 AND ABOVE	SINGAPORE PR	ENHANCED TRAINING SUPPORT FOR SME SCHEME	WORKFARE TRAINING SUPPORT SCHEME
Certificate in Business Fundamentals	$470.91	$313.94	$1,255.75	$324.21	$177.51
Certificate in Business and Technology	$470.91	$313.94	$1,255.75	$324.21	$177.51
Certificate in Business Management	$470.91	$313.94	$1,255.75	$324.21	$177.51
Certificate in Business and Corporate Finance	$470.91	$313.94	$1,255.75	$324.21	$177.51
Certificate in Business and Accounting Services	$470.91	$313.94	$1,255.75	$324.21	$177.51
Total Course Fees:	**$2,354.55**	**$1,569.70**	**$6,278.75**	**$1,621.05**	**$887.55**

DIPLOMA IN BUSINESS PRACTICE (BUSINESS MANAGEMENT)					
MODULAR CERTIFICATES (MC)	SINGAPORE CITIZENS BELOW THE AGE OF 40	SINGAPORE CITIZENS AGED 40 AND ABOVE	SINGAPORE PR	ENHANCED TRAINING SUPPORT FOR SME SCHEME	WORKFARE TRAINING SUPPORT SCHEME
Certificate in Business Fundamentals	$470.91	$313.94	$1,255.75	$324.21	$177.51
Certificate in Business Processes	$470.91	$313.94	$1,255.75	$324.21	$177.51
Certificate in Business Applications	$470.91	$313.94	$1,255.75	$324.21	$177.51
Certificate in Business Operations	$470.91	$313.94	$1,255.75	$324.21	$177.51
Certificate in Business Services / Certificate in Business Services (Tourism)	$470.91	$313.94	$1,255.75	$324.21	$177.51
Total Course Fees:	**$2,354.55**	**$1,569.70**	**$6,278.75**	**$1,621.05**	**$887.55**

DIPLOMA IN BUSINESS PRACTICE (HUMAN CAPITAL)					
MODULAR CERTIFICATES (MC)	SINGAPORE CITIZENS BELOW THE AGE OF 40	SINGAPORE CITIZENS AGED 40 AND ABOVE	SINGAPORE PR	ENHANCED TRAINING SUPPORT FOR SME SCHEME	WORKFARE TRAINING SUPPORT SCHEME
Certificate in Business Fundamentals	$470.91	$313.94	$1,255.75	$324.21	$177.51
Certificate in Business and Technology	$470.91	$313.94	$1,255.75	$324.21	$177.51
Certificate in Business Management	$470.91	$313.94	$1,255.75	$324.21	$177.51
Certificate in Human Capital	$470.91	$313.94	$1,255.75	$324.21	$177.51
Certificate in Talent Management	$470.91	$313.94	$1,255.75	$324.21	$177.51
Total Course Fees:	**$2,354.55**	**$1,569.70**	**$6,278.75**	**$1,621.05**	**$887.55**

DIPLOMA IN ENGINEERING (CONTROL AND AUTOMATION)					
MODULAR CERTIFICATES (MC)	SINGAPORE CITIZENS BELOW THE AGE OF 40	SINGAPORE CITIZENS AGED 40 AND ABOVE	SINGAPORE PR	ENHANCED TRAINING SUPPORT FOR SME SCHEME	WORKFARE TRAINING SUPPORT SCHEME
Certificate in Electrical and Digital Circuit Fundamentals	$470.91	$313.94	$1,255.75	$324.21	$177.51
Certificate in Electronics	$470.91	$313.94	$1,255.75	$324.21	$177.51
Certificate in PLC and Control System	$470.91	$313.94	$1,255.75	$324.21	$177.51
Certificate in Network and Control	$470.91	$313.94	$1,255.75	$324.21	$177.51
Certificate in Sensors and Fieldbus	$470.91	$313.94	$1,255.75	$324.21	$177.51
Total Course Fees:	**$2,354.55**	**$1,569.70**	**$6,278.75**	**$1,621.05**	**$887.55**

DIPLOMA IN ENGINEERING (MECHANICAL TECHNOLOGY)					
MODULAR CERTIFICATES (MC)	SINGAPORE CITIZENS BELOW THE AGE OF 40	SINGAPORE CITIZENS AGED 40 AND ABOVE	SINGAPORE PR	ENHANCED TRAINING SUPPORT FOR SME SCHEME	WORKFARE TRAINING SUPPORT SCHEME
Certificate in Engineering Drafting & Design	$470.91	$313.94	$1,255.75	$324.21	$177.51
Certificate in Engineering Mechanics & Materials	$470.91	$313.94	$1,255.75	$324.21	$177.51
Certificate in Machining Technology / Certificate in Port Equipment Technology	$470.91	$313.94	$1,255.75	$324.21	$177.51
Certificate in Thermofluids Engineering	$470.91	$313.94	$1,255.75	$324.21	$177.51
Certificate in Automation Technology	$470.91	$313.94	$1,255.75	$324.21	$177.51
Total Course Fees:	**$2,354.55**	**$1,569.70**	**$6,278.75**	**$1,621.05**	**$887.55**

DIPLOMA IN ENGINEERING (POWER ENGINEERING)					
MODULAR CERTIFICATES (MC)	SINGAPORE CITIZENS BELOW THE AGE OF 40	SINGAPORE CITIZENS AGED 40 AND ABOVE	SINGAPORE PR	ENHANCED TRAINING SUPPORT FOR SME SCHEME	WORKFARE TRAINING SUPPORT SCHEME
Certificate in Electrical and Digital Circuit Fundamentals	$470.91	$313.94	$1,255.75	$324.21	$177.51
Certificate in Electronics	$470.91	$313.94	$1,255.75	$324.21	$177.51
Certificate in Electrical Circuits and Systems	$470.91	$313.94	$1,255.75	$324.21	$177.51
Certificate in Power Distribution	$470.91	$313.94	$1,255.75	$324.21	$177.51
Certificate in Power Systems	$470.91	$313.94	$1,255.75	$324.21	$177.51
Total Course Fees:	**$2,354.55**	**$1,569.70**	**$6,278.75**	**$1,621.05**	**$887.55**

DIPLOMA IN ENGINEERING (RAPID TRANSIT TECHNOLOGY)					
MODULAR CERTIFICATES (MC)	SINGAPORE CITIZENS BELOW THE AGE OF 40	SINGAPORE CITIZENS AGED 40 AND ABOVE	SINGAPORE PR	ENHANCED TRAINING SUPPORT FOR SME SCHEME	WORKFARE TRAINING SUPPORT SCHEME
Certificate in Electrical and Digital Circuit Fundamentals	$470.91	$313.94	$1,255.75	$324.21	$177.51
Certificate in Rapid Transit System	$470.91	$313.94	$1,255.75	$324.21	$177.51
Certificate in Signalling, Communication and Control	$470.91	$313.94	$1,255.75	$324.21	$177.51
Certificate in Electrical Systems	$470.91	$313.94	$1,255.75	$324.21	$177.51
Certificate in Communication Systems	$470.91	$313.94	$1,255.75	$324.21	$177.51
Total Course Fees:	**$2,354.55**	**$1,569.70**	**$6,278.75**	**$1,621.05**	**$887.55**

SKILLSFUTURE EARN AND LEARN PROGRAMME LEADING TO PART-TIME DIPLOMA IN ENGINEERING (ELECTRICAL – RAPID TRANSIT TECHNOLOGY)					
MODULAR CERTIFICATES (MC)	SINGAPORE CITIZENS BELOW THE AGE OF 40	SINGAPORE CITIZENS AGED 40 AND ABOVE	SINGAPORE PR	ENHANCED TRAINING SUPPORT FOR SME SCHEME	WORKFARE TRAINING SUPPORT SCHEME
Certificate in Electrical and Digital Circuit Fundamentals *(inclusive of 18 months of On-Job-Training)*	$546.02	$364.01	$1,456.06	$375.92	$205.82
Certificate in Electrical Systems	$470.91	$313.94	$1,255.75	$324.21	$177.51
Certificate in Communication Systems	$470.91	$313.94	$1,255.75	$324.21	$177.51
Total Course Fees:	**$1,487.84**	**$991.89**	**$3,967.56**	**$1,024.34**	**$560.84**

SKILLSFUTURE EARN AND LEARN PROGRAMME LEADING TO PART-TIME DIPLOMA IN ENGINEERING (MECHANICAL – RAPID TRANSIT TECHNOLOGY)					
MODULAR CERTIFICATES (MC)	SINGAPORE CITIZENS BELOW THE AGE OF 40	SINGAPORE CITIZENS AGED 40 AND ABOVE	SINGAPORE PR	ENHANCED TRAINING SUPPORT FOR SME SCHEME	WORKFARE TRAINING SUPPORT SCHEME
Certificate in Engineering Fundamentals *(inclusive of 18 months of On-Job-Training)*	$546.02	$364.01	$1,456.06	$375.92	$205.82
Certificate in Engineering Mechanics	$470.91	$313.94	$1,255.75	$324.21	$177.51
Certificate in Thermofluids Engineering	$470.91	$313.94	$1,255.75	$324.21	$177.51
Total Course Fees:	**$1,487.84**	**$991.89**	**$3,967.56**	**$1,024.34**	**$560.84**

SKILLSFUTURE EARN AND LEARN PROGRAMME LEADING TO PART-TIME DIPLOMA IN APPLIED SCIENCE (CHEMICAL LABORATORY TECHNOLOGY)					
MODULAR CERTIFICATES (MC)	SINGAPORE CITIZENS BELOW THE AGE OF 40	SINGAPORE CITIZENS AGED 40 AND ABOVE	SINGAPORE PR	ENHANCED TRAINING SUPPORT FOR SME SCHEME	WORKFARE TRAINING SUPPORT SCHEME
Certificate in Basic Laboratory Techniques & Safety	$364.01	$242.68	$970.70	$250.61	$137.21
Certificate in Laboratory Instrumentation & Separation Science	$546.02	$364.01	$1,456.06	$375.92	$205.82
Certificate in Laboratory Analysis & Management	$455.02	$303.35	$1,213.38	$313.27	$171.52
Certificate in Organic & Investigative Chemistry	$470.91	$313.94	$1,255.75	$324.21	$177.51
Certificate in Industrial Chemical Applications	$392.42	$261.62	$1,046.46	$270.17	$147.92
Total Course Fees:	**$2,228.38**	**$1,485.60**	**$5,942.35**	**$1,534.18**	**$839.98**

The fees shown (inclusive of 7% GST) are indicative as they are based on prevailing funding policies and subject to review. Module Certificate fee is payable on a semester basis.

OTHER FEES PAYABLE		
PART-TIME DIPLOMA		
OTHER FEES (PER SEMESTER)	SINGAPORE CITIZENS	SINGAPORE PR AND OTHERS
	AMOUNT (INCL GST)	AMOUNT (INCL GST)
Total	$18.78	$34.83

TABLE 4: SUMMARY OF FEES FOR DIPLOMA (CONVERSION) (AY1819)

DIPLOMA (CONVERSION) IN COMPUTER NETWORKING					
POST DIPLOMA CERTIFICATES (PDC)	SINGAPORE CITIZENS BELOW THE AGE OF 40	SINGAPORE CITIZENS AGED 40 AND ABOVE	SINGAPORE PR	ENHANCED TRAINING SUPPORT FOR SME SCHEME	WORKFARE TRAINING SUPPORT SCHEME
Certificate in Network Administration	$389.05	$259.37	$1,037.47	$267.85	$146.65
Certificate in Computer Networking	$583.58	$389.05	$1,556.21	$401.78	$219.98
Total Course Fees:	**$972.63**	**$648.42**	**$2,593.68**	**$669.63**	**$366.63**

DIPLOMA (CONVERSION) IN DIGITAL MEDIA CREATION					
POST DIPLOMA CERTIFICATES (PDC)	SINGAPORE CITIZENS BELOW THE AGE OF 40	SINGAPORE CITIZENS AGED 40 AND ABOVE	SINGAPORE PR	ENHANCED TRAINING SUPPORT FOR SME SCHEME	WORKFARE TRAINING SUPPORT SCHEME
Certificate in Web Design	$389.05	$259.37	$1,037.47	$267.85	$146.65
Certificate in Content Creation	$389.05	$259.37	$1,037.47	$267.85	$146.65
Total Course Fees:	**$778.10**	**$518.74**	**$2,074.94**	**$535.70**	**$293.30**

DIPLOMA (CONVERSION) IN MARITIME BUSINESS MANAGEMENT					
POST DIPLOMA CERTIFICATES (PDC)	SINGAPORE CITIZENS BELOW THE AGE OF 40	SINGAPORE CITIZENS AGED 40 AND ABOVE	SINGAPORE PR	ENHANCED TRAINING SUPPORT FOR SME SCHEME	WORKFARE TRAINING SUPPORT SCHEME
Certificate in Ship Management and Logistics	$411.68	$274.46	$1,097.82	$283.43	$155.18
Certificate in Ship Management and Offshore	$411.68	$274.46	$1,097.82	$283.43	$155.18
Total Course Fees:	**$823.36**	**$548.92**	**$2,195.64**	**$566.86**	**$310.36**

DIPLOMA (CONVERSION) IN WEB AND PROGRAMMING					
POST DIPLOMA CERTIFICATES (PDC)	SINGAPORE CITIZENS BELOW THE AGE OF 40	SINGAPORE CITIZENS AGED 40 AND ABOVE	SINGAPORE PR	ENHANCED TRAINING SUPPORT FOR SME SCHEME	WORKFARE TRAINING SUPPORT SCHEME
Certificate in Web Development Fundamentals	$389.05	$259.37	$1,037.47	$267.85	$146.65
Certificate in Web Programming	$389.05	$259.37	$1,037.47	$267.85	$146.65
Total Course Fees:	**$778.10**	**$518.74**	**$2,074.94**	**$535.70**	**$293.30**

The fees shown (inclusive of 7% GST) are indicative as they are based on prevailing funding policies and subject to review. Post Diploma Certificate fee is payable on a semester basis.

OTHER FEES PAYABLE		
POST-DIPLOMA		
OTHER FEES (PER SEMESTER)	SINGAPORE CITIZENS	SINGAPORE PR AND OTHERS
	AMOUNT (INCL GST)	AMOUNT (INCL GST)
Total	$9.28	$25.33

TABLE 5: SUMMARY OF FEES FOR SPECIALIST DIPLOMA (AY1819)

SPECIALIST DIPLOMA IN BIOMEDICAL ENGINEERING					
POST DIPLOMA CERTIFICATES (PDC)	SINGAPORE CITIZENS BELOW THE AGE OF 40	SINGAPORE CITIZENS AGED 40 AND ABOVE	SINGAPORE PR	ENHANCED TRAINING SUPPORT FOR SME SCHEME	WORKFARE TRAINING SUPPORT SCHEME
Certificate in Fundamentals of Biomedical Engineering	$354.38	$236.26	$945.02	$243.98	$133.58
Certificate in Biomedical Engineering Applications	$531.58	$354.38	$1,417.54	$365.98	$200.38
Total Course Fees:	**$885.96**	**$590.64**	**$2,362.56**	**$609.96**	**$333.96**

SPECIALIST DIPLOMA IN CIVIL ENGINEERING (PRODUCTIVITY & TECHNOLOGY)					
POST DIPLOMA CERTIFICATES (PDC)	SINGAPORE CITIZENS BELOW THE AGE OF 40	SINGAPORE CITIZENS AGED 40 AND ABOVE	SINGAPORE PR	ENHANCED TRAINING SUPPORT FOR SME SCHEME	WORKFARE TRAINING SUPPORT SCHEME
Certificate in Construction Productivity Management	$442.98	$295.32	$1,181.28	$304.98	$166.98
Certificate in Construction Technology	$442.98	$295.32	$1,181.28	$304.98	$166.98
Total Course Fees:	**$885.96**	**$590.64**	**$2,362.56**	**$609.96**	**$333.96**

SPECIALIST DIPLOMA IN COSMETIC SCIENCE					
POST DIPLOMA CERTIFICATES (PDC)	SINGAPORE CITIZENS BELOW THE AGE OF 40	SINGAPORE CITIZENS AGED 40 AND ABOVE	SINGAPORE PR	ENHANCED TRAINING SUPPORT FOR SME SCHEME	WORKFARE TRAINING SUPPORT SCHEME
Certificate in Science in Skin Care Formulation	$422.52	$281.68	$1,126.71	$290.89	$159.27
Certificate in Science in Hair Care Formulation	$422.52	$281.68	$1,126.71	$290.89	$159.27
Total Course Fees:	**$845.04**	**$563.36**	**$2,253.42**	**$581.78**	**$318.54**

SPECIALIST DIPLOMA IN CYBER SECURITY (EARN AND LEARN PROGRAMME)					
POST DIPLOMA CERTIFICATES (PDC)	SINGAPORE CITIZENS BELOW THE AGE OF 40	SINGAPORE CITIZENS AGED 40 AND ABOVE	SINGAPORE PR	ENHANCED TRAINING SUPPORT FOR SME SCHEME	WORKFARE TRAINING SUPPORT SCHEME
Certificate in Cyber Security and Defences	$707.81	$471.87	$1,887.48	$487.31	$266.81
Certificate in Forensics and Investigation	$648.82	$432.55	$1,730.19	$446.70	$244.57
Total Course Fees:	**$1,356.63**	**$904.42**	**$3,617.67**	**$934.01**	**$511.38**

SPECIALIST DIPLOMA IN CYBER SECURITY MANAGEMENT					
POST DIPLOMA CERTIFICATES (PDC)	SINGAPORE CITIZENS BELOW THE AGE OF 40	SINGAPORE CITIZENS AGED 40 AND ABOVE	SINGAPORE PR	ENHANCED TRAINING SUPPORT FOR SME SCHEME	WORKFARE TRAINING SUPPORT SCHEME
Certificate in Infocomm Security and Defences	$437.68	$291.79	$1,167.16	$301.33	$164.98
Certificate in Security Incident Management	$437.68	$291.79	$1,167.16	$301.33	$164.98
Total Course Fees:	**$875.36**	**$583.58**	**$2,334.32**	**$602.66**	**$329.96**

SPECIALIST DIPLOMA IN DATA SCIENCE (ARTIFICIAL INTELLIGENCE)					
POST DIPLOMA CERTIFICATES (PDC)	SINGAPORE CITIZENS BELOW THE AGE OF 40	SINGAPORE CITIZENS AGED 40 AND ABOVE	SINGAPORE PR	ENHANCED TRAINING SUPPORT FOR SME SCHEME	WORKFARE TRAINING SUPPORT SCHEME
Certificate in Fundamentals of Data Science	$389.05	$259.37	$1,037.47	$267.85	$146.65
Certificate in Artificial Intelligence	$389.05	$259.37	$1,037.47	$267.85	$146.65
Total Course Fees:	**$778.10**	**$518.74**	**$2,074.94**	**$535.70**	**$293.30**

SPECIALIST DIPLOMA IN DATA SCIENCE (BIG DATA AND STREAMING ANALYTICS)					
POST DIPLOMA CERTIFICATES (PDC)	SINGAPORE CITIZENS BELOW THE AGE OF 40	SINGAPORE CITIZENS AGED 40 AND ABOVE	SINGAPORE PR	ENHANCED TRAINING SUPPORT FOR SME SCHEME	WORKFARE TRAINING SUPPORT SCHEME
Certificate in Fundamentals of Data Science	$389.05	$259.37	$1,037.47	$267.85	$146.65
Certificate in Big Data and Streaming Analytics	$389.05	$259.37	$1,037.47	$267.85	$146.65
Total Course Fees:	**$778.10**	**$518.74**	**$2,074.94**	**$535.70**	**$293.30**

SPECIALIST DIPLOMA IN DATA SCIENCE (DATA ANALYTICS)					
POST DIPLOMA CERTIFICATES (PDC)	SINGAPORE CITIZENS BELOW THE AGE OF 40	SINGAPORE CITIZENS AGED 40 AND ABOVE	SINGAPORE PR	ENHANCED TRAINING SUPPORT FOR SME SCHEME	WORKFARE TRAINING SUPPORT SCHEME
Certificate in Fundamentals of Data Science	$389.05	$259.37	$1,037.47	$267.85	$146.65
Certificate in Data Analytics	$389.05	$259.37	$1,037.47	$267.85	$146.65
Total Course Fees:	**$778.10**	**$518.74**	**$2,074.94**	**$535.70**	**$293.30**

SPECIALIST DIPLOMA IN DATA SCIENCE (PREDICTIVE ANALYTICS)					
POST DIPLOMA CERTIFICATES (PDC)	SINGAPORE CITIZENS BELOW THE AGE OF 40	SINGAPORE CITIZENS AGED 40 AND ABOVE	SINGAPORE PR	ENHANCED TRAINING SUPPORT FOR SME SCHEME	WORKFARE TRAINING SUPPORT SCHEME
Certificate in Fundamentals of Data Science	$389.05	$259.37	$1,037.47	$267.85	$146.65
Certificate in Predictive Analytics	$389.05	$259.37	$1,037.47	$267.85	$146.65
Total Course Fees:	**$778.10**	**$518.74**	**$2,074.94**	**$535.70**	**$293.30**

SPECIALIST DIPLOMA IN DIGITAL TECHNOLOGIES FOR A SMART CITY					
POST DIPLOMA CERTIFICATES (PDC)	SINGAPORE CITIZENS BELOW THE AGE OF 40	SINGAPORE CITIZENS AGED 40 AND ABOVE	SINGAPORE PR	ENHANCED TRAINING SUPPORT FOR SME SCHEME	WORKFARE TRAINING SUPPORT SCHEME
Certificate in Smart Systems and Cloud Computing	$398.68	$265.79	$1,063.15	$274.48	$150.28
Certificate in Sensors and Mobile Development	$442.98	$295.32	$1,181.28	$304.98	$166.98
Total Course Fees:	**$841.66**	**$561.11**	**$2,244.43**	**$579.46**	**$317.26**

SPECIALIST DIPLOMA IN DIGITAL MARKETING AND ANALYTICS					
POST DIPLOMA CERTIFICATES (PDC)	SINGAPORE CITIZENS BELOW THE AGE OF 40	SINGAPORE CITIZENS AGED 40 AND ABOVE	SINGAPORE PR	ENHANCED TRAINING SUPPORT FOR SME SCHEME	WORKFARE TRAINING SUPPORT SCHEME
Certificate in Digital Marketing Strategies and Analytics	$486.32	$324.21	$1,296.84	$334.82	$183.32
Certificate in Social Media Marketing and Analytics	$486.32	$324.21	$1,296.84	$334.82	$183.32
Total Course Fees:	**$972.64**	**$648.42**	**$2,593.68**	**$669.64**	**$366.64**

SPECIALIST DIPLOMA IN ENERGY EFFICIENCY AND MANAGEMENT					
POST DIPLOMA CERTIFICATES (PDC)	SINGAPORE CITIZENS BELOW THE AGE OF 40	SINGAPORE CITIZENS AGED 40 AND ABOVE	SINGAPORE PR	ENHANCED TRAINING SUPPORT FOR SME SCHEME	WORKFARE TRAINING SUPPORT SCHEME
Certificate in Integrative Energy Efficient Building Design	$354.38	$236.26	$945.02	$243.98	$133.58
Certificate in Energy System Management	$531.58	$354.38	$1,417.54	$365.98	$200.38
Total Course Fees:	**$885.96**	**$590.64**	**$2,362.56**	**$609.96**	**$333.96**

SPECIALIST DIPLOMA IN ENHANCED HUMAN RESOURCE SKILLS					
POST DIPLOMA CERTIFICATES (PDC)	SINGAPORE CITIZENS BELOW THE AGE OF 40	SINGAPORE CITIZENS AGED 40 AND ABOVE	SINGAPORE PR	ENHANCED TRAINING SUPPORT FOR SME SCHEME	WORKFARE TRAINING SUPPORT SCHEME
Certificate in Future Skills in HR	$365.94	$243.96	$975.84	$251.94	$137.94
Certificate in Positive Psychology	$365.94	$243.96	$975.84	$251.94	$137.94
Total Course Fees:	**$731.88**	**$487.92**	**$1,951.68**	**$503.88**	**$275.88**

SPECIALIST DIPLOMA IN FORMULATION SCIENCE AND TECHNOLOGY					
POST DIPLOMA CERTIFICATES (PDC)	SINGAPORE CITIZENS BELOW THE AGE OF 40	SINGAPORE CITIZENS AGED 40 AND ABOVE	SINGAPORE PR	ENHANCED TRAINING SUPPORT FOR SME SCHEME	WORKFARE TRAINING SUPPORT SCHEME
Certificate in Functional Materials for Performance	$469.46	$312.98	$1,251.90	$323.21	$176.96
Certificate in Formulation Design	$469.46	$312.98	$1,251.90	$323.21	$176.96
Total Course Fees:	**$938.92**	**$625.96**	**$2,503.80**	**$646.42**	**$353.92**

SPECIALIST DIPLOMA IN MICROBIOLOGY					
POST DIPLOMA CERTIFICATES (PDC)	SINGAPORE CITIZENS BELOW THE AGE OF 40	SINGAPORE CITIZENS AGED 40 AND ABOVE	SINGAPORE PR	ENHANCED TRAINING SUPPORT FOR SME SCHEME	WORKFARE TRAINING SUPPORT SCHEME
Certificate in Science in Basic Microbiology	$422.52	$281.68	$1,126.71	$290.89	$159.27
Certificate in Science in Applied Microbiology	$422.52	$281.68	$1,126.71	$290.89	$159.27
Total Course Fees:	**$845.04**	**$563.36**	**$2,253.42**	**$581.78**	**$318.54**

SPECIALIST DIPLOMA IN MOBILE APPS DEVELOPMENT					
POST DIPLOMA CERTIFICATES (PDC)	SINGAPORE CITIZENS BELOW THE AGE OF 40	SINGAPORE CITIZENS AGED 40 AND ABOVE	SINGAPORE PR	ENHANCED TRAINING SUPPORT FOR SME SCHEME	WORKFARE TRAINING SUPPORT SCHEME
Certificate in Mobile User Interaction & Programming	$389.05	$259.37	$1,037.47	$267.85	$146.65
Certificate in Mobile Applications & Web Services	$389.05	$259.37	$1,037.47	$267.85	$146.65
Total Course Fees:	**$778.10**	**$518.74**	**$2,074.94**	**$535.70**	**$293.30**

SPECIALIST DIPLOMA IN NETWORK SECURITY					
POST DIPLOMA CERTIFICATES (PDC)	SINGAPORE CITIZENS BELOW THE AGE OF 40	SINGAPORE CITIZENS AGED 40 AND ABOVE	SINGAPORE PR	ENHANCED TRAINING SUPPORT FOR SME SCHEME	WORKFARE TRAINING SUPPORT SCHEME
Certificate in Security & Firewall	$389.05	$259.37	$1,037.47	$267.85	$146.65
Certificate in Wireless & Forensics	$583.58	$389.05	$1,556.21	$401.78	$219.98
Total Course Fees:	**$972.63**	**$648.42**	**$2,593.68**	**$669.63**	**$366.63**

SPECIALIST DIPLOMA IN NUTRITION AND SCIENCE					
POST DIPLOMA CERTIFICATES (PDC)	SINGAPORE CITIZENS BELOW THE AGE OF 40	SINGAPORE CITIZENS AGED 40 AND ABOVE	SINGAPORE PR	ENHANCED TRAINING SUPPORT FOR SME SCHEME	WORKFARE TRAINING SUPPORT SCHEME
Certificate in Nutrition	$422.52	$281.68	$1,126.71	$290.89	$159.27
Certificate in Exercise Science	$422.52	$281.68	$1,126.71	$290.89	$159.27
Total Course Fees:	**$845.04**	**$563.36**	**$2,253.42**	**$581.78**	**$318.54**

SPECIALIST DIPLOMA IN PORT MANAGEMENT AND OPERATIONS (EARN AND LEARN PROGRAMME)					
POST DIPLOMA CERTIFICATES (PDC)	SINGAPORE CITIZENS BELOW THE AGE OF 40	SINGAPORE CITIZENS AGED 40 AND ABOVE	SINGAPORE PR	ENHANCED TRAINING SUPPORT FOR SME SCHEME	WORKFARE TRAINING SUPPORT SCHEME
Certificate in Port Operations	$565.76	$377.18	$1,508.70	$389.51	$213.26
Certificate in Port Management	$226.31	$150.87	$603.48	$155.81	$85.31
Total Course Fees:	**$792.07**	**$528.05**	**$2,112.18**	**$545.32**	**$298.57**

SPECIALIST DIPLOMA IN PROFESSIONAL ACCOUNTING					
POST DIPLOMA CERTIFICATES (PDC)	SINGAPORE CITIZENS BELOW THE AGE OF 40	SINGAPORE CITIZENS AGED 40 AND ABOVE	SINGAPORE PR	ENHANCED TRAINING SUPPORT FOR SME SCHEME	WORKFARE TRAINING SUPPORT SCHEME
Certificate in Financial Accounting & Auditing	$411.68	$274.46	$1,097.82	$283.43	$155.18
Certificate in Finance & Business Management	$411.68	$274.46	$1,097.82	$283.43	$155.18
Total Course Fees:	**$823.36**	**$548.92**	**$2,195.64**	**$566.86**	**$310.36**

The fees shown (inclusive of 7% GST) are indicative as they are based on prevailing funding policies and subject to review. Post Diploma Certificate fee is payable on a semester basis.

OTHER FEES PAYABLE		
POST-DIPLOMA		
OTHER FEES (PER SEMESTER)	SINGAPORE CITIZENS	SINGAPORE PR AND OTHERS
	AMOUNT (INCL GST)	AMOUNT (INCL GST)
Total	$9.28	$25.33

TABLE 6: SUMMARY OF FEES FOR ADVANCED DIPLOMA (AY1819)

ADVANCED DIPLOMA IN APPLIED FOOD SCIENCE (EARN AND LEARN PROGRAMME)					
POST DIPLOMA CERTIFICATES (PDC)	SINGAPORE CITIZENS BELOW THE AGE OF 40	SINGAPORE CITIZENS AGED 40 AND ABOVE	SINGAPORE PR	ENHANCED TRAINING SUPPORT FOR SME SCHEME	WORKFARE TRAINING SUPPORT SCHEME
Certificate in Food Product Innovation	$551.32	$367.55	$1,470.18	$379.57	$207.82
Certificate in Food Processing	$606.45	$404.30	$1,617.20	$417.52	$228.60
Certificate in Food Safety and Quality Management	$606.45	$404.30	$1,617.20	$417.52	$228.60
Capstone Project	$441.05	$294.04	$1,176.14	$303.65	$166.25
Total Course Fees:	**$2,205.27**	**$1,470.19**	**$5,880.72**	**$1,518.26**	**$831.27**

ADVANCED DIPLOMA IN BUILDING AUTOMATION AND SERVICES					
POST DIPLOMA CERTIFICATES (PDC)	SINGAPORE CITIZENS BELOW THE AGE OF 40	SINGAPORE CITIZENS AGED 40 AND ABOVE	SINGAPORE PR	ENHANCED TRAINING SUPPORT FOR SME SCHEME	WORKFARE TRAINING SUPPORT SCHEME
Certificate in Engineering Mathematics & Controls	$354.38	$236.26	$945.02	$243.98	$133.58
Certificate in Building Electrical Services Design	$354.38	$236.26	$945.02	$243.98	$133.58
Certificate in Electric Drives & Programmable Logic Controller	$354.38	$236.26	$945.02	$243.98	$133.58
Certificate in Building Automation & Management Systems	$354.38	$236.26	$945.02	$243.98	$133.58
Total Course Fees:	**$1,417.52**	**$945.04**	**$3,780.08**	**$975.92**	**$534.32**

ADVANCED DIPLOMA IN CHEMICAL ENGINEERING (EARN AND LEARN PROGRAMME)					
POST DIPLOMA CERTIFICATES (PDC)	SINGAPORE CITIZENS BELOW THE AGE OF 40	SINGAPORE CITIZENS AGED 40 AND ABOVE	SINGAPORE PR	ENHANCED TRAINING SUPPORT FOR SME SCHEME	WORKFARE TRAINING SUPPORT SCHEME
Certificate in Chemical Process Principles	$370.76	$247.17	$988.68	$255.26	$139.76
Certificate in Chemical Process Design and Operation	$370.76	$247.17	$988.68	$255.26	$139.76
Certificate in Chemical Process Control, Optimisation and Safety	$476.69	$317.79	$1,271.16	$328.19	$179.69
Capstone Project	$423.72	$282.48	$1,129.92	$291.72	$159.72
Total Course Fees:	**$1,641.93**	**$1,094.61**	**$4,378.44**	**$1,130.43**	**$618.93**

ADVANCED DIPLOMA IN CIVIL ENGINEERING					
POST DIPLOMA CERTIFICATES (PDC)	SINGAPORE CITIZENS BELOW THE AGE OF 40	SINGAPORE CITIZENS AGED 40 AND ABOVE	SINGAPORE PR	ENHANCED TRAINING SUPPORT FOR SME SCHEME	WORKFARE TRAINING SUPPORT SCHEME
Certificate in Construction Productivity Management	$442.98	$295.32	$1,181.28	$304.98	$166.98
Certificate in Construction Technology	$442.98	$295.32	$1,181.28	$304.98	$166.98
Certificate in Civil Engineering Design	$442.98	$295.32	$1,181.28	$304.98	$166.98
Total Course Fees:	**$1,328.94**	**$885.96**	**$3,543.84**	**$914.94**	**$500.94**

ADVANCED DIPLOMA IN POWER ENGINEERING (EARN AND LEARN PROGRAMME)					
POST DIPLOMA CERTIFICATES (PDC)	SINGAPORE CITIZENS BELOW THE AGE OF 40	SINGAPORE CITIZENS AGED 40 AND ABOVE	SINGAPORE PR	ENHANCED TRAINING SUPPORT FOR SME SCHEME	WORKFARE TRAINING SUPPORT SCHEME
Certificate in High Voltage Operation and Protection	$635.58	$423.72	$1,694.88	$437.58	$239.58
Certificate in Power System Planning, Trasmission and Distribution	$635.58	$423.72	$1,694.88	$437.58	$239.58
Certificate in Electricity Acts and Regulations	$582.62	$388.41	$1,553.64	$401.12	$219.62
Total Course Fees:	**$1,853.78**	**$1,235.85**	**$4,943.40**	**$1,276.28**	**$698.78**

ADVANCED DIPLOMA IN POWER SYSTEMS ENGINEERING					
POST DIPLOMA CERTIFICATES (PDC)	SINGAPORE CITIZENS BELOW THE AGE OF 40	SINGAPORE CITIZENS AGED 40 AND ABOVE	SINGAPORE PR	ENHANCED TRAINING SUPPORT FOR SME SCHEME	WORKFARE TRAINING SUPPORT SCHEME
Certificate in Engineering Mathematics & Controls	$354.38	$236.26	$945.02	$243.98	$133.58
Certificate in Power System Analysis & Protection	$354.38	$236.26	$945.02	$243.98	$133.58
Certificate in Power System Transmission & Distribution	$354.38	$236.26	$945.02	$243.98	$133.58
Certificate in Power System Planning, Control & Quality	$354.38	$236.26	$945.02	$243.98	$133.58
Total Course Fees:	**$1,417.52**	**$945.04**	**$3,780.08**	**$975.92**	**$534.32**

ADVANCED DIPLOMA IN PROCESS CONTROL AND INSTRUMENTATION					
POST DIPLOMA CERTIFICATES (PDC)	SINGAPORE CITIZENS BELOW THE AGE OF 40	SINGAPORE CITIZENS AGED 40 AND ABOVE	SINGAPORE PR	ENHANCED TRAINING SUPPORT FOR SME SCHEME	WORKFARE TRAINING SUPPORT SCHEME
Certificate in Engineering Mathematics & Controls	$354.38	$236.26	$945.02	$243.98	$133.58
Certificate in Instrumentation & PLC	$354.38	$236.26	$945.02	$243.98	$133.58
Certificate in Digital Control & Computer Control Systems	$354.38	$236.26	$945.02	$243.98	$133.58
Certificate in Fieldbus Technology & Process Control	$354.38	$236.26	$945.02	$243.98	$133.58
Total Course Fees:	**$1,417.52**	**$945.04**	**$3,780.08**	**$975.92**	**$534.32**

ADVANCED DIPLOMA IN SPECIALTY CHEMICALS					
POST DIPLOMA CERTIFICATES (PDC)	SINGAPORE CITIZENS BELOW THE AGE OF 40	SINGAPORE CITIZENS AGED 40 AND ABOVE	SINGAPORE PR	ENHANCED TRAINING SUPPORT FOR SME SCHEME	WORKFARE TRAINING SUPPORT SCHEME
Certificate in Functional Materials for Performance	$469.46	$312.98	$1,251.90	$323.21	$176.96
Certificate in Formulation Design	$469.46	$312.98	$1,251.90	$323.21	$176.96
Certificate in Civil Engineering Design	$563.36	$375.57	$1,502.28	$387.86	$212.36
Total Course Fees:	**$1,502.28**	**$1,001.53**	**$4,006.08**	**$1,034.28**	**$566.28**

The fees shown (inclusive of 7% GST) are indicative as they are based on prevailing funding policies and subject to review. Post Diploma Certificate fee is payable on a semester basis.

OTHER FEES PAYABLE		
POST-DIPLOMA		
OTHER FEES (PER SEMESTER)	SINGAPORE CITIZENS	SINGAPORE PR AND OTHERS
	AMOUNT (INCL GST)	AMOUNT (INCL GST)
Total	$9.28	$25.33

ACADEMIC CALENDAR FOR AY 2018/2019

Orientation Week (for first-year students only)	**1 week**	**Mon 9.4.2018 – Fri 13.4.2018**
Semester 1		
Term 1	**7 weeks**	**Mon 16.4.2018 - Fri 1.6.2018**
(Mid-Semester Test)	1 week	Mon 28.5.2018 – Fri 1.6.2018*
Vacation	3 weeks	Sat 2.6.2018 - Sun 24.6.2018
Term 2	**8 weeks**	**Mon 25.6.2018 - Fri 17.8.2018**
Exam Week	2 weeks	Mon 20.8.2018 - Fri 31.8.2018**
Vacation	6 weeks	Sat 1.9.2018 - Sun 14.10.2018
Semester 2		
Term 3	**8 weeks**	**Mon 15.10.2018 – Fri 7.12.2018**
(Mid-Semester Test)	1 week	Mon 3.12.2018 – Fri 7.12.2018
Vacation	3 weeks	Sat 8.12.2018 - Tue 1.1.2019+
Term 4	**7 weeks**	**Wed 2.1.2019 – Fri 15.2.2019**
Exam Week	2 weeks	Mon 18.2.2019 - Fri 1.3.2019
Vacation	6 weeks	Sat 2.3.2019 - Sun 14.4.2019

** Vesak Day – 29 May 2018*
*** Hari Raya Haji – 22 August 2018*
+ New Year's Day - 1 January 2019
Vacation – Subject to any polytechnic activities, e.g. internship

Architecture AND THE Built Environment

ARCHITECTURE

CIVIL ENGINEERING WITH BUSINESS

FACILITIES MANAGEMENT

INTEGRATED EVENTS &
PROJECT MANAGEMENT

LANDSCAPE ARCHITECTURE

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THE BUILT ENVIRONMENT

The School of Architecture & the Built Environment is focused on educating and training students to support the built environment industry in Singapore. This involves components of design, infrastructure, construction, facilities and events management set within the environment of Singapore as a **Sustainable City of the Future.**

Being the only polytechnic that provides a full suite of courses to support the built environment industry, our graduates are much sought after to support architects, civil engineers, landscape architects, developers, event organisers, contractors and suppliers to design and enhance our built environment.

They play an important role in creating concepts and designs that are conducive to quality living and a safe and healthy environment to live, work and play. Our students are also trained to use Information Technology and Green Building Technologies in accordance with Building and Construction Authority's (BCA) guidelines. They are also conversant with National Environment Agency (NEA) and Public Utilities Board's (PUB) practices in ensuring that living standards are of world-class status with good environmental management and design of Active, Beautiful and Clean (ABC) waterways.

With Singapore evolving into a SMART nation, our graduates will face challenges in integrating technology with the built environment to create a liveable city. A sustainable environment that would prompt research into special techniques and systems to manage the scarcity of natural resources and energy, and discoveries in sustainable materials. Ecological designs incorporating these innovations and green concepts such as sky gardens are becoming common and it is critical for a team of well-trained staff to work and coordinate with the consultants and specialists. The Singapore Green Plan 2012 maps out this need.

The different strategies highlighted in the government's Singapore Green Plan 2012, the Parks and Waterbodies Plan 2014 and the proposed Master Plan 2014 aim to build townships for all ages that are green, healthy, connected, strong in community interaction and spirit, and to bring quality jobs closer to home. Making Singapore a great city to live, work and play by bringing vibrancy and new characters to Singapore through selected growth areas such as the Jurong Lake District, Kallang riverside, Paya Lebar Central and City Central. The Leisure Plan also covers recreational opportunities for people of all ages and interest to promote a 'Playground-for-All' concept with the injections of waterways and green spaces, art and culture vicinity, and city buzz at various city centres.

The Inter-Ministerial Committee for Sustainable Development (IMCSD) has also unveiled the Sustainable Singapore Blueprint 2015 to make Singapore a sustainable city for a growing nation by 2030.

With all these developments in the pipeline, there will be ample opportunities for graduates in the built environment and design field to contribute to these new challenges to create a sustainable future for Singapore.

INTERNSHIP PROGRAMME

In this programme, students are attached to local and overseas firms and corporate establishments in both the public and private sectors. For the Diploma in Architecture, Diploma in Landscape Architecture and Diploma in Civil Engineering with Business, the students undergo a 12-week internship programme during the semester vacation and academic term after their second year of studies. Diploma in Facilities Management and Diploma in Integrated Events & Project Management students undergo a 22-week internship programme during the semester vacation and one semester after their second year of studies. To instil a global mindset in students, many overseas internship programmes have been arranged in recent years.

During the internship programme, lecturers assume the role of liaison officers to guide the students in contributing towards the establishments they are attached to and to help them maximise learning through real life experiences.

ASSESSMENT AND PROGRESSION OF STUDENTS

For students taking the Diploma in Architecture and Diploma in Landscape Architecture courses, the core modules are mainly year-long modules with 100% in-course assessment. A variety of teaching methods and learning experiences (project-based tutorials, case studies, site visits, study trips and research, as well as written tests) are used to develop confidence, independence and competency. Students work in design studios under the personalised guidance of lecturers on their projects and they learn to present in critique sessions. This practice-oriented training gives students a taste of the 'real' world. A portfolio review is also conducted at the end of each session to review students' overall performance.

Students in the Diploma in Facilities Management course are assessed via a combination of course work over the semester and end of semester examination. Course work is in the form of tutorials, lab/practical work, mini-projects/case studies and tests. Some modules are 100% in-course assessed while others have a semester exam component.

Students in the Diploma in Integrated Events and Project Management course are assessed through a combination of 100% in-course assessment modules and semester examination type modules. In-course assessment is in the form of tutorials, lab/practical work, projects, case studies and tests. Semester exam type modules have an end of semester examination component. Year 2 students have to do an industry-linked project.

Students in the Diploma in Civil Engineering with Business course do a combination of year-long and semester-long modules. Assessment for each module will be by means of continuous course work and semester examinations. Students take a prescribed set of modules in each semester or year. Year 3 students have to do industry-based or applied research projects.

** All full-time diploma students are required to take two compulsory Education and Career Guidance Modules in SP. Students will take SP101A: Education and Career Guidance 1 – Personal Development (15 hours) in their first year. In their second or third year, students will take SP201A: Education and Career Guidance 2 – Career Development (30 hours).*

** All students are required to take one compulsory Sports for Life (SFL) module for one semester in their first year in SP. In their second and third year, students may sign up for SFL module as an elective.*

Diploma in

Architecture

(DARCH)

You will be enrolled into a three-year full-time programme where most core modules are year-long with a 100% in-course assessment approach. Your learning will be facilitated using a unique integrated project-based learning approach. You will be taught architectural design, material and technology, history and theory, environmental science, computer skills and architectural practice from Year 1 to increase your competency, which you will subsequently apply in a crafted design project to enhance your design competency. Pedagogy takes place in unique studio environments, with peer learning and tutor critique sessions forming the backbone of an interactive learning experience. You will be taught to approach understanding architectural practice in a holistic manner, from the conceptual, experimental, historical and theoretical, to the real-world, practical and the hands-on nuts-and-bolts. You will tackle your project brief by integrating design techniques and methodologies, history and theory of architecture, architectural material and technology, environmental science and sustainability, as well as statutory requirements. You will be trained to understand and see value in documenting your design processes, and be made proficient in technical skills dealing with architectural drawings and presentation using several types of software, including CAD, SketchUp and Revit.

Throughout the programme, you will learn to hone critical thinking and decision-making processes in your design, which in turn will help develop your creativity, innovation and entrepreneurship skills. Through a unique internship programme, you will learn to work independently and at the same time learn the values of being a team player. Polytechnic-wide general education modules are incorporated into the curriculum to enable student learning and training to be as broad-based and holistic as possible, and to ensure that you are versatile in the knowledge-based and innovation-based economy.

CAREER PROSPECTS

SP graduates with a Diploma in Architecture can be employed in:

- Architectural consulting firms
- Government agencies like the Building and Construction Authority, Housing and Development Board, Urban Redevelopment Authority
- Organisations related to the building industry
- Large firms in other fields with their own in-house architectural divisions
- Companies providing creative services such as computer graphics and animation design

You could be an:

- Architectural Assistant to support in design, development, documentation and presentation; or
- Architectural Technologist to assist in technical aspects supporting micro design and detailing; or
- Architectural Coordinator on building sites; or
- Specialise in niche architectural areas such as BIM, computational parametric design, sustainability or graphic visualisation that leads to opportunities in senior or director positions in design, technical or project management within architectural firms; or

- Branch into architectural or the built environment related careers such as construction management, building materials/ finishes or architectural products specialists, or developing visualisation or graphics skills for 3D animation and other creative services.

Our graduates have gained direct entry into Year 2 or Year 3 of degree courses in architecture in both local and overseas universities. A number of our outstanding graduates have also been awarded scholarships locally as well as overseas.

SCHOLARSHIPS

Students who excel academically may apply for the following scholarships:

- SP Scholarship
- School of Architecture & the Built Environment Scholarship
- BCA-Industry Scholarship/Sponsorship
- Post-graduate scholarships available include URA, BCA, HDB and Far East Organisation to name a few.

COURSE MODULES

FULL-TIME	FIRST YEAR	HOURS
BE110Z	Architectural Design Studio I	168
BE111Z	History & Theory of Architecture I	84
BE112Z	Materials & Architectural Technology I	168
BE113Z	Environmental Science I	112
BE115Z	Architectural Visual Communication I	84
BE9301/ BE9302/ BE9303	*Vertical Studio Elective	44
LC0154	Communicating for Personal and Team Effectiveness	30
LC0155	Communicating for Project Effectiveness (Proposal)	30
LC8001	General Education 1	30
LC8002	General Education 2	30

FULL-TIME	SECOND YEAR	HOURS
BE120Z	Architectural Design Studio II	168
BE121Z	History & Theory of Architecture II	84
BE122Z	Materials & Architectural Technology II	168
BE123Z	Environmental Science II	112
BE125Z	Architectural Visual Communication II	84
BE9301/ BE9302/ BE9303	*Vertical Studio Elective	44
LC0157	Communicating for Professional Effectiveness	30
LC8003	Social Innovation Project	30
LC8004	General Education 3	30

FULL-TIME	THIRD YEAR	HOURS
BE130Z	Architectural Design Studio III	168
BE131Z	History & Theory of Architecture III	63
BE132Z	Materials & Architectural Technology III	168
BE133Z	Environmental Science III	105
BE134Z	Architectural Practice	42
IA0001	Internship Programme	(12 weeks)
BE9301/ BE9302/ BE9303	*Vertical Studio Elective	44

**Vertical Studio Electives*
A 2-week workshop-based programme that is offered to all years.

Diploma in

Civil Engineering with Business

(DCEB)

Civil Engineering transforms visions of the built environment into reality. It encompasses more than just building new housing estates and MRT lines. It is a challenging and intriguing profession as it is one of the main contributors to the physical world we live in now or in future. Students enrolled into the broad-based and multi-disciplinary Diploma in Civil Engineering with Business (DCEB) course will be equipped with both Civil Engineering and Business knowledge and skills. During the three years of the diploma, students will learn different disciplines of Civil Engineering such as Structural Engineering, Transportation Engineering, Geotechnical Engineering, Geomatics, Environmental and Water Technology, Project Management, Green Buildings for Sustainability and also business modules.

Students' learning will be enhanced with Challenged-Based Learning pedagogy, Conceive-Design-Implement-Operate (CDIO) and out-of-classroom activities. There will be opportunities to work on a challenging, yet fun capstone project each year. In Year 1, students will be challenged with the Tallest Skyscraper model design, the Strongest yet Lightest Bridge in Year 2 and an Earthquake Resistant Structure that will be tested on the Earthquake Simulator in Year 3.

A recent survey of current and prospective students and other stakeholders has revealed the course to be well-accepted and attractive. There is a high demand for our graduates to support the ever-changing man-made living habitats and the built environment.

Exciting projects include the construction of Changi Airport's Jewel and T5, Jurong Lake District, Tuas Megaport, Deep Tunnel Sewage System (Phase 2), Thomson East Coast MRT Line and underground spaces.

The course offers:

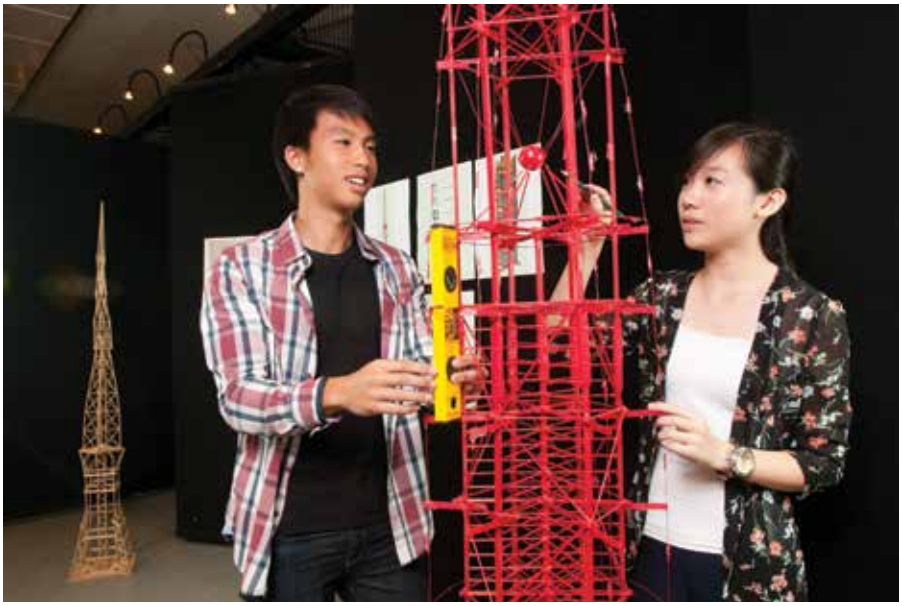
- A 12-week internship/mentorship
- Final Year Projects which may involve collaboration with the industry and R&D areas
- Overseas study trips for global exposure
- A Conceive-Design-Implement-Operate (CDIO) framework that prepares students to be work-ready, life-ready and world-ready
- Three business-related modules

CAREER PROSPECTS

Graduates of this diploma programme will be able to seek rewarding careers with government agencies such as HDB, BCA, URA, JTC, PUB, NEA, SLA and LTA in the development and upkeep of Singapore's civil engineering infrastructure and natural resources. Our graduates are also employed by civil engineering consultants to assist and support engineers and planners. Graduates also work with civil engineering and building contractors.

Over the years, many of our graduates have started their own businesses in many different areas: consultancy, inspection, contracting, management services, specialists subcontracting and materials suppliers for the built and natural environment. They qualify to register under various trade categories with the Building and Construction Authority (BCA) when starting their businesses.

Our graduates can also pursue further studies at local and overseas universities for a degree in civil engineering or in various business options. They are typically given exemptions of at least one year from their degree courses.



SCHOLARSHIPS

Students who excel academically may apply for the following scholarships:

- SP Engineering Scholarship
- School of Architecture & the Built Environment Scholarship
- Yongnam Bursary
- Singapore Structural Steel Society Scholarship
- BCA-Industry Scholarship/Sponsorship
- Yogarajah Scholarship and Bursary Fund
- Sarojini Devi Award
- LTA Engineering Award
- American Concrete Institute (Singapore Chapter) Scholarship

COURSE MODULES

FULL-TIME	FIRST YEAR	HOURS
Year-long		
BE811Z	Introduction to Civil Engineering & Building	90
BE812Z	CAD with Building Information Modeling (BIM)	90
Semester 1		
MS3123*	Basic Mathematics	60
LC0154	Communicating for Personal and Team Effectiveness	30
LC8002	General Education 2	30
Semester 2		
MS3129**	Engineering Mathematics I	60
LC0156	Communicating for Project Effectiveness (Report)	30
LC8001	General Education 1	30
Stage 1A		
BE8103	Economics	45
BE8109	Hydrology & Hydraulics	75
Stage 1B		
BE8101	Geomatics 1 & GIS	75
BE8104	Structural Mechanics	75

FULL-TIME	SECOND YEAR	HOURS
Semester 1		
LC8003	Social Innovation Project	30
Semester 2		
LC8004	General Education 3	30
Stage 2A		
BE8201	Reinforced Concrete Design & CAD	90
BE8207	Civil Engineering Construction & Measurement	90
BE8209	Geomatics 2 & GPS	75
MS3229	Engineering Mathematics II	60
LC0157	Communicating for Professional Effectiveness	30
Stage 2B		
BE8202	Structural Analysis	90
BE8205	Safety, Health & Environmental Management	60
BE8206	Geotechnical Engineering	90
BE8212	Water Technology	90

FULL-TIME	THIRD YEAR	HOURS
Year-long		
BE831Z	Final Year Project	60
Semester 1		
BE8314	Civil Engineering Technology	45
BE8316	Entrepreneurship	45
IA0002	Internship Programme	(12 weeks)
Options for Elective Module 1 and Elective Module 2 (Choose from the SIX modules below)		
BE8300	Green Building Technology	45
BE8301	ABC Waters Design	45
BE8310	Computer Programming with Applications in Civil Engineering	45
BE8317	Structural Inspection & Repair	45
BE8320	Precast & Pre-Stressed Concrete Technology	45
BE8321	Solid Waste Management	45
Semester 2		
BE8306	Civil Engineering Project Management	75
BE8307	Steel Design & CAD	90
BE8313	Transportation Engineering	60
BE8315	Structural BIM e-Submission	60
BE8319	Accounts & Finance	75

* *Those who have credit pass in Additional Mathematics are exempted from MS3123 and will take MS3129 in Semester 2.*
** *Those who passed MS3123 in Semester 1 to take MS3129 in Semester 2.*

Diploma in

Facilities Management

(DFM)

The Diploma in Facilities Management (DFM) is a three-year full-time course that prepares graduates to meet the needs of the increasingly important facilities management industry.

The demand for facilities management services has grown exponentially, with growing demand for building and infrastructure development and increased emphasis on cost efficient and greener buildings.

Facilities Management is a profession encompassing multiple disciplines that integrate people, place, process and technology to ensure the efficient and effective use of facilities for its intended purpose. It is an integrated approach to operate, maintain, improve and adapt the buildings and its infrastructure with the purpose of improving the quality of life of people and optimising the use and management of workplaces to deliver the organisation's strategic objectives.

This course will train students in a combination of facilities management, business and technical skills to develop their versatility and give them a head start in their careers. These include leisure amenities management, procurement, project management, environmental management and sustainability, facilities services management, safety, health and security, building services, fire safety management, town council and strata management, refurbishment and asset enhancement initiatives, marketing and public relations, customer relationship management and emerging information technology in facilities management, among others.

Students' learning will be further enhanced through out-of-classroom activities, study trips and industry-linked projects. In Year 3, students will embark on a semester-long enhanced internship programme that will provide them with opportunities to put classroom knowledge to practice.

Upon successful completion of this course, students will also be awarded with three additional certificates:

- Fire Safety Manager
- bizSAFE Level 2 (Risk Management)
- Supervise Construction Work for WSH

CAREER PROSPECTS

Graduates of this course will find exciting facilities management employment opportunities in hotels, resorts, clubs, leisure industry, serviced apartments, commercial and industrial properties, public and private housing, hospitals and airports, etc.

Some of the positions they can choose to fill include:

- Property Executive
- Facilities Executive
- Managing Agent
- Building Executive
- Project Coordinator
- Contracts/Procurement Executive
- Operations Executive
- Strata Executive
- Customer Service Executive
- Safety & Security Officer
- Fire Safety Manager

Graduates can also gain entry to relevant degree courses from local and overseas universities with module exemptions. Overseas universities normally grant our graduates at least one year of exemption from their three-year degree courses.

INTERNSHIP PROGRAMME

All full-time Year 3 students are divided into two groups. One group will begin with academic modules in Semester 1, and then proceed to participate in an Enhanced Internship Programme in Semester 2. The other group will begin with the Enhanced Internship Programme and continue with academic modules in Semester 2.

SCHOLARSHIPS

Students who excel academically may apply for the following scholarships:

- SP Scholarship
- School of Architecture & the Built Environment Scholarship
- BCA-Industry Scholarship/Sponsorship

COURSE MODULES

FULL-TIME	FIRST YEAR	HOURS
Semester 1		
BE6701	Introduction to Facilities Management	60
BE6702	Building Services 1	60
BE6703	Structure & Fabric	75
BE6704	Principles of Management	60
MS3511	IT & Data Analysis for Business	60
LC8001	General Education 1	30
Semester 2		
BE6705	Facilities Services Management 1	60
BE6706	Law	60
BE6707	Event & Venue Management	60
BE6708	Economics	60
BE6709	Leisure Amenities Management	60
LC0154	Communicating for Personal & Team Effectiveness	30
LC8002	General Education 2	30

FULL-TIME	SECOND YEAR	HOURS
Semester 1		
BE6801	Accounts & Finance	45
BE6802	Building Services 2	60
BE6803	Environmental Management & Sustainability	60
BE6804	Facilities Management & Communications	75
BE6805	Marketing & Public Relations	60
LC0156	Communicating for Project (Report) Effectiveness	30
LC8004	General Education 3	30
Semester 2		
BE6806	Building Defects Diagnosis & Rectification	60
BE6807	Town Council & Strata Management	60
BE6808	Customer Relationship Management	60
BE6809	IT For FM	45
BE6810	Fire Safety Management	60
BE6811	Facilities Services Management 2	60
LC8003	Social Innovation Project	30

FULL-TIME	THIRD YEAR	HOURS
BE6901	Cross Cultural Studies for Business	45
BE6902	Final Semester Integrated Project	30
BE6903	Maintenance of Building Services	60
BE6904	Procurement & Project Management	60
BE6905	Refurbishment & Asset Enhancement Initiatives	60
BE6906	Safety, Health & Security	60
IC0005	Internship Programme	(22 weeks)
LC0157	Communicating for Professional Effectiveness	30

Diploma in

Integrated Events & Project Management

(DEPM)

The Diploma in Integrated Events & Project Management (DEPM) course prepares graduates to meet the needs of the rapidly growing events industry. The Singapore Tourism Board (STB) recognises MICE (Meetings, Incentive travel, Conventions and Exhibitions) as a key area in the promotion of Singapore as a tourist/business travel destination and is committed to building Singapore's leadership position as a top destination for MICE. Today, Singapore is ranked as one of the most popular convention cities in the world having hosted many international events/conventions such as IMF-World Bank meetings and the Singapore International Water Week.

Singapore has also successfully organised various cultural and sports events such as the Chingay Parade, Youth Olympic Games and the Singapore Grand Prix.

In view of the diverse range of events and the skills required, students will be trained with a combination of event management skills, business management skills and technical skills. These include event creation and branding, event marketing and promotion, public relations, logistics, materials, costing and budgeting, audio visual systems, procurement, project management, industry specific IT applications, etc.

DEPM emphasises experiential and authentic learning where students plan and manage school events in Year 1; collaborate with industries for industry-linked events in Year 2 before embarking on a semester-long internship in Year 3. This is further reinforced through out-of-classroom activities such as learning journeys, site visits and competitions locally and overseas.

Besides being work-ready, General Education modules are also incorporated in the curriculum to prepare students to be life-ready and world-ready. Amongst others, students will learn to think critically, develop good analytical skills, enhance their creativity as well as inculcate the right work ethics and values.

CAREER PROSPECTS

Graduates of this course can find suitable employment in the booming events and MICE sectors — event management organisations, venues and service providers, large private sector organisations in all economic sectors such as telcos, media companies, IT companies and banks which organise corporate and promotional activities, government ministries and statutory boards.

Some of the positions they can choose to work in include:

- Event Manager/Executive
- Operations/Project Manager/Executive
- Client Experience Manager/Executive
- Event Marketing and Sales Manager/Executive
- Conference Manager/Executive
- Exhibition Manager/Executive
- Sponsorship Sales Manager/Executive

Graduates can also gain entry to relevant degree courses in local and overseas universities. Overseas universities normally grant our graduates at least one year of exemption from their three-year degree courses.

ENHANCED INTERNSHIP PROGRAMME

All full-time Year 3 students are divided into two groups. One group will begin with the academic modules in Semester 1 before proceeding to participate in an Enhanced Internship Programme in Semester 2. The other group will begin with the Enhanced Internship Programme and continue with the academic modules in Semester 2.

SCHOLARSHIPS

Students who excel academically may apply for the following scholarships:

- SP Scholarship
- School of Architecture & the Built Environment Scholarship
- BCA-Industry Scholarship/Sponsorship

COURSE MODULES

FULL-TIME	FIRST YEAR	HOURS
Semester 1		
BE2501	Law I	45
BE2503	Event Materials & Decoration	45
BE2504	IT Applications for Events I	60
BE2513	Principles of Management	60
BE2515	Event Creation & Market Research	60
LC0154	Communicating for Personal & Team Effectiveness	30
LC8001	General Education 1	30
Semester 2		
BE2506	Event Experience	45
BE2509	Audio Visual Systems	60
BE2510	Economics	60
BE2511	Principles of Marketing	60
BE2512	Design, Drawings & CADD	60
BE2514	Food & Beverages	60
LC8002	General Education 2	30

FULL-TIME	SECOND YEAR	HOURS
Year-long		
BE260Y/Z	Integrated Project	90
Semester 1		
BE2601	Logistics & Site Operations	60
BE2602	Accounts & Finance	45
BE2613	Project Management	60
BE2614	Environmental Safety & Health	60
BE2616	Public Relations	60
LC8003	Social Innovation Project	30
Semester 2		
BE2605	IT Applications for Events II	75
BE2607	Law II	60
BE2612	Event Facilities Construction	60
BE2617	MICE Management	60
LC8004	General Education 3	30
LC0156	Communicating for Project Effectiveness (Report)	30

FULL-TIME	THIRD YEAR	HOURS
BE2707	Event Budgeting & Control	60
BE2711	Entrepreneurship	45
BE2714	Cross Cultural Studies	45
BE2716	Venue & Facilities Management	60
BE2717	Event Tourism & Leisure	45
BE2718	Resource Procurement & Negotiation	45
IC0003	Internship Programme	(22 weeks)
LC0157	Communicating for Professional Effectiveness	30

Diploma in

Landscape Architecture

(DLA)

Diploma in Landscape Architecture is a three-year full-time course that will prepare designers for landscape architecture and allied professions, who are competent in theory and practice in landscape design. A good foundation in horticulture and environmental awareness will balance the emphasis on the integrated design approach of landscape and architecture. The course will prepare work-ready graduates for the industry with life skills and competency in landscape design and construction principles, documentation, presentation and computer drafting skills.Through this practice-oriented training during internship, students also learn to be independent workers as well as team players in landscape architectural practice. General Education modules are also incorporated into the programme to provide a broad-based training for our graduates to be versatile in the knowledge-based economy.

Students will work in design projects with personalised guidance. A variety of teaching methods, such as lectures, case studies, field trips and hands-on practice will be used to facilitate experiential learning. Design presentations will be conducted to allow interactive learning in developing confidence and communication skills.

CAREER PROSPECTS

DLA graduates can be employed in a variety of positions that offer many challenges:

- Assistants to landscape architects, architects, planners and other parallel professions
- Landscape designers in organisations such as National Parks Board, Jurong Bird Park, Singapore Zoological Gardens, Housing and Development Board (HDB), etc.
- Entrepreneurs offering a 'design and build' contract package in landscaping
- Middle management personnel in town councils to coordinate and manage parks and open spaces
- Freelance landscape designers offering design services in the region

COURSE MODULES

All core modules are mainly year-long with 100% in-course assessment. Modules will cover an interesting mix of design, technology, social-environment related domains with generic knowledge for a broad-based training.

SCHOLARSHIPS

Students who excel academically may apply for the following scholarships:

- SP Scholarship
- School of Architecture & the Built Environment Scholarship
- Singapore Garden Society Scholarship
- BCA-Industry Scholarship/Sponsorship

COURSE MODULES

FULL-TIME	FIRST YEAR	HOURS
BE510Z	Landscape Design Studio I	240
BE511Z	Plants & Landscape Technology	180
BE512Z	History & Theory of Landscape Design I	120
BE513Z	Environmental Systems & Processes	120
LC0154	Communicating for Personal & Team Effectiveness	30
LC0155	Communicating for Project Effectiveness (Proposal)	30
LC8001	General Education 1	30
LC8002	General Education 2	30

FULL-TIME	SECOND YEAR	HOURS
BE520Z	Landscape Design Studio II	240
BE521Z	Plants & Sky-Rise Technology	150
BE522Z	History & Theory of Landscape Design II	120
BE523Z	Computer-Aided Design & Presentation	150
BE5200	Project Management in Landscape Architecture I	30
LC0157	Communicating for Professional Effectiveness	30
LC8003	Social Innovation Project	30
LC8004	General Education 3	30

FULL-TIME	THIRD YEAR	HOURS
BE530Z	Landscape Design Studio III	285
IA0005	Internship Programme	(12 weeks)
Stage 3A		
	Elective I *	45
	Elective II *	45
Stage 3B		
BE5300	Plants & Site Planning	120
BE5301	Urban Environment & Society	60
BE5304	Project Management in Landscape Architecture II	30
Options for Electives *		
BE9001	Detailing for Sustainable Design in Architecture & Landscape	
BE9004	Advanced Digital Presentation	
BE9005	Architecture Appreciation	

CONTINUING EDUCATION

Persons holding a relevant SP diploma or equivalent qualification may apply to attend the following extramural courses:

- Advanced Diploma in Civil Engineering
- Assess Building Envelope for Thermal Efficiency
- BIM Basics
- BIM Intermediate
- BIM Advanced
- Environmental Control Officers' Course
- Fire Safety Manager
- GIS Course
- Introduction to WSH (Design for Safety) Regulation
- Real Estate Valuation
- Specialist Diploma in Building Information Modelling Management
- Specialist Diploma in Civil Engineering (Productivity & Technology)
- Strata Management
- Water Efficiency Manager Course
- WDA's WSQ Workplace Safety & Health (WSH) course from Level A to Level D

These courses are offered from time to time. For more information please see our website at www.pace.sp.edu.sg or contact our hotline at: 6772 1288 or e-mail us at: pace@sp.edu.sg

DESIGN STUDIOS LABORATORIES/ WORKSHOPS

The **Architectural Research Centre (ARC)** are facilities to display students' works, hold briefings and activities for staff and students as well as to keep teaching resources. It is equipped with architectural building samples, product catalogues, and other resources for students' self-learning. The exhibition of good student works help to promote the courses to visitors from secondary schools as well as from universities.

The **Dream Builders 1 and Dream Builders 2** provide holistic lab environment for students to experiment Project and Challenge Based pedagogies through CDIO framework to cultivate the "I Dream", "I Can" and "I Want" attitude. The labs are not only equipped with a range of structural, material, geotechnical and building diagnostical equipment for students' experiments, but also cater for the needs of project work with design and prototyping elements. Being developed to be a showcase for exhibiting outstanding students' project work, the labs are ideal for hosting competitions and conducting school promotion and student activities to foster the vertical and horizontal linkages among the students, users and visitors.

The **FM Lab** is integrated with the **Building Services Lab** to provide learning spaces for building services and facilities management training. The learning centre has a mock-up front desk, a food and beverage area, a fire command centre, which are well equipped with furniture, building services equipment and fixtures such as sanitary, electrical, lighting, air-conditioning, fire safety, security and telecommunication systems, etc. to enhance the teaching of both the building services as well as the facilities management modules.

The **CE e-Studios** consist of two labs, equipped with more than 20 iMac PC systems. The studios provide facilities for students to use specialised computer software for their assignments during the course of studies. Some of these software are ArcGIS suite, SAP2000 and Autodesk suites of products and BIM tools. In these labs, Adobe suite of software are also available for students.

The **Design Studios** are equipped with 2D documentation and 3D modeling and visualisation software such as SketchUp Pro and Autodesk suite to facilitate studio-based teaching and learning. The design studios are designed to encourage personalised guidance by lecturers through interaction during tutorials. Students' works are also displayed for independent learning and sharing among peers. In addition, a laser cutter is set up in one of the studios that caters for the needs of physical model making and design. 3D Milling machine as well as 3D printers are also available for students' use.

The **Environmental Lab** is equipped with analytical instruments for the testing of water and wastewater samples, jar tests and hydrology studies, testing equipment for measurements in pipe and open channel, determination of pipe friction and fitting losses and the study of open channel flow characteristics. Hands-on experiments are designed to help students reinforce their understanding of modules such as Water Technology and Hydrology & Hydraulics.

The **Geomatics Laboratory** has state-of-the-art surveying instruments that integrate and automate the process of data acquisition and mapping. These instruments include survey-grade GPS receivers, Total Stations, robotic total stations, digital levels and optical levels. With these resources, the lab provides support in teaching and training DCEB students in the field of Geomatics. The laboratory also provides technical support to external organisations for R&D and industry-linked projects. In addition, the Geomatics Lab is a Registered Research Lab of Intergraph and a subscriber to the Singapore Land Authority (SLA) SiReNT (Singapore Satellite Positioning Reference Network) Services, which include Real Time Kinematic (RTK) and Differential Global Positioning System (DGPS), for rapid GPS data acquisition.

The **Landscape Outdoor Learning Laboratory** provides facilities for hands-on activities in horticulture, plant propagation and landscape design construction. There is an enclosed nursery with propagation sheds and propagation facilities, and a linear stretch of turf area for landscape design construction and testing. In the nursery, students will learn the different methods of plant propagation such as marcotting, grating and by cuttings. They will be able to mix different types of planting media and experience basic plant maintenance and plant identification. The landscape construction and testing area, allows students to work with the hardscape materials and the various techniques of planting methods. The test area is integrated with the surrounding landscape and provided with facilities for 'Talk cum Workshops' to be carried out in an outdoor environment.

The **Events Space** is an incubating ground for students to learn, plan and simulate different events through a versatile mini performing theatre integrated with an exhibition hall. This laboratory also provides the learning space for interactive learning through experimentation with audio visual systems and its effects on common event backdrops.

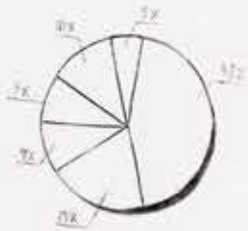
The **Project Laboratory** is equipped with facilities and tools to support students in the exploration of their project and design through working with materials and models. The laboratory is well maintained according to the relevant environmental health and safety requirements and standards.

The **Plotter Room** is equipped with laser printers and colour plotters to facilitate printing by staff and students.

The **FM e-Studios** consist of two labs, equipped with more than 12 PC systems. The studios provide facilities for students to use specialised computer software for their assignments and course of studies. Some of these software are Adobe suite and Autodesk suite, as well as OPERA system. The labs are also equipped with scanning and printing services.

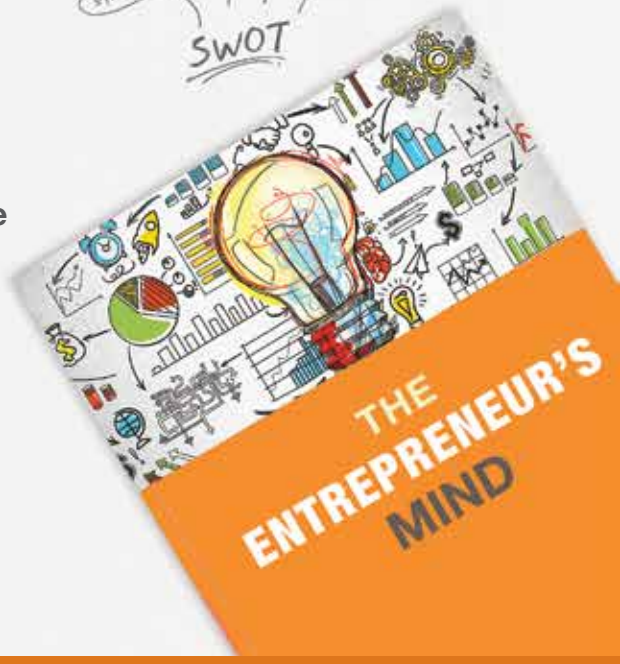
The **Event Management Office** is equipped with essential office facilities to support students in the conduct of their event projects. It provides a conducive space for students to meet, communicate and execute their event projects.

The **Black Box** is another space to facilitate students' exploration of event ideas. It is designed with a vibrant ambience and writable walls to encourage students' active visualisation and verbalisation of their event concepts and processes. Excellent works of students are also displayed here for sharing among peers.



Business

ACCOUNTANCY
BANKING & FINANCE
BUSINESS ADMINISTRATION
FINANCIAL INFORMATICS
HUMAN RESOURCE MANAGEMENT
WITH PSYCHOLOGY
TOURISM & RESORT MANAGEMENT



With SP, it's So Possible

SP | BUSINESS SCHOOL

SP Business School provides a rigorous and holistic curriculum, thus ensuring that SP students learn practical skills to meet the challenges of work life. Graduates of the school will be well-rounded individuals who are coherent, dependable and eager: qualities that employers look for. Flexibility and choices of study specialisations are other key aspects of the SP Business School curriculum.

The committed faculty members of the school include experienced accountants, specialists in banking and finance, marketing specialists, HR professionals, travel and tourism experts, management and business analytics experts, and entrepreneurs.

The complete list of full-time courses and options is as follows:

DIPLOMA IN ACCOUNTANCY (DAC)

DIPLOMA IN BUSINESS ADMINISTRATION (DBA) WITH OPTIONS IN:

- Marketing Management
- Operations Management
- Entrepreneurship

DIPLOMA IN BANKING & FINANCE (DBKF)

DIPLOMA IN FINANCIAL INFORMATICS (DFI)

DIPLOMA IN HUMAN RESOURCE MANAGEMENT WITH PSYCHOLOGY (DHRMP)

DIPLOMA IN TOURISM & RESORT MANAGEMENT (DTRM)

DIPLOMA IN ENGINEERING WITH BUSINESS (DEB)

CURRICULUM EMPHASIS

The curriculum for each course offered by the school emphasises the following:

- Teaching business competencies and lifelong learning skills
- Encouraging a spirit of business innovation through design thinking and a global mindset
- Providing realistic and practical training
- Enhancing employment opportunities through a fine blend of broad and specialised knowledge provided in each course

Choice, relevance and quality are key considerations in the school's approach to curriculum design.

Students may choose any one of the courses or areas of study as listed based on their interests and aptitude. In addition, students may select elective modules to enhance their understanding of their chosen area of specialisation. All SP students will also be required to take the General Education modules over their three-year course of study. More information about the General Education modules can be found in this Prospectus under the chapter on synopses.

INTERNSHIP PROGRAMMES

Students from Accountancy, Banking & Finance, Business Administration, Financial Informatics, Human Resource Management with Psychology, and Tourism & Resort Management go through a comprehensive internship programme, ranging from 12 to 22 weeks, during their final year of study to gain valuable work experience and market skillsets in relevant industry sectors of the economy.

SP BUSINESS SCHOOL VITAL PROGRAMME

SP Business School VITAL Programme stands for the School's Value-Added International Training and Learning Programme. The school organises overseas industrial training programmes, overseas internships, overseas immersion and overseas credit transfer programmes with reputable universities to enrich and enhance the learning experiences of students.

OTHER COURSES OFFERED

The school also offers the following courses:

- Diploma in Business Practice (Accounting)
- Diploma in Business Practice (Business Management)
- Diploma in Business Practice (Human Capital)
- Diploma (Conversion) In Marketing Management
- Specialist Diploma in Digital Marketing and Analytics
- Specialist Diploma in Enhanced Human Resource Skills
- Specialist Diploma in Professional Accounting
- Certificate in Accounting
- Certificate in Applied Psychology
- Certificate in Business

Additionally, the school develops and conducts short courses and executive development programmes for our industry partners to meet specific needs of industry.

ADMISSIONS

Details on entry requirements for all courses are described in this Prospectus under the chapter on admissions.

ASSESSMENT & PROGRESSION OF STUDENTS

Depending on the nature of a module, the final grade for a module is based on:

- continual assessments and an end-of-semester written examination, or
- 100% in-course assessments.

SCHOLARSHIPS

Outstanding SP Business School students will be eligible for the prestigious SP Scholarships. In addition, business students may apply for the SP Outstanding Talent Programme (SPOT) as well as other scholarships through the Department of Student Development.

COURSE STRUCTURE (DAC, DBA, DFI, DBKF, DHRMP, DTRM)

All full-time students in SP Business School attend a common programme in Year 1. The level of specialised training usually increases as a student progresses from Year 2 to Year 3 of study.

COURSE MODULES

FULL-TIME	FIRST YEAR	HOURS
BA0275	Business Accounting	90
BA0300	Business and Technology	60
BA0358	Fundamentals of Marketing	90
BA0316/ BA0392	Emotional Intelligence / Business Negotiation Skills	45
BA0508	Economics	90
BA0509	Management and Human Resource Practices	90
LC8001	General Education 1	30
LC8002	General Education 2	30
MS1100	Business Statistics	60
MS1522	IT and Data Analysis for Business	60
	Elective	45/60

** All full-time diploma students are required to take two compulsory Education and Career Guidance Modules in SP. Students will take SP101A: Education and Career Guidance 1 – Personal Development (15 hours) in their first year. In their second or third year, students will take SP201A: Education and Career Guidance 2 – Career Development (30 hours).*

** All students are required to take one compulsory Sports for Life (SFL) module for one semester in their first year in SP. In their second and third year, students may sign up for SFL module as an elective.*

Diploma in

Accountancy

(DAC)

SP was the first institution in Singapore to train accountants in the 1950s. Many of our accountancy graduates are partners in accounting firms, Chief Executive Officers and Directors of multinational companies.

As the premier training institution in accountancy, the school has constantly maintained the quality and industry relevance of the Diploma in Accountancy (DAC) course. Currently, the course is designed to prepare graduates to pursue the professional accountancy route. All DAC students are trained in technical skills in accounting, auditing, taxation and financial analysis.

ACCELERATED PATHWAY TO CHARTERED ACCOUNTANT QUALIFICATION

DAC works closely with the Institute of Chartered Accountants in England and Wales (ICAEW) to create an accelerated pathway for our graduates to pursue the Chartered Accountant qualification through the SP-ICAEW Professional Chartered Accountancy (PCA) programme.

PRACTICAL TRAINING

Our unique and interactive pedagogies through simulated cases, flipped classroom and team-based learning allow students to not only acquire technical skills but also essential soft-skills such as communication, teamwork, problem-solving and life-long learning skills. Students have the flexibility to choose from various electives to further broaden and deepen their knowledge and skills. In the final year of study, all students will undergo a 22-week practice industry work experience through local and overseas internships with our reputable and varied industry partners.

CAREER PROSPECTS

DAC graduates have excellent job prospects and many graduates receive several job offers upon graduation. The versatility from the various electives offered and the combination of technical accounting skills with hands-on practical training ensure that our DAC graduates are work-ready and able to value add in their organisations.

OPPORTUNITIES FOR PROFESSIONAL STUDIES AND DEGREE COURSES

DAC students will get a head-start in acquiring professional qualifications whilst in the polytechnic, such as the ICAEW Certificate in Finance, Accounting and Business (CFAB), the Diploma in Management Accounting with the Chartered Institute of Management Accountants (CIMA) and the Association of Chartered Certified Accountants (ACCA) qualifications through the ACCA Accelerated Pathway Programme (AAPP).

Graduates will also receive generous exemptions from the above-mentioned professional bodies should they wish to further their studies with them. Should you choose to start working after your diploma, you may wish to pursue the part-time Specialist Diploma in Professional Accounting offered by SP to deepen your knowledge and prepare yourself for higher appointments in professional accounting. The Specialist Diploma also equips students with the relevant technical knowledge to seek external certifications with the professional bodies and work towards becoming a Chartered Accountant. You may also consider the Advanced Diploma in Accountancy offered under the SkillsFuture Earn and Learn Programme (ELP) to progress to the Singapore CA Programme to attain the Chartered Accountant of Singapore designation.

Our diploma is also well-recognised in both local and overseas universities. Graduates may be granted up to one and a half years exemption from a typical three-year related degree courses by overseas universities.

COURSE MODULES

FULL-TIME	FIRST YEAR	HOURS
See common Year 1 core modules (page 74)		

FULL-TIME	SECOND YEAR	HOURS
Semester 1		
BA1260	Financial Accounting	90
BA1262	Cost & Management Accounting	90
BA1264	Auditing	75
BA1266	Taxation	75
LC8003	Social Innovation Project	30
Semester 2		
BA1261	Advanced Financial Accounting*	60
BA1263	Advanced Cost & Management Accounting*	60
BA1265	Advanced Auditing*	60
BA1267	Advanced Taxation*	60
BA2107	Business Analytics	60
LC0757	Communicating for Professional Effectiveness	30
LC8004	General Education 3	30
	Elective module	60

**Choice of two out of four advanced modules*

FULL-TIME	THIRD YEAR	HOURS
In the third year, students will be divided into two groups. One group will go on internship in Semester 1 and take five modules in Semester 2. The other group will take five modules in Semester 1 and go on internship in Semester 2.		
Semester 1 and Semester 2		
IC7009	Internship Programme	22 weeks
Semester 1 and Semester 2		
BA1253	Integrated Accounting Practice#	90
BA1270	Client Project#	90
BA1268	Business & Company Law	90
BA1269	Business Strategy & Ethics	60
BA2087	Financial Management	60
	Elective module	60

#Choice of one out of two modules

Diploma in

Business Administration

(DBA)

If you want to be a successful business achiever in today's competitive environment, the Diploma in Business Administration (DBA) is the right course for you! DBA develops versatile leaders, entrepreneurs and industry captains who create value for their organisations and communities.

DBA covers a broad spectrum of business disciplines encompassing critical skills such as design thinking and business analytics. Flexible learning options within a supported curriculum structure is the winning combination that will support your achievements. After Year 1, DBA allows you the freedom to personalise your study path by choosing one out of three options. You may concentrate on Marketing, Operations or Entrepreneurship in line with your personality, interests and career aspirations in Year 2. This allows you to become a successful 'T-Shaped' graduate with depth of expertise in your respective specialties and breadth of business knowledge across essential business disciplines.

In Year 1, you will learn the vital business concepts and ideas in business. Through weekly lessons of Education and Career Guidance (ECG) and learning journeys, you will be empowered in selecting the right option, bringing you closer to your dreams and career aspirations.

In Year 2 and Year 3, through interactive lessons and working on client-based projects, you will build deep skills in your selected business functions/ industries. Your competitive edge will be sharpened with the building of core skills such as business analytics and design thinking. Global perspectives and developing understanding of the complex external environment will be infused in all modules. You will also learn about business operations and processes which inculcate commitment to business excellence and efficiency.

At DBA, you will:

- build strong foundation in business and management concepts
- make a difference, turning ideas into actions
- understand and use data in decision-making
- develop consumer/user empathy
- develop a global perspective

The three options offered to enhance student's skills and competencies are:

- MARKETING MANAGEMENT
- OPERATIONS MANAGEMENT
- ENTREPRENEURSHIP

MARKETING MANAGEMENT (MM)

Marketing is an indispensable function within any organisation. Not only does it help an organisation to position its products and services in the desired image to attract and retain customers, it also builds and creates an organisation's most important asset – brand equity! The marketing field thus provides a wide range of exciting career opportunities.

The option consists of seven option modules and two electives. MM students will gain specialisation in Marketing from Year 2 onward, where they learn how to conduct marketing research to understand the needs and wants of their target consumers. They will reach out to their prospective customers by understanding their decision-making process with insights using Consumer Psychology.

MM students will also gain hands-on exposure to integrated marketing communications, retail management and digital marketing equipping them with useful skills and knowledge to excel in tomorrow's competitive business landscape. Apart from an internship programme where students get the opportunity to work with reputable industry partners in marketing, they will also be involved in marketing focused client-based capstone projects. The marketing specialisation through DBA is deliberately designed to differentiate our graduates, promoting their employability as a marketing professional.

MM graduates are well positioned to start work as an executive in marketing departments or functions. They can also find exciting and gainful careers in digital marketing, social media marketing, event management, advertising and public relations.

OPERATIONS MANAGEMENT (OM)

Operations is the heart of any organisation, be it a private company, non-profit, manufacturing, service-oriented or government organisation. A company with good operations can have a significant impact on its competitiveness and profitability. Operations also improves product and service quality. This option is designed to provide students with specific training and education in operations management which focus on smooth flow of products and services between businesses and their key stakeholders.

Students will embrace the essential techniques necessary for designing, managing and improving operations and processes in major types of business. The option emphasises both hands-on and analytical decision-making skills. OM consists of seven option modules. The modules will develop students' understanding on key processes in business that create value. Students will be taught current concepts in procurement and logistics operations, supply chain, international trade operations, productivity management, quality and lean management. In Year 3, OM students will apply their knowledge and skills on client-based capstone projects. They will also embark on their internship. Students will be exposed to a suite of industry relevant software applications and technology. They will also participate in field trips, which add realism and provide industry exposure.

Qualified professionals for operations-related positions continue to be in high demand globally. Students with this specialisation can join local companies or multi-national companies as executives in diverse areas such as operation management, project management, supply chain management, procurement, and quality management.

ENTREPRENEURSHIP (ENT)

The Entrepreneurship option attracts a special breed of potential talents, those who are focused, resilient and daring. Enterprises drive the economy, creating social and economic value by focusing on idea generation, opportunity recognition, and entrepreneurial management.

This option has eight specialised modules and two electives. ENT students will be immersed in the entrepreneurial ecosystem early to learn to shape entrepreneurial opportunities, assess financial feasibility of ventures, while living an entrepreneurial experience.

Starting with foundation modules in Year 1, such as basic marketing and accounting, ENT students are immersed in the enterprise environment very quickly, developing their entrepreneurial mind-set in Year 2 with modules in business opportunities and the innovation process. For this, they are trained in design thinking and are taught to leverage on business analytics.

The ENT option adopts a student-focused approach to teaching and learning, supporting them with opportunities and experiences in platforms such as pitching sessions, industry mentoring, makers faires, hackathons/ hackfests and competitions. Students learn how to assess market feasibility for their ideas, and learn business fundamentals such as branding and finance. The course inculcates strong and sharp business acumen, risk-taking capabilities, effective marketing, and resources management skills, in ensuring business viability.

The ENT option seeks to inculcate creativity skills, a daring outlook, "can-do" attitude, resilience and "out-of-the-box" thinking skills. Its curriculum features the Entrepreneurship Practicum in Year 3. This option provides the hands-on experiential learning and training towards business start-ups and their registration through ACRA. Student entrepreneurs also benefit from financing, seed-funding and access to mentorship from industry and angel investors.

Skills and competencies gained in the ENT option are valuable to diverse organisations including nascent start-ups, family businesses, and non-profit organisations. Graduates from this option can confidently run their own businesses, while others are sought-after in organisations that value talents with competencies which can turn ideas or projects into successful endeavours.

OPPORTUNITIES FOR OVERSEAS PROGRAMMES

In Year 3, students can gain invaluable global perspective with the option of going for an overseas internship in China or on the Tri-city Study Mission, a specially designed overseas programme to give students a first-hand experience of living, studying and working on real-client projects in three cities in Asia. This programme will help students to acquire cultural, country and competitive intelligence.

OPPORTUNITIES FOR ENHANCED INTERNSHIP

In their last semester, students will embark on a compulsory 22-week internship. Students will be attached to companies which are passionate about developing and training young talents with their in-house training or junior management trainee programmes.

APPLIED LEARNING FACILITIES

There are teaching facilities such as "Thinkcubators 1 & 2" and "Enterprise Hub" which enable students to learn in collaborative environment. Product display shelves, observation windows, photography platforms and display cubes for product showcasing are some key facilities to faciliate learning.

FULL-TIME	FIRST YEAR
See common Year 1 core modules (page 74)	

FULL-TIME	SECOND YEAR	HOURS

From Year 2 onwards, DBA students will pursue one of three options, choosing Marketing Management, Operations Management or Entrepreneurship. In Year 2 and Year 3, they will take a combination of core modules and option modules. Students will also embark on 22-week Internship in Year 3.

Core Modules

Semester 1 and Semester 2

BA0209	Financial & Management Accounting	60
BA0377	Service Experience & Innovation	60
BA0382	Business Operations & Processes	60
BA2087	Financial Management	60
BA2107	Business Analytics	60
LC8003	Social Innovation Project	30
LC8004	General Education 3	30
BA0369	Professional Preparation	45

For Marketing Management Option Students

Semester 1 and Semester 2

BA0347	Marketing Intelligence & Research	60
BA0348	Consumer Psychology	60
BA0378	Customer Service & Sales Management	60
BA0383	Brand Management	60
BA0384	Retail Management	60

For Operations Management Option Students

Semester 1 and Semester 2

BA0379	Logistics Operations	60
BA0399	International Trade Operations	60
BA0391	E-Commerce Operations & Technology	60
BA0905	Global Supply Chain Management	60
BA2307	Enterprise Business Processes	60

For Entrepreneurship Option Students

Semester 1 and Semester 2

BA0380	Business Opportunity	60
BA0381	Business Innovation & Process	60
BA0386	Market Feasibility & Branding	60
BA0387	Start-up Finance	60
BA0389	Digital Marketing	60

FULL-TIME	THIRD YEAR	HOURS

Core Modules

Semester 1 and Semester 2

BA0176	Global Business Environment	60
BA0400	Business Law	60
	Elective^	45/60

For Marketing Management Option Students

Semester 1 and Semester 2

BA0374	Integrated Digital Marketing Communications	90
BA0388	Applied Industry Project	90
IC7002	Internship Programme @	22 weeks

For Operations Management Option Students

Semester 1 and Semester 2

BA0385	Service Operations	90
BA0488	Applied Industry Project	90
IC7002	Internship Programme @	22 weeks

Entrepreneurship Option Students

Semester 1 and Semester 2

BA0352	Entrepreneurship Practicum 1	120
BA0353	Entrepreneurship Practicum 2	22 weeks
BA0397	Leadership & Project Management	60

^ Elective offered by SP Business School or other Schools.

@ Students will embark on 22-week internship either in semester 1 or 2 (flip-flop basis)

CAREER PROSPECTS

The versatility of the DBA course prepares students for a business career in various sectors and industries. As such, plenty of employment and career opportunities await those wish to progress in the world of entrepreneurship, business, management and public service.

FURTHER STUDIES

Our DBA course is well-recognised by all local universities and many overseas universities. DBA graduates will be able to pursue further studies and enjoy generous advanced standing status that usually allows them to enrol in the second year of some degree programmes.

Diploma in

Banking AND Finance

(DBKF)

Designed for future financial professionals who want to make an impact in the complex global economy, the Diploma in Banking and Finance— known as DBKF — gives you a head start in being a responsible and insightful wealth creator.

The DBKF course blends theoretical concepts with industry practices. This well-established course provides practical training with modern facilities and an excellent curriculum that is closely related to professional practices and is highly industry relevant. Besides acquiring core competencies in banking and finance, you are also equipped with essential business skills such as integrative problem solving, critical thinking, effective communication and teamwork, as well as key industry soft skills and sound values for work.

The 3-year full-time DBKF programme, builds upon 3 main pillars crucial to banking and finance industry, namely (1) Corporate and Wealth Advisory, (2) Risk and Compliance and (3) Financial Management.

Beyond the technical competencies, latest innovations such as Financial Technology (FinTech) and Data Analytics skills are blended into the programme, to equip you for the future economy. You will be encouraged to adopt a critical and flexible viewpoint and to analyse issues from a variety of perspectives.

ACADEMIC INNOVATION

The programme will develop you to be future finance professionals with the mastery of both theory and skillsets that are needed to navigate the evolving world of finance.

"Hands-on learning" is fundamental to the SP DBKF experience. There will be opportunities for you to acquire real-life experience through a variety of local and overseas programmes.

You will go on a 22-week internship in your final year. Depending on your career preference, you may choose an internship with financial institutions, such as Monetary Authority of Singapore, HSBC, OCBC, DBS and other leading organisations. Beyond the classroom, you have the opportunity to work on industry/data analytic projects, excel in competitions, network at seminars and during job shadowing, go on field trips and volunteer for overseas social innovation projects that let you have an impact on the wider world.

FLEXIBILITY AND MULTIPLE PATHWAYS

You are able to chart your own pathway through a variety of electives offered at various stages of the programme. Electives include Forex Trading, Commodities Trading, Technical Analysis and Trading, and many more.

For students who wish to learn financial trading skills, you will have simulated hands-on trading exercises in the School's UOB Kay Hian–SP Dealing Centre in some electives.

CAREER PROSPECTS

As Singapore continues to thrive as an international financial hub, there are good employment opportunities.

Almost 90% of our graduates surveyed found jobs in 3 months after graduation last year, according to the Graduate Employment Survey 2016. More than 80% of these graduates found permanent jobs related to their field of study.

Graduates are skilled for roles in a wide variety of functions, including credit and marketing, trade finance, retail and branch banking, treasury, private banking and financial planning, research, risk compliance, administrative support in banks, stock brokerages, fund management companies, the Singapore Exchange, as well as corporations.

FURTHER STUDIES

Graduates from this course have the flexibility to further their studies in reputable local and foreign universities.This course offers you advanced standing at certain overseas universities, allowing enrolment in the second year of a three-year degree programme. Graduates can pursue professional certifications offered by institutions such as the Association of Chartered Certified Accountants (ACCA), the Institute of Chartered Accountants in England and Wales (ICAEW), Chartered Institute for Securities and Investment (CISI), etc. For industry-related certification, you can also sit for the Capital Markets and Financial Advisory Services (CMFAS) examinations.

COURSE MODULES

FULL-TIME	FIRST YEAR
See common Year 1 core modules (page 74)	

FULL-TIME	SECOND YEAR	HOURS
Semester 1		
BA0209	Financial and Management Accounting	60
BA2056	Financial Markets & Institutions	60
BA2080	Customer Service Experience	60
BA2107	Business Analytics	60
BA2211	Enterprise Risk Management	60
LC8004	General Education 3	30
	ELECTIVE	60
Semester 2		
BA2034	Corporate Finance	60
BA2081	Equities and Fixed Income Analysis	60
BA2045	Financial Planning	60
BA2082	Financial Regulations and compliance	60
	ELECTIVE	60
LC8003	Social Innovation Project	30
ST3001	Web Stack for Business	60

FULL-TIME	THIRD YEAR	HOURS
Semester 1		
BA2059	Credit Analysis and Management	60
BA2083	Treasury and Derivatives	60
BA2048	International Trade Finance & Documentation	60
BA0400	Business Law	60
BA2084/ BA2021	Final Year Project or Portfolio Management	90
	ELECTIVE	60
Semester 2		
IC7004	Internship Programme (with FinTech Option)	250

Please note that the curriculum is subject to changes.

Diploma in

Financial Informatics

(DFI)

Diploma in Financial Informatics (DFI) develops you to be tomorrow's professionals in enterprise risk management and business analytics.

The course is anchored in three pillars: enterprise risk management, analytics & technology. It gives an integrated overview of how finance theory and computing techniques are applied to the finance sector and risk management functions. Graduates will be equipped with knowledge and skills in financial products and accounting, investment analysis, modelling and operations, risk management and governance, business analytics and intelligence, and computational methods in problem solving.

DFI is the first polytechnic course that prepares students for exciting and rewarding careers in risk management and business analytics, which are professions in high demand. Technological advances and continued innovations in financial products and processes have also resulted in greater demand for computing and analytics skills to support financial decision-making. The global financial crisis and other recent events that eroded public confidence show the significance of risk management in today's evolving environment.

Students go through a specially designed programme that develops their competencies to meet the industry standards in risk management. DFI graduates distinguish themselves by being hands-on, with skills in industry-standard technologies such as Python and Tableau that are widely used in the industry today.

INDUSTRY MENTORSHIP

The distinction of DFI programme also lies in its industry projects and internships that will equip our students with relevant industry and life skills portfolios.

Apart from working alongside specially identified industry practitioners in their final year projects, students will also be engaged in a semester-long internship that will significantly enrich their learning experience and thus providing a springboard to their carreer and aspirations.

There will also be opportunities to work on projects with leading companies such as OCBC Bank, or organisations such as the Info-Communications Media Development Authority of Singapore.

VALUE-ADDED PROGRAMMES

In DFI, many value-added programmes await students. They will have the opportunity to obtain accreditation from the Institute of Chartered Accountant in England and Wales (ICAEW) certification.

Students will also be given opportunities to take on overseas immersion and work programmes to enrich learning experience.

ENRICHING LEARNING ENVIRONMENT

The hallmark of DFI has to be its bonded community that builds great sense of pride and camaraderie among the DFI students. The network comprises lecturers, peers, juniors, seniors and alumnus. Students can be connected fruitfully with others through various out-of-classroom activities such as bonding camps, Fintech bootcamp, Toastmasters programme, sport fiesta, community projects and networking events, which form an integrated part of the DFI programme.

DFI delivers its programme with an active learning approach. Theories and concepts are reinforced with projects, field trips and hands-on practicum using industry relevant tools. Our dedicated learning facility, Financial Informatics Lifelong Learning Space (FILLS) — will provide facilities to link finance theories/concepts and practical applications.

CAREER PROSPECTS

Promising career opportunities await the students as Singapore continues its positioning as an international financial centre and data analytics hub, thus driving the demand for professionals with relevant skills. They will have versatile career options in the areas of risk assessment and reporting, financial management, product control and compliance, accounting and banking, analytics and business intelligence, investment technology and operations, and project management.

FURTHER STUDIES

DFI graduates have many options for degree courses in view of its programme versatility. You can advance your studies in Business Administration, Finance, Accounting, Quantitative Finance, Business Analytics and Information Systems in both local and overseas universities.

DFI programme is also well-recognised by many professional bodies and you can pursue professional certifications in Institute of Banking and Finance (IBF) certification, Association of Chartered Certified Accountants (ACCA) and Institute of Chartered Accountants in England and Wales (ICAEW) certification.

COURSE MODULES

FULL-TIME	FIRST YEAR	HOURS
See common Year 1 core modules (page 74)		

FULL-TIME	SECOND YEAR	HOURS
Semester 1		
BA2153	Financal Market Products	60
BA0209	Financial & Management Accounting	60
BA2107	Business Analytics	60
BA2108	Database Management Systems	60
BA2218	Essential Programming (Python)	60
LC8003	Social Innovation Project	30
	Elective	60
Semester 2		
BA0400	Business Law	60
BA2211	Enterprise Risk Management & Modeling	60
BA2318	UIUX with web apps	90
BA2215	Predictive Analytics I	60
BA2312	Investment Operations	60
LC8004	General Education 3	30

FULL-TIME	THIRD YEAR	HOURS
Semester 1		
BA2105	Enterprise Information Systems	60
BA2311	Banking Operational Risk Management	60
BA2217	Predictive Analytics II	60
BA2317	Final Year Project	90
	Elective	60
Semester 2		
IC7005	Internship Programme (22 weeks)	330

Diploma in

Human Resource Management WITH Psychology

(DHRMP)

We Nurture PEOPLE Who Develop People.

SP is the first and leading polytechnic to offer a full-time Diploma in Human Resource Management with Psychology (DHRMP) since 2008. The course combines interesting and practical areas of human resource management (HRM) and psychology to develop you in future roles as Life Coach, Talent Developer, Work-Life Champion, Employee Advocate or Strategic HR Business Partner.

Emotional Intelligence and Positive Psychology concepts are also infused into SP's DHRMP curriculum enabling you to become a competent and holistic HR professional.

PRACTICAL TRAINING

Our innovative and unique Human Resource Learning Studio provides you with a conducive environment to acquire HR-related skills in communication, presentation, interviewing, counselling and negotiation. Students also receive hands-on training throughout this highly engaging course, culminating in their final-year client-based project. This learning journey is further emphasized through a 22-week internship with varied industry partners, school-wide leadership programmes and overseas immersion experiences.

STRATEGIC INDUSTRY ALLIANCES

Singapore Polytechnic has been appointed as "Sector Lead" for HR among the polytechnics and the Institute of Technical Education (ITE). This further strengthens our relationships with the HR community. Industry collaborations such as industry talks and field trips provide first-hand experience on HR and how HR teams function.

Our DHRMP students consistently win top awards in the Singapore HR Challenge, emerging as champions in 2016 and the last few years, including in 2011 when they won all awards in the Polytechnic Category (top three and Best Speaker Awards). They have also participated in key industry events such as the Singapore HR Congress, HR Summit and Asia Pacific Federation of Human Resource Management Conference.

DHRMP SCHOLARSHIPS

Prestigious DHRMP scholarships from leading organisations are also offered to students with academic excellence, CCA achievements and exemplary conduct.

CAREER PROSPECTS

Exciting job prospects await you in a wide spectrum of industries covering Career Coaching, Employee & Industrial Relations, HR Business Partnering, HR Technology, Learning and Development, Talent Management, Talent Sourcing and Acquisition and Total Rewards Management.

If you choose to start your HR career after graduation, you could further deepen your learning through on-the-job work experiences, SkillsFuture Earn and Learn Programme for HR, or SP's Specialist Diploma in Enhanced HR Skills. The Specialist Diploma is designed to support the Ministry of Manpower's direction in maximising people's potential, enhancing human capital development and raising the overall standards of the HR profession in Singapore.

SP's holistic approach to nurturing HR professionals ensures that our DHRMP students are work-ready, life-ready and world-ready.

"SP's DHRMP curriculum offers a good balance of HR, psychology and business knowledge which equip students with enterprise mind-set and readiness to embark on their career. The course helps students to deal with disruptive technologies which are affecting organization structure and workplace team dynamics. Besides equipping students with the essential knowledge in human resource management, SP's DHRMP course trains students with future ready skills such as emotional intelligence and positive psychology. The HR learning studio, overseas immersion and internship programmes are just some of the dynamic pedagogies that develop students with market ready HR competencies and people engagement skills."

Associate Professor Nigel Phang Yew Keong
Nanyang Business School
Nanyang Technological University

"I thoroughly enjoyed pursuing the DHRMP at SP. The lessons I learnt on measuring HR effectiveness or even how HR can be a strategic partner, talent developer and employee champion have prepared me for my role as a HR Manager. More importantly, other than technical HR competencies, I gained important life skills such as critical thinking, people management and collaboration. These have provided me with the ability to confront the ever-changing business environment and enabled me to become a better people person. The friendships that I have formed and the wonderful lecturers who were instrumental to my development is something that I am always thankful for. You will walk away with everything and more when you graduate from SP's DHRMP!"

Vanna Koh
Human Resource Manager, Housing & Development Board
SP DHRMP alumni, Pioneer Class of 2011

FURTHER STUDIES

SP's diploma is well-recognised by all local universities and many overseas universities. As SP's DHRMP graduate, you will receive generous advanced credit standing from reputable universities should you decide to further your studies. Our DHRMP graduates have gained admission into prestigious local and overseas universities in Business (HRM), Psychology, Sociology and Social Work programmes.

COURSE MODULES

FIRST YEAR
See common Year 1 core modules (page 74)

SECOND YEAR		HOURS
Semester 1		
BA0400	Business Law	60
BA0506	Employee and Industrial Relations	45
BA0814	Psychology in Counselling	45
BA0819	Learning and Talent Development	60
BA0820	Total Rewards Management	60
BA0821	Talent Sourcing and Acquisition	60
LC8003	Social Innovation Project	30
Semester 2		
BA0209	Financial & Management Accounting	60
BA0804	Performance Management	45
BA0806	HR Information System	45
BA0813	Employment Law	60
BA0815	Negotiation and Conflict Management	45
LC8004	General Education 3	30

THIRD YEAR		HOURS
Semester 1 or 2		
BA0824	HR Analytics	60
BA0808	Global HRM	60
BA0810	Psychology in Work Behaviour	45
BA0823	Integrated Human Resource Project	90
	Elective	45/60
Semester 1 or 2		
IC7006	Internship Programme	22 weeks

Diploma in

Tourism AND Resort Management

(DTRM)

Tourism continues to rise as one of the country's most vibrant and value-adding sectors. The Integrated Resorts coupled with new and attractive tourism offerings such as world-class hotels, convention facilities, entertainment shows, theme parks, luxury retail, fine dining and casino gaming have placed Singapore in the forefront of the world's preferred business and leisure destinations.

Employment as well as entrepreneurial opportunities have grown exponentially with tourism-related companies vying to attract and retain talents in the tourism industry. The Diploma in Tourism and Resort Management (DTRM) provides a winning combination of inculcating tourism and resort management skills and solid business acumen. Emotional Intelligence (EI) concepts are also infused into the DTRM curriculum underscoring EI's positive impact on students' academic, personal, and social lives.

The course also emphasises service excellence and broad business education which seeks to enhance business and management skills. In Year 3, students undergo a 22-week internship programme either locally or overseas. DTRM provides a well-rounded curriculum that prepares our graduates for careers in the dynamic hospitality, travel and tourism markets. The tourism industry promises tremendous prospects, success and varied fulfilling career pathways.

CAREER PROSPECTS

Graduates will have a competitive edge for a wide spectrum of jobs in the growing tourism and hospitality industries including the Meetings, Incentives, Conventions and Exhibitions (MICE) sector, travel and tour companies, resorts/hotels, cruise companies, airline companies, theme parks, tourist attractions including customer service-focused companies.

FURTHER STUDIES

The DTRM course is well-recognised by local and overseas universities. A number of recent DTRM graduates have been accepted into NUS, NTU, SIT and SMU.

COURSE MODULES

FULL-TIME	FIRST YEAR
See common Year 1 core modules (page 74)	

FULL-TIME	SECOND YEAR	HOURS
Semester 1		
BA0400	Business Law	60
BA0424	Travel & Tourism Practices	45
BA0419	Introduction to Hotel & Resort Operations	60
BA0420	Food & Beverage Management	60
BA2017	Business Analytics	60
LC8004	General Education 3	30
Semester 2		
BA0432	Hotel Sales & Marketing	60
BA0209	Financial & Management Accounting	60
BA0431	Front Office Operations	60
BA0421	Events Management	60
BA0422	Airline & Cruise Management	60
LC8003	Social Innovation Project	30

FULL-TIME	THIRD YEAR	HOURS
Semester 1 and Semester 2		
BA0416	Service Quality Management	45
BA0409	Resort Management	60
BA0418	Sponsorship Marketing in Tourism	60
BA0430	Attractions Operations	60
BA0176	Global Business Environment	60
	Elective Module*	
***Elective Modules (Choose ONE only)**		
BA0392	Business Negotiation Skills	45
MS1381	Mathematics for Business	60
BA2203	Principles of New Media Marketing	60
Semester 1 and Semester 2		
IC7007	Internship Programme	(22 weeks)
IH701Y/Z	Internship Programme	(44 weeks)

Diploma in

Engineering WITH Business

(DEB)

(Jointly offered by School of Electrical & Electronic Engineering, School of Mechanical & Aeronautical Engineering and SP Business School)

The Diploma in Engineering with Business (DEB) is an innovative multi-disciplinary course that provides students with cross-training in both engineering and business. The course leverages on the experience and expertise of three schools, namely School of Electrical & Electronic Engineering, School of Mechanical & Aeronautical Engineering and SP Business School to provide students with an exciting range of learning opportunities.

This diploma is specially designed for students who have a keen interest in mathematics, science and technology, but who may not wish to pursue a pure engineering course, thus offering greater choices and flexibility in their learning journey.

The course aims to:

- Provide students with fundamental engineering knowledge and understanding of technologies.
- Provide students with the knowledge and skills in interpreting technical drawings and understanding product-design issues and considerations.
- Provide students with fundamental business skills and the knowledge to link engineering with business.
- Equip students with life skills such as analytical skills, problem solving skills, communication skills and creative and critical thinking skills.
- Prepare students for lifelong learning by emphasising independent learning, teamwork, and character development.

To achieve the above aims, students will be given broad exposure to both engineering development and business practices through a variety of teaching and learning approaches, with one third of the time spent on learning and applying business concepts to engineering products and businesses. Engineering knowledge and business skills will be integrated over three project modules. In Year 3, students will be given the choice to select any two modules from a list of elective modules.

INTERNSHIPS

In the final year of study, all students will participate in a 22-week internship programme. Students will gain real-world work experience either locally or overseas as an intern at organisations or at our Technology Innovation Centres. The internship programme will expose students to invaluable authentic industrial learning experience in the engineering and business services sector.

ENGINEERING ACADEMY PROGRAMME

Outstanding DEB students are eligible for the Engineering Academy Programme in Year 2. Under this programme, students will go through an alternative curriculum designed to develop them to be engineers with creative confidence, comfortable with uncertainty, a growth mindset and self-driven learners.

ADVANCED MODULES

Students will be given the option of doing up to four advanced modules during their three-year course. These modules are designed to add greater depth of knowledge in key areas that will be useful for students who seek to go on to university studies. The advanced modules offered are:

- Advanced Mathematics I
- Advanced Mathematics II
- Advanced Mathematics III
- Further Mathematics
- Physics

ASSESSMENT

Assessment during each year of study will be by means of in-course assessments, practical tests and semester examinations.

SCHOLARSHIPS

Ample prestigious scholarships from SP are available for application by outstanding DEB students.

CAREER PROSPECTS

Graduates of this diploma will be versatile and be able to pursue rewarding careers in both engineering and business organisations. Given the cross-disciplinary training and with adequate working experience, graduates can aspire to become entrepreneurs.

FURTHER STUDIES

Graduates of this course have the flexibility to further their studies in business, various engineering (with business minor) or similar inter-disciplinary programmes in both local and overseas universities. Graduates with good results will be eligible for admission to the second year of the Electrical & Electronic Engineering (with business minor) course at the Nanyang Technological University (NTU) or gain about one years' worth of exemptions at the National University of Singapore (NUS). Graduates of this course have also been admitted to the Singapore University of Technology and Design (SUTD), Singapore Management University (SMU), Singapore Institute of Technology (SIT), University College London and University of Melbourne.

COURSE MODULES

FULL-TIME	FIRST YEAR	HOURS
BA0217	Fundamentals of Economics	60
BA0312	Principles of Marketing	60
ET0083	Structured Programming	60
ET0085	Computer Aided Design & Drafting (CADD)	30
ET1003	Digital Electronics I	60
ET1005	Principles of Electrical & Electronic Engineering I	60
ET1215	Engineering Design & Business Project I	60
ET1407	Introduction to Engineering	90
LC8001	General Education 1	30
LC8002	General Education 2	30
ME0101	Mechanics I	60
ME0401	Thermofluids I	60
MS4120	Basic Mathematics	60
MS4121	Engineering Mathematics I	60

FULL-TIME	SECOND YEAR	HOURS
BA0232	Business Planning for New Ventures	45
BA0313	Essentials of Financial Management	60
BA0314	Marketing Intelligence	60
BA9024	Professional Selling	30
ET0529	Mobile Applications Development	60
ET1006	Principles of Electrical & Electronic Engineering II	90
ET1216	Engineering Design & Business Project II	90
ET1217	Engineering Projects for Entrepreneurs	75
LC0355	Communicating for Project Effectiveness (Proposal)	30
LC8003	Social Innovation Project	30
LC8004	General Education 3	30
ME0104	Mechanical Engineering Systems	60
MS4205	Engineering Mathematics II (A)	60
MS4206	Engineering Mathematics II (B)	60

FULL-TIME	THIRD YEAR	HOURS
BA0354	Entrepreneurship & Small Business	60
ET0053	Circuit Theory & Analysis	75
IC4001	Internship Programme	968
LC0357	Communicating for Professional Effectiveness	30
ME2801	Industrial Engineering	60
And any two modules from the list of elective modules below:		
BA2203	Principles of New Media Marketing	60
BA2213	Investment Analysis	60
ET1115	Energy Management & Auditing	60
ET1205	Wireless Technology Applications	60
ME0205	Product Design & Realisation	60
ME2602	Instrumentation & Control	60

DIPLOMA IN **BUSINESS PRACTICE (ACCOUNTING)** (PART-TIME)

DIPLOMA IN **BUSINESS PRACTICE (BUSINESS MANAGEMENT)** (PART-TIME)

DIPLOMA IN **BUSINESS PRACTICE (HUMAN CAPITAL)** (PART-TIME)

DIPLOMA (CONVERSION) IN **MARKETING MANAGEMENT** (PART-TIME)

SPECIALIST DIPLOMA IN **DIGITAL MARKETING AND ANALYTICS** (PART-TIME)

SPECIALIST DIPLOMA IN **ENHANCED HUMAN RESOURCE SKILLS** (PART-TIME)

SPECIALIST DIPLOMA IN **PROFESSIONAL ACCOUNTING** (PART-TIME)

For more information on Part-Time Diploma Courses, you may refer to **www.pace.sp.edu.sg.**

FACULTY AND FACILITIES

The SP Business School is one of the largest business schools in Singapore with more than 100 full-time academic staff. We offer more than just a great curriculum. From surveys and feedback, our graduates endorse the SP Business School's quality teaching. Our lecturers are well qualified with practical experience in relevant industries. At SP Business School, your education will go far beyond books.

The learning process is dynamic and reflective of the 'real world' through the use of the following 'state-of-the-art' facilities:

ACCOUNTING COLLABORATION STUDIO

The work of an accounting professional involves making financial projections, fraud investigations, business risk management and many other business functional responsibilities.

What does it take to excel as an accounting professional? On top of strong technical skills, you will need excellent interpersonal and communication skills, emotional intelligence so as to forge strong networks with clients, as well as your bosses and peers.

How then can such skills be developed?

The Accounting Collaboration Studio is a special and vibrant learning space, dedicated to help students acquire these skills sets. In this well-designed studio, you can open up your mind to new experiences and new possibilities. The special recording facility in the studio allows one to review and assess his performance in simulated client engagements. The flexible room configuration is designed to support team-based learning in solving integrated accounting and business problems.

BUSINESS INNOVATION & DESIGN STUDIO

The first of its kind in Singapore, the Business Innovation & Design Studio is specially built to facilitate use of a designer's approach or design thinking to solve business problems and to seize new business opportunities. The dedicated learning facility supports the teaching and learning activities related to studio pedagogy and facilitates the effective assimilation of design thinking and business design skills.

The studio facilitates students' engagement in client-based projects to develop solutions for actual innovation challenges faced by the enterprise. As they go through the process, they apply the principles of design thinking.

The Business Innovation & Design Studio includes a mini lecture area; a user meeting area to support integrative thinking; an area for students to work in teams to generate ideas, elicit insights and do rapid prototyping. It is also a dedicated space for individual work and research.

The Business Innovation & Design Studio embodies SP's pioneer and premier status as a progressive polytechnic to incorporate design thinking into business education and will position SP as a progressive institution which will bring the best practices in the world to our students.

UOB KAY HIAN – SP DEALING CENTRE

Our UOB Kay Hian – SP Dealing Centre manifests our stand — SB offers our students an education that goes far beyond the traditional physical set-ups. The UOB Kay Hian – SP Dealing Centre is equipped with Thomson Reuters' financial information system which provides financial market rates, news and news headlines, financial reports and price charts. It is also supported by a dealing communication system of dealing phones and voice boxes. The UOB Kay Hian – SP Dealing Centre replicates a real-world trading experience and connects the classroom with the financial world. SB is the only polytechnic in Singapore with such a unique learning system.

The facility aims to train final-year Banking & Finance students in price making, as well as applying trading principles and trading position management. Students will experience the full dealing room environment in trading foreign exchange (currencies) as well as financial derivatives (futures and options). Students get a taste of life as a trader with the realism, competition and tension as the financial markets move.

ENTERPRISE HUB

Formerly known as the Entrepreneurship Resource & Ideas Centre (ERIC), SP Business School's Enterprise Hub was established in 2005 to meet the needs of a special cohort of students taking the course in entrepreneurship.

SP Business School's Enterprise Hub is an on-campus entrepreneurship teaching facility that offers students an office, meeting room, discussion and work spaces, inventory processing and storage areas. In addition to holding group discussions and presentations, students use the Enterprise Hub for meetings with their clients, customers and suppliers.

Enterprise Hub is part of an enterprise training ecosystem – including both on campus and off campus facilities – that authentically simulates real world business environments and operations. Our school uses a multi-pronged approach to cultivate a strong enterprising culture among students. This approach involves providing specialised hands-on experiential training programmes, offers and assists students in applying for seed funding, and collaborates with industry to create unique opportunities for student entrepreneurs that will give them a head start for their new ventures.

HOSPITALITY STUDIO

The Hospitality Studio is a learning space for students of the Diploma in Tourism and Resort Management (DTRM) course. This learning space provides practical training in Hotel Front Office reservations and Food & Beverage management.

For Hotel Front Office work, a mock Hotel Front Desk installed at the Hospitality Studio, allows students the opportunity to learn how to use the sophisticated 'Opera' computer reservations software. This software is widely used by most major hotels around the world. Students will engage in role plays as Hotel Front Office staff and guests. The Hospitality Studio also has a designated dining area where students are taught fine dining etiquette, table lay-out, proper serving tips and correct use of cutlery. Thus, students will have the practical knowledge and the mind-set of service excellence even before they step out for their 22-week internship programme.

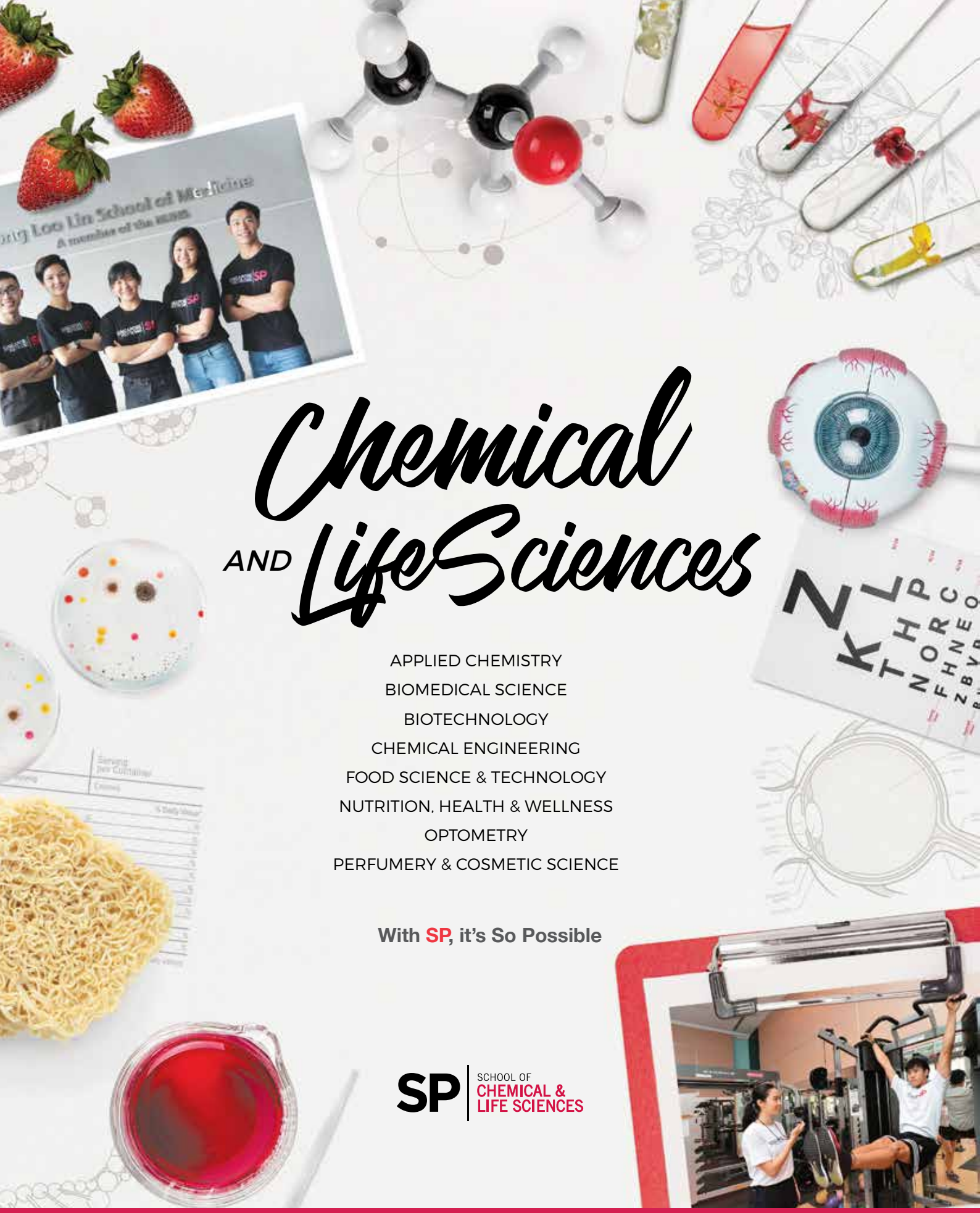
HUMAN RESOURCE LEARNING STUDIO (HRLS)

The Diploma in Human Resource Management with Psychology (DHRMP) course provides our students with good grounding in business and people skills. The Human Resource Learning Studio (HRLS) is equipped with a sophisticated audio-visual system and a coaching room for our students to have practical training in human resource management and psychology.

The HRLS' audio visual system — reinforced with one-way mirror and high resolution cameras for non-obtrusive capturing of students' verbal and non-verbal cues in their presentations, counselling or negotiations — enables tutors to provide feedback. The furniture of the HRLS is also specially designed to facilitate interactions among students effectively. Learning of modules such as 'Talent Sourcing and Acquisition', 'Psychology in Counselling', 'Negotiations and Conflict Management' and 'Integrated HR Project' are much facilitated in the HRLS.

FINANCIAL INFORMATICS LIFELONG LEARNING SPACE (FILLS)

FILLS is an active learning space with stimulating industry setting to empower learning in financial intelligence, risk management and data analytics. The state-of-the-art Bloomberg information services will provide real-time market information to transform the learning space into real-world classroom where industry issues and challenges are discussed in lessons and students explore solutions using the industry tools.


Chemical
AND LifeSciences
APPLIED CHEMISTRY
BIOMEDICAL SCIENCE
BIOTECHNOLOGY
CHEMICAL ENGINEERING
FOOD SCIENCE & TECHNOLOGY
NUTRITION, HEALTH & WELLNESS
OPTOMETRY
PERFUMERY & COSMETIC SCIENCE
With SP, it's So Possible
SP
SCHOOL OF
CHEMICAL &
LIFE SCIENCES

DIPLOMA COURSES

- Diploma in Applied Chemistry
  - Industrial Chemistry option
  - Materials Science option
  - Medicinal Chemistry Research option
  - Pharmaceutical Science option
- Diploma in Biomedical Science
  - Biomedical Research option
  - Cardiac Technology option
  - Medical Technology option
- Diploma in Biotechnology
- Diploma in Chemical Engineering
- Diploma in Food Science & Technology
- Diploma in Nutrition, Health & Wellness
- Diploma in Optometry
- Diploma in Perfumery & Cosmetic Science

ADVANCED DIPLOMA COURSES

- Advanced Diploma in Applied Food Science (Earn-and-Learn Programme)
- Advanced Diploma in Chemical Engineering (Earn-and-Learn Programme)

SPECIALIST DIPLOMA COURSES

- Specialist Diploma in Cosmetic Science
- Specialist Diploma in Formulation Science & Technology/Advanced Diploma in Specialty Chemicals
- Specialist Diploma in Microbiology
- Specialist Diploma in Nutrition & Exercise Science

OTHER COURSES OFFERED

- Diploma in Applied Science (Chemical Laboratory Technology (Earn-and-Learn Programme)
- Diploma in Applied Science (Industrial Chemistry & Life Sciences)

PRACTICAL TRAINING

The school has excellent laboratories and workshops equipped with state-of-the-art equipment and experimental set-ups to provide students with valuable hands-on experience. This is supplemented by industrial training, internship programmes or clinical attachment of various durations for different diploma courses. Our students can also gain international exposure through overseas internships.

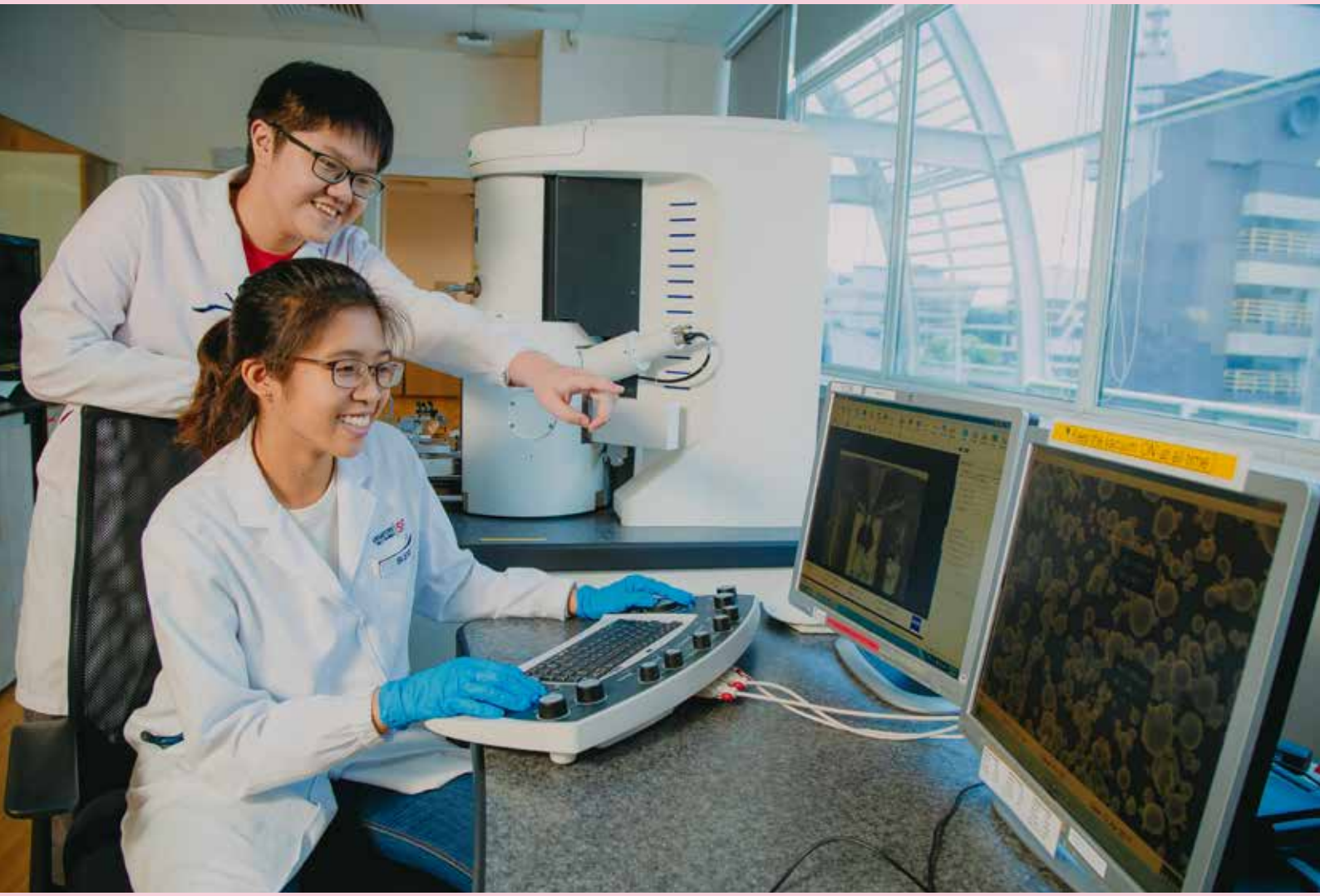
The chemical and life sciences industry is one of the largest and fastest growing segments in the Singapore economy. There is a significant demand for skilled workers in the various areas of industry, academia and research.

The School of Chemical & Life Sciences (CLS) is highly committed to train competent graduates for a wide range of career options and educational possibilities through its Diplomas, Advanced Diplomas, Specialist Diplomas, Certificates, short and tailor made courses. Up-to-date curricula and modern teaching facilities are integral to the CLS experience.

Diploma in

Applied Chemistry

(DAPC)



With strong support from the Economic Development Board (EDB) and good infrastructure, Singapore has, over the years, developed into a world-class chemical hub. Highly diversified, the chemical industry in Singapore comprises the oil refining, petrochemicals, specialty chemicals, and water technology sectors. There are currently more than 100 leading petroleum, petrochemical and specialty chemicals companies residing on Jurong Island alone.

Additionally, several local as well as global chemical companies are located within Singapore's industrial parks.

The biomedical industry, currently serving as the largest contributor to value-added manufacturing, is another key industry. It is therefore not surprising that it has been earmarked by the EDB as another key focus area. Thus far, over 30 global pharmaceutical and biotechnology companies have set up their international and regional headquarters in Singapore.

Singapore is also a global hub for materials creation and innovation. According to the EDB, the materials and chemical industry is poised for further growth as more world-scale chemical plants and R&D facilities come on stream. Developments across many sectors drive the demand for advanced and specialty materials. These include applications in the fields of polymers, nanomaterials, composites, elastomers, adhesives and coatings and clean energy technologies such as membrane technology and photovoltaic cells.

Asia's rapid urbanisation, changing demographics and the rise of the Asian middle-class have resulted in burgeoning demand for chemicals, pharmaceuticals, and materials, which have made these industries key drivers of the Singapore economy.

Many specialty chemicals, specialty materials and pharmaceutical companies are strengthening their presence in the region, leveraging on Singapore's leading position in logistics, intellectual property protection, access to global talent and R&D capabilities.

Clearly, the chemical, biomedical, and materials industries are high-growth sectors. To sustain their growth, these thriving industries require people who are specially trained in the chemical sciences.

A HEAD START

Offered only at SP, the Diploma in Applied Chemistry (DAPC) is a three-year, full-time programme tailored to meet the needs of the chemical, biomedical and materials industries. The course, which has a 22-week internship in Year 3, adopts a modular structure where you are given a strong foundation in fundamental and technological applications of chemistry, including biological science and materials science. There are four areas of specialisation: Industrial Chemistry, Materials Science, Medicinal Chemistry Research, and Pharmaceutical Science.

The Industrial Chemistry option offers a broad-based industry-focused curriculum to provide you with relevant skills and knowledge in chemistry to work across the chemical sectors, in particular, commercial laboratories, petrochemical, specialty chemicals, and pharmaceutical sectors.

The Materials Science option focuses on building a strong foundation in chemistry with an emphasis on materials science. You will learn to apply chemistry to develop advanced materials, like biomaterials, nanomaterials, green materials and composite materials to design innovative products for the rapidly evolving modern world.

The Medicinal Chemistry Research option will expose you to the latest developments in the design, delivery and discovery of pharmaceutical drugs. You will be inculcated with research methodology and critical thinking skills for your collaborative research internship under well-known researchers.

The Pharmaceutical Science option integrates chemistry with biological sciences to prepare you for a career in the pharmaceutical and biopharmaceutical sectors. You will learn specialised modules related to drug action on diseases, regulations, drug analyses, and pharmaceutical manufacturing.

We take pride in providing you with an extensive laboratory training and experiential learning in DAPC.

CAREER OPPORTUNITIES AND FURTHER EDUCATION

Graduates may find employment as laboratory analysts, application specialists, research assistants in the chemical, biomedical and materials industries. Graduates who choose to further their studies may be granted subject exemptions or direct entry into the second or third year of a degree programme.

COURSE MODULES

FULL-TIME	FIRST YEAR	HOURS
Common		
CP4122	Basic Biochemistry	60
CP4128	Environmental Studies	60
CP4135	Laboratory Skills in Analytical and Physical Chemistry	30
CP4136	Laboratory Skills in Inorganic and Organic Chemistry	30
CP4137	Physical Chemistry	45
CP4138	Analytical Chemistry	45
CP4139	Inorganic Chemistry	45
CP4140	Organic Chemistry	45
CP4147	Materials and its Applications	60
LC0254	Communicating for Personal and Team Effectiveness	30
LC0256	Communicating for Project Effectiveness (Report)	30
LC8001	General Education 1	30
LC8002	General Education 2	30
MS2125	Basic Mathematics	60
MS2128	Engineering Mathematics I	60

FULL-TIME	SECOND YEAR	HOURS
Common for Industrial Chemistry, Pharmaceutical Science, Medicinal Chemistry Research Options		
CP4009	Basic Instrumental Analysis	60
CP4036	Quality Assurance and Statistics	60
CP4086	Laboratory Management	60
CP4098	Forensic Chemistry	60
CP4121	Pharmaceutical Microbiology	60
CP4127	Organic Chemistry – Reaction Mechanism	60
CP4129	Environmental Systems and Management	60
CP4163	Pharmacology and Pharmaceutical Chemistry	60
LC0257	Communicating for Professional Effectiveness	30
LC8003	Social Innovation Project	30
LC8004	General Education 3	30
MS2237	Engineering Mathematics II	60

FULL-TIME	SECOND YEAR	HOURS
Materials Science Option		
CP4009	Basic Instrumental Analysis	60
CP4036	Quality Assurance and Statistics	60
CP4127	Organic Chemistry – Reaction Mechanism	60
CP4142	Polymeric Materials	60
CP4143	Metallic and Ceramic Materials	45
CP4144	Materials Characterisation and Failure Analysis	60
CP4146	Materials Processing	45
CP4148	Materials Processing Skills	30
CP4149	Materials Laboratory Skills	30
LC0257	Communicating for Professional Effectiveness	30
LC8003	Social Innovation Project	30
LC8004	General Education 3	30
MS2232	Mechanics of Materials	60
MS2237	Engineering Mathematics II	60

FULL-TIME	THIRD YEAR	HOURS
Industrial Chemistry Option		
CP4048	Advanced Instrumental and Lab Techniques	60
CP4103	Advanced Organic Chemistry	60
IC2002	Internship Programme	(22 weeks)
CP4159	Specialty Chemicals	45
CP4160	Petrochemicals and its Applications	45
CP4166	cGMP and Validation	45
CP4167	Advanced Physical Chemistry	60
Materials Science Option		
CP4086	Laboratory Management	60
IC2002	Internship Programme	(22 weeks)
CP4153	Materials Innovation & Design	60
CP4155	Coatings and Adhesives	45
CP4156	Elastomers	45
CP4164	Advanced Materials	60
CP4170	Capstone Project	60

FULL-TIME	THIRD YEAR	HOURS
Medicinal Chemistry Research Option		
CP4048	Advanced Instrumental and Lab Techniques	60
CP4103	Advanced Organic Chemistry	60
CP4141	Biomaterials	45
CP4158	Medicinal Chemistry	75
IC2002	Internship Programme	(22 weeks)
CP4167	Advanced Physical Chemistry	60
Pharmaceutical Science Option		
CP4048	Advanced Instrumental and Lab Techniques	60
CP4103	Advanced Organic Chemistry	60
CP4123	Pharmaceutical Manufacturing	45
IC2002	Internship Programme	(22 weeks)
CP4166	cGMP and Validation	45
CP4167	Advanced Physical Chemistry	60
CP4168	Bioprocess Engineering Principles	45

Diploma in

Biomedical Science

(DBS)

Singapore's goal to become Asia's premier Healthcare Hub and the significant growth of the Biomedical Science industry make the Diploma in Biomedical Science (DBS) a much sought-after qualification. This programme is recognised by the American Society for Clinical Pathology (ASCP) and the Institute of Biomedical Science (IBMS), UK.

Established in 1986, the three-year full-time diploma has a strong focus on medical testing, diagnosis, management and prevention of diseases, in line with the current direction of translational and clinical research. There are three areas of specialisation: Biomedical Research, Medical Technology, and Cardiac Technology.

The Medical Technology curriculum integrates biological sciences with clinical and research aspects of clinical laboratory sciences. Research and problem-solving skills are honed through project work in our laboratories, hospitals and/or national research institutions.

With the National Heart Centre Singapore and National University Heart Centre, Singapore, as our partners in training, our Cardiac Technology students engage face-to-face and work shoulder-to-shoulder with leading technologists and physicians in the field of cardiovascular and cardiac technologies.

Students in the Biomedical Research option are exposed to contemporary research issues in a curriculum designed to provide insights into research methodology and inculcate analytical thinking skills.

CAREER OPPORTUNITIES AND FURTHER EDUCATION

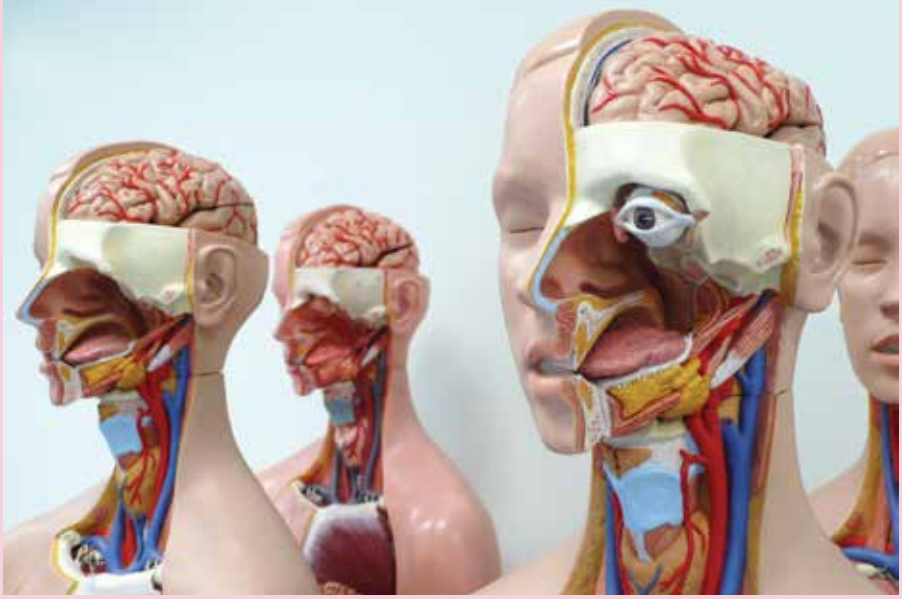
A challenging career awaits our graduates in research, medical and cardiac laboratories where they carry out diagnostic tests that aid in disease identification and often assist in saving lives. Current employment opportunities are excellent as the demand for clinical diagnostic testing continues to increase with both population growth and the development of new types of tests and treatment protocols. Employment opportunities for our DBS graduates can also be found in institutions conducting disease surveillance, forensics, regulatory testing, pharmaceutical or biomedical research and production.

Graduates can work as technical specialists or in sales and marketing within the medical diagnostics, pharmaceutical and healthcare sectors.

Well-regarded by local and overseas institutions of higher learning, many graduates have been granted direct entry into second or third year of degree programmes. These institutions have also sponsored many of our alumni in their MSc and/or PhD education. Beyond the traditional degree programmes in biomedical sciences, some of our graduates have gone into medicine, dentistry, veterinary science, pharmacy and physiotherapy.

COURSE MODULES

FULL-TIME	FIRST YEAR	HOURS
Stage 1A		
CP2301	Physiology and Biochemistry	75
CP2302	Microbiology	60
CP4001	Analytical and Physical Chemistry	60
LC0254	Communicating for Personal and Team Effectiveness	30
LC8001	General Education 1	30
MS2101	Mathematics A	60
Stage 1B		
CP2303	Immunology	60
CP2304	Cell and Molecular Genetics	60
CP4006	Inorganic and Organic Chemistry	75
LC0255	Communicating for Project Effectiveness	30
LC8002	General Education 2	30
MS2103	Mathematics B	75



FULL-TIME	SECOND YEAR	HOURS
Medical Technology Option		
Stage 2A		
CP2029	Basic Pathology	60
CP2081	Organic Chemistry – Reaction Mechanism	60
CP2305	Molecular Pathology Techniques	75
CP2306	Haematology	60
CP2308	Clinical Chemistry	60
LC8003	Social Innovation Project	30
Stage 2B		
CP202Y	Project	60
CP2034	Blood Banking	60
CP2035	Histological Techniques	45
CP2070	Clinical Instrumentation & Automation	45
CP2309	Applied Clinical Chemistry	60
CP2310	Medical Microbiology	60
LC8004	General Education 3	30

FULL-TIME	THIRD YEAR	HOURS
Medical Technology Option		
Stage 3A		
CP202Z	Project*	60
CP2033	Applied Immunology	60
CP2307	Applied Haematology	60
CP2311	Molecular Medical Microbiology	60
CP2313	Good Biosafety Practices	30
MS2231	Biostatistics	60
	Elective Module	30
Stage 3B		
CP2312	Advances in Laboratory Medicine	60
IC2007	Internship Programme	(22 weeks)
Elective Modules		
CP2052	Introductory Pharmacology	30
CP2117	Forensic Biology	30
CP2315	Biochemistry	30
CP9014	Physics	45

FULL-TIME	SECOND YEAR	HOURS
Biomedical Research Option		
Stage 2A		
CP2052	Introductory Pharmacology	30
CP2081	Organic Chemistry – Reaction Mechanism	60
CP2102	Fundamentals in Instrumental Analysis	45
CP2121	Clinical Research Management	30
CP2305	Molecular Pathology Techniques	75
CP2313	Good Biosafety Practices	30
LC8003	Social Innovation Project	30
Stage 2B		
CP2103	Clinical Biochemistry	60
CP2104	Haematology	60
CP2105	Medical Microbiology	60
CP2106	Advanced Immunology	60
CP2107	Integrated Pathology and Case Analysis	60
LC8004	General Education 3	30
MS2231	Biostatistics	60

FULL-TIME	THIRD YEAR	HOURS
Biomedical Research Option		
Stage 3A		
CP203Y	Final Year Project*	60
CP2110	Advanced Cell Biology	60
IG201Y	Internship Programme*	(17 weeks)
Stage 3B		
CP203Z	Final Year Project*	60
CP2109	Current Topics in Biomedical Research	60
IG201Z	Internship Programme*	(17 weeks)

FULL-TIME	SECOND YEAR	HOURS
Cardiac Technology Option		
Stage 2A		
CP2081	Organic Chemistry – Reaction Mechanism	60
CP2305	Molecular Pathology Techniques	75
CP2306	Haematology	60
CP2308	Clinical Chemistry	60
LC8003	Social Innovation Project	30
MS2231	Biostatistics	60
Stage 2B		
CP2029	Basic Pathology	60
CP2052	Introductory Pharmacology	30
CP2309	Applied Clinical Chemistry	60
CP2310	Medical Microbiology	60
CP2313	Good Biosafety Practices	30
LC8004	General Education 3	30

FULL-TIME	THIRD YEAR	HOURS
Cardiac Technology Option		
Stage 3A		
CP2316	Clinical Applications of Cardiac Drugs	30
CT0012	Applied Cardiac Anatomy and Physiology	60
CT0013	General Cardiology and Cardiac Disorders I	90
CT0015	Diagnostic and Interventional Cardiac Catheterisation	90
CT0021	ECG and Rhythm Disorders	90
CT002Y	Clinical Attachment*	(7 weeks)
Stage 3B		
CP2121	Clinical Research Management	30
CT0016	General Cardiology and Cardiac Disorders II	90
CT0017	Echocardiography	90
CT0018	Electrophysiology and Pacemakers	90
CT002Z	Clinical Attachment*	(7 weeks)

* Module covered in two semesters.

Diploma in

Biotechnology

(DBT)

Singapore's position as a Biohub with rapidly expanding biotechnology and biologics industries opens the door to many career possibilities. The life sciences sector in Singapore has a bright and exciting future based on its research and continued scientific excellence as well as business growth. Being a pioneer in offering biotechnology training to post-secondary school students, SP has been providing manpower and capacity training in this growth area for the global marketplace.

A HEAD START

The three-year Diploma in Biotechnology (DBT) curriculum provides a strong foundation in cell and molecular genetics, immunology, microbiology, physiology and biochemistry as well as a core programme in genomics and proteomics. Our diploma places strong emphasis on bioprocessing and biologics technology, cell and tissue engineering supplemented with necessary skills in biorisk and laboratory management.

This diversity of subjects covered provides an interdisciplinary knowledge suitable for laboratory-based careers within universities, government or private research institutions. Graduates can also work in industries related to translational science and medicine, life science, biomedicine, biopharmaceutical, commerce, food or education industries.

The diploma places a strong emphasis on hands-on training in our specialised laboratories and also field-based learning through a structured internship programme as well as group projects. Local and overseas internships provide students with an opportunity to work with prominent scientists and researchers in universities and research institutions.

CAREER OPPORTUNITIES AND FURTHER EDUCATION

Our DBT graduates are well placed for employment in all areas of the life sciences. Graduates will be able to excel in niche areas of research and development in applied sciences and translational medicines. Career opportunities are also available in companies involved in clinical trials, biotechnology, biologics, biopharmaceuticals, agriculture and healthcare.

The DBT course is well recognised by many local and overseas universities. Graduates can expect up to two years exemption for entry into undergraduate programmes in many overseas universities. The undergraduate programmes available include biological and life sciences, biomedicine, bioengineering, pharmacy, medicine, dentistry and teaching. Many of our alumni have been awarded scholarships to pursue undergraduate, postgraduate and post-doctoral education.

COURSE MODULES

FULL-TIME	FIRST YEAR	HOURS
Stage 1A		
CP2200	Bio-explore	30
CP2203	Physiology and Biochemistry	75
CP2204	Microbiology	60
CP4001	Analytical and Physical Chemistry	60
LC0254	Communicating for Personal & Team Effectiveness	30
MS2101	Mathematics A	60
LC8001	General Education 1	30
Stage 1B		
CP2201	Bio-conceptualise	30
CP2205	Immunology	60
CP2206	Cell and Molecular Genetics	60
CP4006	Inorganic and Organic Chemistry	75
LC0255	Communicating for Project Effectiveness	30
LC8002	General Education 2	30
MS2103	Mathematics B	75

FULL-TIME	SECOND YEAR	HOURS
Stage 2A		
CP2081	Organic Chemistry – Reaction Mechanism	60
CP220Y	Bio-discover*	60
CP2207	Molecular Techniques	60
CP2208	Flow Cytometry and Microscopy	60
CP2220	Proteomics	30
MS2231	Biostatistics	60
LC8003	Social Innovation Project	30
Stage 2B		
CP220Z	Bio-discover*	60
CP2209	Advanced Cell Biology	60
CP2210	Bioprocess and Biologics Technology	60
CP2211	Cell and Tissue Engineering	60
CP2221	Good Biosafety Practices	30
LC8004	General Education 3	30
1 Elective Module		

FULL-TIME	THIRD YEAR	HOURS
Stage 3A		
CP2213	Drug Discovery and Bioinformatics	45
CP2225	Current Good Manufacturing Practice	30
IG203Y	Internship Programme	(17 weeks)
1 Elective Module		
Stage 3B		
IG203Z	Internship Programme	(17 weeks)
Elective Modules		
CP2052	Introductory Pharmacology	30
CP2097	Cytogenetics	30
CP2116	Bio-entrepreneurship	30
CP2215	Bioremediation Technologies	30
CP2216	Agrobiotechnology	30
CP2117	Forensic Biology	30
CP2315	Biochemistry	30
CP9014	Physics	45

* Module covered in two semesters.

Diploma in

Chemical Engineering

(DCHE)

Singapore is a global and world-class chemical industrial hub with a wide range of companies specialising in the manufacture of products. These include petrochemicals, specialty chemicals, pharmaceuticals, biologics, semi-conductors, clean energy, water, food and healthcare products.

Chemical engineering is thus the discipline where sciences are combined with applied mathematics and engineering principles, taking laboratory ideas and turning them into value-added products in cost-effective, safe, cutting-edge and sustainable ways, suitable for industry.

GLOBAL RECOGNITION FOR QUALITY AND INNOVATIVE PROGRAMME

DCHE is the first diploma programme in Singapore to be fully accredited by the Institution of Chemical Engineers (IChemE), UK. The full IChemE accreditation signifies worldwide recognition by universities and industries on the rigor and quality of our programme.

DCHE is also the first chemical engineering diploma course in the world to adopt Conceive-Design-Implement-Operate (CDIO) education framework, which is in collaboration with top universities such as Massachusetts Institute of Technology, United States and Tsinghua University, China. Under this CDIO education framework, we transform traditionally boring and dry engineering education to an exciting and purposeful one that balances theoretical knowledge with realistic applications of chemical engineering principles.

Testifying to the quality of our programme, DCHE was the first chemical engineering programme to be awarded 'Excellence in Education and Training in Chemical Engineering' at the inaugural IChemE Singapore Innovation and Excellence Awards in 2010. DCHE subsequently clinched the same coveted award again in 2012 and 2015.

TRAINING OPPORTUNITIES

We ensure that all our students have ample industrial exposure via the enhanced internship programme where all students are sent out to relevant local/overseas chemical companies/ institutions for industrial attachments.

CAREER OPPORTUNITIES AND FURTHER EDUCATION

Singapore's position as a global chemicals hub has grown by housing many of the world's leading energy and chemical companies and has attracted investments in excess of S$35 billion. In addition, many of the world's top oil and gas, pharmaceutical, semi-conductors, clean energy, water, food and healthcare product companies have invested in manufacturing facilities in Singapore, as well as making Singapore their regional headquarters to drive their business expansion in Asia. [Source: Singapore Economic Development Board, 2016]

Graduates from DCHE will thus be able to find employment in the thriving local (and even overseas) Energy and Chemical industry.

Chemical engineering is one of the highest paid engineering professions. According to 2014 Employment and Monthly Gross Starting Salary of Polytechnic Graduates survey conducted by Singapore Ministry of Manpower, our graduates in full-time employment draw a mean monthly starting salary ranging from S$2,000 to S$2,400.

Also, more than half of our graduates are successfully accepted into well-established local and overseas universities every year. Many of our graduates are also offered module exemptions or direct entry into the second or third year of their university degree programmes.

Our graduates can also apply for either a two and a half year degree programme in chemical engineering that is offered by Technical University of Munich (TUM), Germany and Singapore Institute of Technology (SIT) or a two-year degree programme in chemical engineering that is offered by Newcastle University (NU), United Kingdom and SIT.

COURSE MODULES

FULL-TIME	FIRST YEAR	HOURS
Stage 1A		
CP4001	Analytical and Physical Chemistry	60
CP5090	Introduction to Chemical Engineering	75
CP5091	Materials for Design	60
CP5201	Lab and Process Skills 1	45
LC0256	Communicating for Project Effectiveness	30
LC8001	General Education 1	30
MS2125	Basic Mathematics	60
Stage 1B		
CP4006	Inorganic and Organic Chemistry	75
CP5092	Chemical Engineering Thermodynamics	60
CP5093	Heat Transfer and Equipment	60
CP5094	Fluid Flow and Equipment	60
CP5202	Lab and Process Skills 2	45
LC8002	General Education 2	30
MS2128	Engineering Mathematics I	60

FULL-TIME	SECOND YEAR	HOURS
Stage 2A		
CP5065	Introduction to Chemical Product Design	60
CP5095	Separation Processes & Simulation	75
CP5096	Process Instrumentation and Control	75
CP5203	Process Operation Skills 1	45
LC0257	Communicating for Professional Effectiveness	30
LC8003	Social Innovation Project	30
MS2237	Engineering Math II	60
Stage 2B		
CP5070	Chemical Product Design and Development	60
CP5097	Chemical Reaction Engineering	60
CP5098	Chemical Engineering Design Calculations	60
CP5099	Pharmaceutical Engineering	60
CP5204	Process Operation Skills 2	45
LC8004	Independent Study Project and Presentation	30
	Elective Module I	45

FULL-TIME	THIRD YEAR	HOURS
Stage 3A		
CP5033	Plant Safety and Loss Prevention	45
CP5062	Plant Design, Economics and Sustainable Development	75
CP5088	Capstone Project	120
CP5100	Biopharmaceutical Engineering	60
CP5101	Advanced Chemical Engineering Principles	45
	Elective Module II	45
Stage 3B		
IC2003	Internship Programme	22 weeks

FULL-TIME	THIRD YEAR	HOURS
Elective Modules		
CP4009	Basic Instrumental Analysis	60
CP4127	Organic Chemistry - Reaction Mechanism	60
CP5006	Environmental Engineering	60
CP5031	Membrane Science and Technology	60
CP5038	Industrial Waste Management	45
CP5071	Green Engineering and Alterative Energy	60
CP5082	Petroleum Refining and Enhancement	45
CP5083	Petrochemicals and Conversion Technologies	45
CP5084	Specialty Chemicals and Product Formulations	45
CP5087	Environmental Bioremediation Technologies	45
CP5089	Statistics	45

Diploma in

Food Science & Technology

(DFST)

The food industry is an important sector for Singapore. In Asia, the growing demand for high quality, nutritious and safe foods is driven mainly by a rapidly growing middle class. This places our food industry in a good position to innovate and market value-added products for these emerging markets.

Being the first polytechnic to provide training in food science and technology, SP has produced industry leaders in the field. With our modern, well-equipped food laboratories and strong links with the food industry, we are well positioned to prepare our students for challenging, diverse and rewarding careers in the industry. Product innovation has always been a priority in our curriculum and students are given plenty of opportunities to work on real-life, commercial projects. Some of these have translated into commercial products including the Pokka Lemon & Kalamansi drink, Two-Ply Noodles, XO Kaya, Yamie Rice, Rainbow Rice, as well as low Glycemic Index (GI) cupcakes, brownies and noodles.

Recognising SP's capabilities and facilities, the Food Innovation & Resource Centre (FIRC) was set up at SP in April 2007 under SPRING Singapore's Technology Innovation Programme initiative. This one-stop centre provides integrated consultancy, advisory and training sessions for food enterprises. FIRC provides enhanced internship, final-year projects, close linkages to food companies and job opportunities for our DFST graduates.

B.I.T.E. PROGRAMME

The Business design Infused with Technology Experience (BITE) programme is available to students in Year 3. It offers opportunities for students to work with industry partners through FIRC. It includes enhanced internship and final-year project components which challenge students' ability to apply food science and technology concepts in real-life, commercial projects. Students will be assigned to projects that expose them to design thinking, product development, scale up with pilot plant trial runs, packaging selection, shelf life studies, food analysis and sensory evaluation.

GLOBAL RECOGNITION FOR FOOD SCIENCE PROGRAMME

DFST is accredited by the International Union of Food Science & Technology (IUFoST). IUFoST promotes the advancement of global food science and technology through its education programmes, workshops, regional symposia and through working with the institutes/societies of food science and technology in many countries. Their accreditation is a testimony of DFST's ability to train food scientists and technologists to be world-ready.

CAREER OPPORTUNITIES

The food industry currently employs our graduates to work in product development, quality assurance, processing, sales and marketing in both the food manufacturing and food services sectors. Career opportunities are also open to our graduates in the chemical, pharmaceutical and packaging industries.

FURTHER EDUCATION

DFST graduates can apply for related degree programmes at local or overseas universities such as the Bachelor in Science – Food Science and Technology at the National University of Singapore; or the Degree in Biological Sciences with a Second Major in Food Science and Technology or the Degree in Chemical & Biomolecular Engineering with a Second Major in Food Science and Technology or the Degree in Chemistry & Biological Chemistry with a Second Major in Food Science and Technology at the Nanyang Technological University. They can also apply for admission to the Bachelor in Food Technology (Honours) programme or the Bachelor of Professional Studies in Culinary Arts Management offered by the Singapore Institute of Technology.

COURSE MODULES

FULL-TIME	FIRST YEAR	HOURS
Stage 1A		
CP6001	Introductory Food Science	75
CP6023	Physics	60
CP6046	Laboratory Skills for Inorganic and Organic Chemistry	30
CP6047	Organic Chemistry	45
CP6048	Inorganic Chemistry	45
LC0256	Communicating for Project Effectiveness	30
LC8002	General Education 2	30
MS2125	Basic Mathematics	60
Stage 1B		
CP6004	Food Chemistry	75
CP6043	Food Processing Principles	30
CP6049	Analytical Chemistry	45
CP6051	Physical Chemistry	45
CP6052	Laboratory Skills for Analytical and Physical Chemistry	30
CP6054	Basic Microbiology	60
LC8001	General Education 1	30
MS2128	Engineering Mathematics I	60

FULL-TIME	SECOND YEAR	HOURS
Stage 2A		
CP6006	Food Microbiology	60
CP6027	Food Ingredients	60
CP6032	Instrumental Analysis	60
CP6042	Fundamentals of Nutrition	60
CP6044	Quality Assurance and Statistics	60
CP6050	Food Preservation	60
LC8003	Social Innovation Project	30
Stage 2B		
CP6009	Food Product Design and Development	60
CP6024	Organic Chemistry – Reaction Mechanism	60
CP6031	Food Process Engineering	60
CP6033	Food Safety and Quality Management	60
CP6053	Research Methods and Communication	30
LC8004	General Education 3	30
MS2237	Engineering Mathematics II	60

FULL-TIME	THIRD YEAR	HOURS
Stage 3A		
CP601Y	Project	105
CP6034	Process Design and Implementation	60
CP6035	Food Packaging	60
CP6045	Food Trends and Regulations	30
LC0257	Communicating for Professional Effectiveness	30
Stage 3B		
CP601Z	Project	15
IS2006	Internship	

Diploma in

Nutrition, Health & Wellness

(DNHW)

The focus on nutrition and health science in this diploma prepares graduates to promote a healthier lifestyle through sound nutrition, active physical, mental and social living to reduce disease risks. Our graduates are well-poised to play a significant role in the government's push for citizens to adopt a healthy and better quality lifestyle. The entire population will certainly reap benefits as the key to overcoming escalating healthcare costs is to adopt a healthy lifestyle from young by eating and exercising right.

You may want to consider this course if you genuinely care for others' well-being and would like to help them take steps in being responsible for their own health. Our graduates will be well-prepared to promote and enhance better quality lifestyles and reduce disease risks through our comprehensive programme which integrates nutrition, health and wellness with a science-based curriculum.

PRACTICAL TRAINING

Students will receive practical training at the Nutrition, Health and Wellness Centre which houses the physical fitness and exercise physiology laboratories; food science and health food preparation/demonstration laboratories. These facilities, equipped with the latest equipment and experimental set-ups, will provide students with valuable hands-on experience. Students can also look forward to honing their skills further with an internship programme at relevant agencies and industries.

CAREER OPPORTUNITIES AND FURTHER EDUCATION

The future of the nutrition, health and wellness industry is bright. The EDB identified health and wellness as a business growth theme for Singapore. Market data from Euromonitor International reported that the sales of health and wellness products in Singapore reached $1,209 million in 2013 and is projected to reach $1,322 million by 2018; with greater growth in fortified/functional and naturally healthy products.

There are potential economic opportunities for Singapore as industries leverage on consumers' pursuit of health and wellness as a business growth driver. With an ageing population, Singapore requires good solutions and can act as a platform for industries to develop new ideas, products and services.

The 2012 Ministry of Health (MOH) Committee of Supply Speech on Healthcare 2020 states that Singapore is 'committed to improving the healthcare system' and 'this will always be work-in-progress because

we need to respond to the evolving needs of Singaporeans'. It is estimated that the healthcare professional workforce will increase by 50% by 2020. Hence, the industry's demand for trained nutrition, health and wellness technologists is very promising.

Graduates will find employment as nutrition, health and wellness technologists, assistant nutritionists, health promoters, lifestyle coaches, sales and marketing executives for health related industries, wellness coordinators, public health coordinators and healthy lifestyle promotion coordinators.

The diploma also prepares graduates for further studies in both local and overseas universities offering courses in nutrition and dietetics, medicine, physiotherapy, health promotion, sports science, education as well as in other disciplines. Graduates have been granted direct entry into second year of some degree programmes overseas. Many of our graduates have been awarded scholarships to study undergraduate programmes, such as dietetics, food and human nutrition, medical social work, physiotherapy, sports science and management, both locally and overseas.

COURSE MODULES

FULL-TIME	FIRST YEAR	HOURS
Stage 1A		
CP4001	Analytical and Physical Chemistry	60
CP7002	Nutrition	75
CP7003	Introduction to Health and Wellness	45
CP7004	Cell Biology, Microbiology and Immunology	60
LC0256	Communicating for Project Effectivenes1s (Report)	30
LC8002	General Education 2	30
MS2101	Mathematics A	60
Stage 1B		
CP4006	Inorganic and Organic Chemistry	75
CP6001	Introductory Food Science	75
CP7005	Anatomy and Physiology	60
CP7006	Fitness and Wellness throughout the Lifespan	60
LC8001	General Education 1	30
MS2103	Mathematics B	75

FULL-TIME	SECOND YEAR	HOURS
Stage 2A		
CP7011	Introduction to Biochemistry	60
CP7012	Applied Nutrition	60
CP7013	Diet and Nutrition Assessment	60
CP7018	Health and Ageing	60
CP7029	Basic Biomechanics	30
LC0257	Communicating for Professional Effectiveness	30
LC8003	Social Innovation Project	30
Stage 2B		
CP7009	Organic Chemistry – Reaction Mechanism	60
CP7014	Health Education and Health Promotion	60
CP7015	Exercise Physiology	60
CP7017	Nutrition and Disease	60
LC8004	General Education 3	30
MS2231	Biostatistics	60

FULL-TIME	THIRD YEAR	HOURS
Stage 3A		
CP701Y	Project*	60
CP7020	Clinical Nutrition	60
CP7022	Public Health and Community Nutrition	60
CP7023	Sports and Exercise Nutrition	60
CP7028	Physical Fitness Assessment and Exercise Prescription	75
CP7030	Research Methods	30
Stage 3B		
CP701Z	Project*	60
CP7027	Internship	(17 weeks)

* Module covered in two semesters.
Internship Programme is carried out in Year 3.

Diploma in

Optometry

(DOPT)

Optometry is part of the primary healthcare system and is the study of visual defects and functional disorders of the eye. The scope of Optometry includes managing refractive errors (such as myopia and presbyopia) through spectacle and contact lens correction, managing binocular vision problems such as lazy eyes, and detecting common eye diseases (such as cataract, diabetic retinopathy and glaucoma).

The Diploma in Optometry (DOPT) is a 3-year full-time course which aims to produce professionally competent optometrists serving as primary eye care health practitioners. The emphasis is on serving patients, and the clinical content of the course begins in the first week, increasing steadily through the three-year programme.

The Ministry of Health and employers have projected good demand for graduate optometrists due to the high prevalence of myopia in children and a rapidly ageing population. We were the first tertiary institution in Singapore to offer this course in 1994. As registered optometrists with the Optometrists and Opticians Board, our graduates have enjoyed excellent employment opportunities in the private and public sectors.

PRACTICAL TRAINING

The school has excellent clinical and laboratory facilities. The SP Optometry Centre, where members of the public come for eye examination, provides students with hands-on experience using state-of-the-art precision instruments and equipment. Our students start working with patients in Year 1 and continue with greater responsibilities in the subsequent years. Students will also be assigned to selected hospitals, contact lens and ophthalmic lens companies for attachments in order to widen their scope of experience in Optometry. In their final year, students will complete a semester-long internship at optical outlets to further enhance their Optometry skills.

Opportunities also exist for students to undertake overseas community projects and attachments to various Schools of Optometry and research institutions abroad.

CAREER OPPORTUNITIES AND FURTHER EDUCATION

There is currently a shortage of graduate optometrists in Singapore and there will continue to be a healthy demand for optometrists in the coming years. Graduates will be well suited for employment as optometrists in private practice or as salaried employees of eye-care related companies. Government hospitals and some statutory bodies also routinely employ optometrists. Alternatively, they may choose to pursue a career in research at institutions such as the Singapore Eye Research Institute (SERI) and the Defence Science Organisation (DSO).

COURSE MODULES

FULL-TIME	FIRST YEAR	HOURS
Stage 1A		
CP3047	Geometrical and Physical Optics	75
CP3055	Human Physiology and Cell Biology	60
CP3060	Clinical Optometry I	75
CP3071	Ophthalmic Optics	60
LC0255	Communicating for Project Effectiveness	30
LC8001	General Education 1	30
MS2101	Mathematics A	60
Stage 1B		
CP3035	Physiological and Visual Optics	75
CP3048	Ocular Anatomy and Physiology	90
CP3061	Clinical Optometry II	45
CP3072	Ophthalmic Dispensing	75
LC8002	General Education 2	30
MS2103	Mathematics B	75

FULL-TIME	SECOND YEAR	HOURS
Stage 2A		
CP3056	Ocular Disease I	60
CP3062	Clinical Optometry III	75
CP3066	Contact Lenses	90
CP3067	Binocular Vision and Paediatric Optometry I	60
CP4001	Analytical and Physical Chemistry	60
LC8003	Social Innovation Project	30
Stage 2B		
CP3013	Ocular Pharmacology	30
CP3022	Clinical Practice I	90
CP3052	Contact Lens Practice I	75
CP3057	Ocular Disease II	60
CP3069	Research Methods in Optometry	30
CP4006	Inorganic and Organic Chemistry	75
LC8004	General Education 3	30

FULL-TIME	THIRD YEAR	HOURS
Stage 3A		
BA9014	Business Management for Optometry Practice	60
CP3024	Clinical Practice II	90
CP3053	Contact Lens Practice II	75
CP3064	Low Vision and Community Health Optometry	45
CP3068	Binocular Vision and Paediatric Optometry II	45
CP3070	Project	60
Stage 3B		
IB2004	Internship Programme	(17 weeks)

Diploma in

Perfumery & Cosmetic Science

(DPCS)

The Diploma in Perfumery & Cosmetic Science (DPCS) offers training in Chemistry with applications in Perfumery and Cosmetic Science. The lucrative chemical and consumer care sectors are gaining a strong presence in Singapore as evident by the sizeable investments made here, which exceed S$30 billion. One huge investment project is the opening of a mega innovation centre in Biopolis by Procter and Gamble which is well-known for its top-selling SK-II brand. The fragrance and flavours giant, Givaudan also has a strong footing in Singapore with the recent announcement of its largest Asia Pacific Fragrance Creative Centre here alongside the launch of its prestigious Perfumery School.

As the optimism for the consumer care industry all over the world continues to grow, it is timely to develop a skilled pool of talent, particularly in Asia. Being the only local institute of higher learning that offers a formal training in this discipline, the course aims to equip the individual with the right skills to serve this practical and recession-resistant industry. To help Singapore become the regional beauty hub, we welcome passionate individuals to join us and make a difference in shaping the future landscape of this sector.

APPLIED TRAINING

DPCS is the only local diploma programme that offers comprehensive training in chemistry, perfumery and cosmetic science as well as business and marketing skills for the respective chemical and consumer care sectors. This programme not only prepares its graduates to serve the chemical sectors encompassing the fields of fragrance, personal care and cosmetics, it also prepares them for further studies in universities.

Students will be inculcated with a strong foundation in chemistry before acquiring advanced knowledge and valuable practical skills in the various areas of scientific applications. Theoretical training is further reinforced by engaging practical sessions in the state-of-the-art Perfumery & Cosmetic Science Centre (PCSC). The practical sessions include olfactive exercises, creation of perfumes and cosmetic products, synthesis of delightful- smelling organic specimens and isolation of essential oils.

Our students are also given exciting opportunities by our industry collaborators to exhibit their talents in creating novel perfumes or toiletries for their final-year projects, some of which have been developed into commercialised room scents and perfumes. Numerous significant milestones have been achieved based on our students' prized creations. Apart from the Romancing Singapore series of perfumes, a nature-scented air freshener was launched at Expo 2012 in Yeosu, Korea.

This was a collaboration with the Ministry of the Environment and Water Resources of Singapore (MEWR) and Pico Art International Pte Ltd to elicit the theme 'Nature conservation goes hand in hand with urbanisation' at the Singapore Pavilion. The most recent students' creation is an ozonic perfume named Splash, made in commemoration with SP's 60th anniversary.

Our attachment programme with the relevant industries plays a crucial role in training our students in a real-world context. Collaborations with reputable local/overseas universities, as well as renowned flavour and fragrance houses, cosmetic companies and other chemical companies have been established.

CAREER OPPORTUNITIES AND FURTHER EDUCATION

Employment opportunities are excellent for DPCS graduates. Potential employers in the chemical industry range from multinational corporations to small and medium enterprises. Being the only tertiary institution that offers training in the perfumery, personal care and cosmetic science disciplines, our graduates hold the advantage when seeking employment in these sectors. Moreover, their knowledge and skills acquired enable them the versatility to explore careers in these areas within the chemical and consumer care sectors. Graduates may also choose to pursue a Bachelor's degree or higher in Chemistry or related subjects in both local and overseas universities. They can also explore overseas educational institutions for further studies in the more specialised areas of Perfumery or Cosmetic Science.

COURSE MODULES

FULL-TIME	FIRST YEAR	HOURS
Stage 1A		
CP4503	Cell Biology	60
CP4507	Introduction to Fragrances and Flavours	60
CP4528	Laboratory Skills in Inorganic and Organic Chemistry	30
CP4531	Inorganic Chemistry	45
CP4532	Organic Chemistry	45
LC0256	Communicating for Project (Report) Effectiveness	30
LC8002	General Education 2	30
MS2125	Basic Mathematics	60
Stage 1B		
CP4511	Skin Care Raw Materials and Products	60
CP4515	Hair Care Raw Materials and Products	60
CP4527	Laboratory Skills in Analytical and Physical Chemistry	30
CP4529	Analytical Chemistry	45
CP4530	Physical Chemistry	45
LC0256	Communicating for Project (Report) Effectiveness	30
LC8001	General Education 1	30
MS2128	Engineering Mathematics I	60

FULL-TIME	SECOND YEAR	HOURS
Stage 2A		
CP4508	Basic Instrumental Analysis	60
CP4509	Colloid Chemistry	60
CP4510	Organic Chemistry – Reaction Mechanism	60
CP4513	Quality Assurance and Statistics	60
CP4522	Formulation Science of Cosmetics	60
LC0257	Communicating for Professional Effectiveness	30
LC8003	Social Innovation Project	30
Stage 2B		
BA0312	Principles of Marketing	60
CP4514	Fragrance and Flavour Chemistry	60
CP4538	Product Innovation and Management	75
CP4539	Advanced Physical Chemistry	60
LC8004	General Education 3	30
MS2237	Engineering Mathematics II	60

FULL-TIME	THIRD YEAR	HOURS
FEEL Programme		
Stage 3A		
CP451Y	Project*	60
CP4518	The Art of Perfumery	60
CP4537	Safety Assessment, GMP and Cosmetic Regulations	60
IA2005	Internship Programme	
Stage 3B		
BA0348	Consumer Psychology	60
CP451Z	Project*	60
CP4516	Advanced Instrumental and Lab Techniques	60
CP4517	Advanced Organic Chemistry	60
CP4521	Laboratory Management	60

FULL-TIME	THIRD YEAR	HOURS
SENSE Programme		
Stage 3A		
CP4518	The Art of Perfumery	60
CP4537	Safety Assessment, GMP and Cosmetic Regulations	60
CP453Y	Extended Internship Programme*	
Stage 3B		
CP4521	Laboratory Management	60
CP453Z	Extended Internship Programme*	

* Module covered in two semesters.

CONTINUING EDUCATION

From time to time, the school also conducts short, tailored and WSQ courses for personnel from industry in disciplines related to the school's expertise. Available courses include optometry, process operations, plastics materials and processes, injection moulding, materials characterisation, process automation, electroplating, fermentation, water and sewage treatment, water quality and ecology, fragrance creation, cosmetic formulation, Good Manufacturing Practice (GMP), Good Distribution Practice (GDP), workplace health and safety, chemical safety, forensic chemistry, food innovation and lifestyle, biosafety, clinical chemistry, medical microbiology, histology, phlebotomy plant and animal tissue culture. Details of these courses are available online under Continuing Education in SP webpage.

ADVANCED DIPLOMA IN APPLIED FOOD SCIENCE (EARN-AND-LEARN PROGRAMME)

For more information on Earn-and-Learn Programmes, you may refer to **www.pace.sp.edu.sg**

ADVANCED DIPLOMA IN CHEMICAL ENGINEERING (EARN-AND-LEARN PROGRAMME)

For more information on Earn-and-Learn Programmes, you may refer to **www.pace.sp.edu.sg**

DIPLOMA IN APPLIED SCIENCE (CHEMICAL LABORATORY TECHNOLOGY) (EARN-AND-LEARN PROGRAMME)

For more information on Earn-and-Learn Programmes, you may refer to **www.pace.sp.edu.sg**

DIPLOMA IN APPLIED SCIENCE (INDUSTRIAL CHEMISTRY & LIFE SCIENCES) (PART-TIME)

For more information on Part-time Diploma Courses, you may refer to **www.pace.sp.edu.sg**

SPECIALIST DIPLOMA IN COSMETIC SCIENCE (PART-TIME)

For more information on Part-time Diploma Courses, you may refer to **www.pace.sp.edu.sg**

SPECIALIST DIPLOMA IN FORMULATION SCIENCE & TECHNOLOGY (PART-TIME) / ADVANCED DIPLOMA IN SPECIALTY CHEMICALS (PART-TIME)

For more information on Earn-and-Learn Programmes, you may refer to **www.pace.sp.edu.sg**

SPECIALIST DIPLOMA IN MICROBIOLOGY (PART-TIME)

For more information on Part-time Diploma Courses, you may refer to **www.pace.sp.edu.sg**

SPECIALIST DIPLOMA IN NUTRITION & EXERCISE SCIENCE (PART-TIME)

For more information on Earn-and-Learn Programmes, you may refer to **www.pace.sp.edu.sg**

CLS LABORATORIES/ WORKSHOPS/ CENTRES

The **Advanced Instrumental Analysis Laboratory** provides students with practical experience in several instrumental techniques, e.g. UV-visible and atomic absorption spectrophotometries, ICP-OES, fluorimetry, potentiometer, liquid and gas chromatographies, LC-MS and GC-MS.

The **Analytical & Forensic Chemistry Laboratory** provides students with laboratory skills in forensic chemistry. The laboratory is equipped with HPLC, FTIR, Electrophoresis, IR and GC.

The **Applied Chemistry Laboratory** is equipped with basic instruments and equipment suitable for teaching basic chemistry, physical chemistry and analytical chemistry. Quantitative and qualitative analyses and titrations are carried out in this laboratory.

The **Biologics Corridor** consists of a series of laboratories that include a clean room for professional training and hands-on practice for bioprocessing as well as core life sciences techniques. The laboratories are equipped with an extensive and state-of-the-art line-up of bioprocessing equipment (stainless steel and single-use bioreactors, chromatography systems, bioanalysers) as well as core life science equipment (confocal microscope, inverted fluorescence microscope, flow cytometry, gel documentation systems, etc) to support research and development.

The **Biotransformation Laboratory** is a place where various types of food fermentation processes are explored and studied with the aid of state-of-the-art equipment. The laboratory also houses an array of lactic acid bacteria and yeast which act as work horses for various food fermentation processes. Current and future research works carried out in the laboratory include the bioconversion of food manufacturing by-products into utilisable food ingredients and products. Other upcoming research works include the study of microbe-microbe interaction for the optimisation of food fermentation processes and the bio-formation of aroma compounds by yeast species.

The **Dough and Roll Studio** provides facilities for food product development and sensory evaluation, using the experimental kitchen with bakery capability and sensory evaluation booths.

The **Engineering Applications Laboratory** houses a wide range of process equipment for students to learn basic chemical engineering principles. The equipment includes thermodynamics teaching kits, a grinding and sieving system, a material balance teaching unit, a calorimetry system and analytical equipment.

The **Food Analysis Laboratory** provides facilities for students to gain experience in the fundamentals of food chemistry and analysis. The laboratory is equipped with a Kjeldahl digestor, fat analysers and water activity meter. Equipment include high performance liquid chromatograph, inductively coupled plasma emission spectrometer, gas chromatograph, bomb calorimeter and spectrophotometers.

The **Food Creation Laboratory** has facilities for development, evaluation and application of food ingredients and flavours such as beverages, confectioneries, culinary and dairy products. Equipment include texture analyser, rapid viscosity analyser for starch and dough analysis, water activity meter, colorimeter, viscometer and vapour pressure osmometer.

The **Food Processing Laboratory** houses a wide range of food processing and packaging equipment including state-of-the-art pilot plant facilities. These include spray dryer, fluidised-bed dryer, encapsulator, rotary evaporator, pasteuriser and steriliser, falling film evaporator, homogeniser, water vapour transmission rate detector, modified atmosphere packaging machine and headspace analyser. Students will gain hands-on training experience in food processing, preservation and packaging.

The **General Chemistry Laboratory** is equipped with basic instruments and equipment suitable for teaching the basic principles of organic chemistry. Simple organic synthesis and functional group determinations are performed in this laboratory.

The **Green Chemistry Laboratory** has a range of facilities to measure levels of pollutants in air and water. It houses a full-range of equipment for testing and characterisation of petroleum products, e.g. gas chromatograph, viscometers, aniline point apparatus.

The **Industrial Unit Operations Laboratory** houses a wide range of well-instrumented pilot plants to provide hands-on experience in equipment start-up, shutdown and operation of separation processes. A real life operation environment is created with the pilot-size multistage bubble-cap distillation pilot plant, equipped with Distributed Control System in the control room. Other pilot plants include the climbing film evaporator, various heat exchangers (shell-and-tube, double-pipe, plate), crystalliser, drying unit, pulsed liquid-liquid extraction unit etc. The laboratory also houses various pump pilot plant, real size training pump, valves as well as liquid mixing pilot plant. Students get to study the operating characteristics and power requirement for the different pumps and the effect of different impeller designs on mixing efficiency as well as gain good understanding on the anatomy of pumps and valves. The pilot plants are designed to support the integrated curriculum which fuses engineering concepts, experiences, real-life knowledge and problem-solving skills to make an effective learning environment for students.

The **Materials Performance Centre** houses four specially designed state-of-the-art laboratories to provide authentic and skill based training in applied materials science. The Materials Innovation & Design Room provides a conducive space for students to brainstorm, conceptualise and design innovative materials. It has 3D printers and other tools to support research and development. The Materials Formulation Laboratory has a range of facilities for the formulation of coatings, elastomers and other polymeric materials. The Materials Prototyping Laboratory houses a wide range of equipment for the processing of polymers and elastomers e.g. injection moulding, multi-layer film extrusion, blown-film extrusion, twin-screw compounding, compression moulding. The Materials Diagnostic Laboratory is well equipped for testing and characterisation of materials using e.g. tensile tester, differential scanning calorimeter, Fourier transform infrared (FTIR) spectroscope, scanning electron microscope, light scattering nanoparticle measurement.

The **Medical Technology Suite** is divided into several specialised laboratories, providing support to practical and research of various disciplines in medical laboratory science and biomedical research including clinical chemistry, haematology, histopathology, immunology and molecular diagnostics. Equipment include genetic analyser, droplet digital PCR system, flow cytometer, conventional and real-time thermal cyclers, capillary and gel electrophoresis systems, microplate reader, automated analyser for whole blood and serum, FTIR, double-beam spectrophotometer, tissue processor, microtome, cryocut, bright field (single and multi-headed) and fluorescence microscopes.

The **Microbiology Laboratory** provides facilities to conduct practical and research in microbiology, genomics and proteomics. The laboratory is equipped to carry out microscopic examination of cells, sterility testing, microbial enumeration, and microbial identification by rapid biochemical technique and molecular methods like polymerase chain reaction and protein analysis.

Equipment include biosafety cabinets, static and shaker incubators, colony counters, real-time thermal cyclers, DNA and protein gel electrophoresis sets with gel documentation systems and MALDI-TOF Mass Spectrometer.

The **Nutrition, Health & Wellness Centre** supports hands-on teaching for the DNHW course. It has a wide range of equipment which will be housed in the Exercise Physiology, Physical Fitness and the Health Food Preparation/Demonstration Laboratories within the Centre.

The **Organic Chemistry Laboratory** services the practical sessions carried out by Year 2 students. Practical work on organic synthesis and reaction mechanism is carried out in this laboratory.

The **Perfumery & Cosmetic Science Centre** provides facilities for the development and application of fragrances and personal care products in the chemical, cosmetics and toiletries industries. It is equipped with rheometers, viscometers, homogenisers, microfluidiser, microscopes, tensile instrument, UV-vis spectrophotometer, skin investigation systems, sun protection diagnostic instrument, multidimensional GC-MS, centrifuge, penetrometer, humidity chamber, density and refractive index measuring instrument, etc.

The **Pharmaceutical Chemistry Laboratory** provides facilities for drug synthesis and analysis of active pharmaceutical ingredients and finished dosage forms. Instruments available include SOTAX AT7 dissolution testing unit, Pharmatest machine and Silverstone mixer.

The **Pharmaceutical Technology Centre** houses a range of primary and secondary pharmaceutical manufacturing pilot plants to provide hands-on experience on the production of therapeutic drugs from raw materials to the final products as well as clean-in-place (CIP) concepts. These equipment reflect the typical process units used in the manufacture of pharmaceutical products via organic synthesis.

The **Process Automation & Control Laboratory** houses process instrumentation and control pilot plants and portable fuel cell units. Students get to perform process control using a control system that interfaces to a level control column. They are also exposed to control strategies for pilot plant operations, such as feedback control, ratio control as well as controller tuning. Besides, it is equipped with several membrane-based pilot plants including a reverse osmosis unit and a nano filtration unit. The laboratory is also home to many final-year student projects, as it is equipped with prototyping facilities.

The **Process ++ Laboratory** hosts reaction engineering and thermodynamics practicals with various chemical reactor pilot plants such as the jacketed chemical reactor featuring PC-based control system, continuous stirred tank reactor (CSTR), a batch reactor and a plug flow tubular reactor (PFTR).

SP Optometry Centre serves as a clinical training facility for Optometry students. There are 15 fully-equipped consulting and special examination rooms. The facility offers colour vision and stereoscopic tests and is equipped with tonometers and advanced ocular diagnostic instruments. Different types of contact lens trial sets and solutions are available for student use in clinical work. The centre is open to the public for vision assessments and eye examinations.

The **Vision Science Laboratory** incorporates state-of-the-art training facilities for the DOPT course which provides a fresh approach to clinical teaching. It includes the Clinical Optometry Learning Centre and the Ophthalmic Dispensing Learning Centre.

Communication, Arts AND Social Sciences

APPLIED DRAMA & PSYCHOLOGY
CREATIVE WRITING FOR TV & NEW MEDIA
MEDIA & COMMUNICATION

With SP, it's So Possible

SP | SCHOOL OF COMMUNICATION, ARTS & SOCIAL SCIENCES

Connect. Transform. Inspire. Be the story maker who creates stories that are simply powerful.

CASS@SP: Take your story to a higher level.

ABOUT US

A keen eye on society's changing needs gives us a leading edge. Here at the School of Communication, Arts & Social Sciences (CASS), we equip you to take on the 21st century — a world that is volatile and complex yet also constantly being reinvented with fresh possibilities.

In this dynamic environment, we believe that individuals trained to harness the power of their imagination can make their mark and transform their workplaces, communities and even the world.

Learn from the experts. CASS, like the rest of SP, has embarked on an exciting reimagining of education. As experts in media and communication, creative writing as well as drama and psychology, we know our industries and we're here to help you find your voice; translate that good idea into a brilliant communication campaign, eloquent drama, documentary, film or web-based project; and change the way people think — forever.

Experience the industry. Our innovative learning spaces offer an intensely practical education that extends beyond the classroom, to real projects for clients and hands-on exposure to the latest industry practices.

Design Thinking will equip you with a deep understanding of consumers and the ability to generate life-changing solutions.

You'll also be having fun, building friendships and expressing yourself in co-curricular activities and student-led initiatives. In the stimulating setting that is uniquely CASS, you'll be creating stories that you can be proud of.

Soar with your story. Wherever you look, CASS alumni are soaring off into further education or fulfilling careers in integrated communication, public relations, advertising, web publishing, broadcasting, journalism, filmmaking, arts education, community development and social services.

THREE DIPLOMAS

CASS is proud to offer three diplomas that take story making to new dimensions to produce first-rate communicators.

Our **Diploma in Applied Drama and Psychology (DADP)** is Asia's first and only interdisciplinary diploma to combine applied drama and psychology.

Our **Diploma in Creative Writing for TV and New Media (DTVM)** is Singapore's first and only creative writing diploma that caters to content creation for the television and new media markets.

Our **Diploma in Media and Communication (DMC)** is the first course of its kind to provide training in a facility modelled on a real-life integrated communication agency.

** All full-time diploma students are required to take two compulsory Education and Career Guidance Modules in SP. Students will take SP101A: Education and Career Guidance 1 – Personal Development (15 hours) in their first year. In their second or third year, students will take SP201A: Education and Career Guidance 2 – Career Development (30 hours).*

** All students are required to take one compulsory Sports for Life (SFL) module for one semester in their first year in SP. In their second and third year, students may sign up for SFL module as an elective.*

Diploma in

Applied Drama AND Psychology

(DADP)

Do you want to help others share their stories? Who are the people you would like to help? How can their stories change lives or influence communities for the better?

Applied drama informs and challenges us to look at the world we live in with fresh eyes. Students in our Diploma in Applied Drama and Psychology (DADP) course use drama with different communities for education, communication, intervention and for effecting change. They also learn about how people think and behave.

At CASS, authentic learning means extending the boundaries of the classroom. Connect with different communities through industry-based assessments. Design programmes to meet the specific needs of participants — from children and youths to the elderly.

WITH THIS COURSE, YOU WILL:

- Draw on the expertise of leading dramatists through our Artist-in-Residence scheme and master classes. Learn from international practitioners in drama/social service/psychology fields.
- Work with communities from a wide range of settings, such as schools and social service agencies. Intern with local drama companies, schools, government agencies and social/community services.
- Bring different stories to life in BlackBox, our drama space with unlimited potential to transform itself, its players and its audience.

Join us — combine your dramatic flair with the heart to make a difference in society.

YOUR FUTURE

Lift off into a successful career. Your skills in combining drama techniques with an understanding of the human psyche to reach communities will put you in high demand. We open the door to a variety of rewarding careers in the education, government and community sectors:

- Drama Educator
- Drama Facilitator
- Education and Outreach Officer
- Programme Officer
- Social Work Assistant
- Community Worker

Upon graduation, you may pursue a degree in Drama, Theatre Studies, Applied Drama, Psychology or Arts and Social Sciences.

DADP graduates have been accepted into degree programmes at local and foreign universities. Some of these universities grant generous exemptions and advanced standing to our graduates.

COURSE MODULES

FULL-TIME	FIRST YEAR	HOURS
SC5008	Introduction to Drama and Performance	90
SC5015	Understanding Research and Ethics	45
SC5018	Social Psychology	60
SC5023	Industry Immersion	30
SC5041	Drama Conventions	45
SC5061	Devised Drama	90
SC506Y/Z	Introduction to Applied Drama	90
SC5062	Introduction to Psychology	90
SC536Y/Z	Lifespan Psychology	90
LC8001	General Education 1	30
LC8002	General Education 2	30

FULL-TIME	SECOND YEAR	HOURS
SC5017	Drama-in-Education	60
SC5024	Theatre-in-Education	60
SC5029	Process Drama	60
SC5030	Community Psychology	60
SC5031	Psychology-in-Education	60
SC5034	Forum Theatre	75
SC5035	Methods of Inquiry	60
LC8003	Social Innovation Project	30
LC8004	General Education 3	30
***Choose 2 out of the 3 electives.**		
SC5036	Children – Story Drama & Developmental Issues in Childhood	90
SC5037	Youth – Participatory Video & Adolescent Psychology	90
SC5038	Elderly – Reminiscence Theatre & Psychological Perspectives in Ageing	90

FULL-TIME	THIRD YEAR	HOURS
SC5028	Cultural Diversity	45
SC5032	Graduation Project	180
SC5056	Grants, Proposals and Evaluation	45
SC5057	Graduation Project	
LC1157	Communicating for Professional Effectiveness	30
IB1002	Internship	756

Diploma in

Creative Writing For TV AND New Media

(DTVM)

Have you ever dreamt of turning your love of words into a fulfilling career in television and digital media? This may involve scriptwriting, journalism, documentary production, professional blogging or podcasting. The Diploma in Creative Writing for TV and New Media (DTVM) helps you turn inspiration into success — to dream it, write it, make it.

How do words combine with pictures, video and sound to tell stories? How will you craft a message that resonates with an entire generation — maybe even several? DTVM develops and hones your ability to find, shape and realise your stories, fine-tuning them into polished messages for television.

Here at CASS, authentic learning means taking your story from the drawing board to the audience. Produce documentaries, TV scripts, webisodes and other types of content for mobile applications and digital platforms.

COURSE MODULES

FULL-TIME	FIRST YEAR	HOURS
SC8101	Writing Across Media Platforms	90
SC8102	Deconstructing Television	45
SC8103	Story Classics: Heroes, Myths and Legends	45
SC8104	Creative Story Making	60
SC8105	Storytelling I: Visual Communication	60
SC8106	Storytelling II: Conceptualisation and Structure	60
SC8107	Scriptwriting for Television I: Entertainment Programmes	60
SC8108	Video Production Principles and Practices	105
SC8109	Communication Skills for Media Makers	45
SC8110	World Issues and the Media Maker	45
LC8001	General Education 1	30
LC8002	General Education 2	30

FULL-TIME	SECOND YEAR	HOURS
SC8111	Research and Interview Techniques	45
SC8139	Storytelling III: Character and Plot Development	60
SC8116	Journalism I: News Writing for the Global Audience	45
SC8118	Journalism II: Total Journalism	45
SC8120	Web Publishing and Design	75
SC8129	Scriptwriting for Television II: Drama and Comedy	105
SC8130	Video Production for Narratives I: Drama and Comedy	60
SC8131	Video Production for Narratives II (Documentary)	75
SC8132	Transmedia Storytelling	45
SC8138	Introduction to Documentary	75
LC8003	Social Innovation Project	30
LC8004	General Education 3	30

FULL-TIME	THIRD YEAR	HOURS
SC7762	Media Law and Ethics	60
SC8126	Internship	924
SC8133	Media Entrepreneurship	75
SC8134	On-Location Production	60
SC8135	Creative Writing Project	105
	Free Elective*	45

* Students will select from various writing and media-related electives.

WITH THIS COURSE, YOU WILL:

- Be inspired. Find your muse in The Writers' Room, our unique space for dreaming and writing. Through our master classes, network with seasoned journalists, scriptwriters, filmmakers, animators, comic strip artists and other media professionals from Singapore and around the world.
- Leave the classroom. Record your news, drama, comedy, reality show or documentary in studio settings or outdoors. Travel overseas to film a documentary as an assignment. Intern with reputable media networks or related companies.
- Pitch your programmes to industry experts and, if selected, watch them come alive on TV.

Join us — Dream it. Write it. Make it.

YOUR FUTURE

Lift off into a successful career. Your skills in original content creation will be highly marketable. We open the door to a variety of rewarding career options in various industries such as media and publishing, government and community:

- Writer for Web, Radio and TV
- Journalist
- Content Producer
- Research Writer
- Assistant Producer
- Assistant Director
- Transmedia Producer

You may pursue a degree in Arts and Social Sciences, Journalism, Mass Communication, Film Studies, New Media Communication and other related degrees.

DTVM graduates have been accepted into degree programmes at local and foreign universities. Some of these universities grant generous exemptions and advanced standing to our graduates.

Diploma in

Media AND Communication

(DMC)

The Diploma in Media and Communication (DMC) is a comprehensive mass communication course that helps you to connect with people by telling compelling stories. Learn how to create engaging content and plan effective communication campaigns using print, broadcast and digital media.

DMC will prepare you for the fast-paced world of modern communication, from producing online content and managing social media to executing multi-market campaigns and everything in between.

A variety of creative challenges awaits you in The Agency, DMC's very own learning space that simulates a 21st century communications agency. DMC students also benefit from our partnerships in the industry and with industry greats like Ian Batey, the man behind the branding of Singapore Airlines and the Raffles Hotel.

In the final year, you will choose from a range of practicums that focus on integrated communication and content production. At DMC, authentic learning means you will work closely with our industry partners to nurture your aspirations. You will also get to apply SP's unique Design Thinking methodology to real world projects.

WITH THIS COURSE, YOU WILL:

- Produce branded content for online and traditional platforms that captivates your audience and generate buzz.
- Create, develop and pitch real-world campaigns at The Agency, a facility modelled after an actual communications agency.
- Hold media conferences and get your research work published by national and regional media. Our students have won accolades in national competitions such as the Crowbar Advertising Challenge.
- Nurture your talents and aspirations and build your portfolio in SPACE Agency, an out-of-classroom incubator that allows students to work on industry projects.
- Learn from the best in the media and communication industry through our master classes, industry visits, talks and networking sessions. Branding legend, Ian Batey, who was behind icons such as Raffles Hotel and Singapore Airlines, will personally mentor recipients of the prestigious Batey Talent Programme.

YOUR FUTURE

Embark on an exceptional career in the media and communication industry. With a Diploma in Media & Communication, you can be any of the following:

- Advertising Executive
- Content Marketing Specialist
- Content Writer/Producer
- Social Media Analyst
- Communication Strategist
- Public Relations Executive
- Corporate Communication Executive
- Feature Writer
- Media Planner

You may pursue a degree in Communication, Business, Arts and Social Sciences and other related courses.

DMC graduates have been accepted into degree programmes at local and foreign universities. Some of these universities grant generous exemptions and advanced standing to our graduates.

COURSE MODULES

FULL-TIME	FIRST YEAR	HOURS
SC770Y/Z	Integrated Marketing Communication in Action	90
SC771Y/Z	Professional Communication	120
SC772Y/Z	Visual Communication	120
SC773Y/Z	Video Production and Digital Post	120
SC7744	Introduction to Business	60
SC7745	Social Psychology	60
SC774Y/Z	Human Mind and Behaviour	90
LC8001	General Education 1	30
LC8002	General Education 2	30

FULL-TIME	SECOND YEAR	HOURS
SC7746	Mass Media Research	60
SC7747	Public Relations	45
SC7748	Advertising	45
SC7749	Consumer Psychology	60
SC7750	Radio and TV Production and Management	60
SC7751	News and Feature Writing	45
SC7752	Social Media	60
SC7753	Media Psychology	45
SC775Y/Z	Student Integrated Marketing Communication Agency	120
SC7762	Media Law and Ethics	60
LC8003	Social Innovation Project	30
LC8004	General Education 3	30

FULL-TIME	THIRD YEAR	
SC7754	Final Year Project	120
SC7760	Internship	756
Practicum		
(Choose one of the following specialisations:)		
SC7755	Centre for Social Media	90
SC7756	SPACEmedia	90
SC7757	Writing Lab	90
SC7758	Agency Start-up	90

COMMUNICATION SKILLS PROGRAMME
(ComSkills)

CASS offers a range of language and communication skills modules. These modules help students in their academic studies, prepare them for jobs, and provide enrichment in language experience and life skills.

These modules are offered in full-time and part-time Diploma Courses.

All academic schools select a number of modules from the list below for inclusion as core modules in the full-time and part-time diploma courses, as specified in their course structures:

- Communicating for Personal & Team Effectiveness
- Communicating for Project Effectiveness (Proposal)
- Communicating for Project Effectiveness (Report)
- Communicating for Professional Effectiveness
- Effective Business Communication Skills
- Interpersonal Skills & Proposal Writing

GENERAL EDUCATION PROGRAMME
(GenEd)

The General Education (GenEd) Programme is an institutional programme offered to all students in SP. It aims to broaden the perspectives of students, develop their ability to express an informed point of view, equip them with the mindsets and skills to engage with social issues, and inculcate in them a sense of personal responsibility.

There are four semester-long modules offered under the GenEd programme over a two-year period:

- General Education 1 (Critical Reasoning & Argumentation)
- General Education 2 (Critical Reasoning & Persuasion)
- General Education 3 (Issues & Perspectives)
- Social Innovation Project

SINGAPORE POLYTECHNIC OUTSTANDING TALENT (SPOT) PROGRAMME

The SPOT programme is SP's talent development programme managed by CASS. Through specially designed workshops, modules and conferences, SPOT aims to shape today's youths into tomorrow's leaders, communicators, humanitarians and scholars. For more information on the SPOT programme, please visit the SPOT website at **www.sp.edu.sg/spot**

POLYTECHNIC FOUNDATION PROGRAMME
(PFP)

Started in AY2013/2014, this new programme is offered to Secondary 4 Normal (Academic) stream students who have completed their GCE N(A)-Level examination. This year-long programme prepares students for their academic studies in the polytechnic.

CASS offers three modules in the PFP. All students enrolled in the PFP will take the modules below as specified in their curriculum structure:

- Foundation Language & Communication Skills
- Culture, Aesthetics & Society
- Active & Effective Citizenry

FOREIGN LANGUAGES

Asian and European language courses are offered as enrichment modules to fulltime students outside of curriculum time. Students may opt for beginner-level modules in the following languages, which are offered depending on demand:

- French
- German
- Japanese
- Korean

BUSINESS COMMUNICATION CENTRE (BCC)

Recognising that communication skills are critical in the industry, CASS established the Business Communication Centre (BCC) in 1994. BCC is the training arm of CASS and is committed to providing high quality language and communication courses to private and public organisations in Singapore and the region. The BCC team has conducted numerous language and communication courses for foreign employees, international students and working professionals. BCC's forte lies in its customisation of short and intensive courses for organisations, companies and schools. In addition, the BCC's trainers are highly qualified experts in the various language and communication fields.

BCC has conducted training programmes for organisations such as Bayer Healthcare (South East Asia) Pte Ltd, AP Moller Singapore, Ministry of Foreign Affairs, Ministry of Education, Ministry of Manpower, Agency for Integrated Care, Nissho Odyssey Ship Management Pte Ltd, National Colleges of Technology in Japan, and many more.

FACILITIES

Our innovative spaces define borderless learning — learn it by living it.

The Agency — your space for connecting
Experience the workings of a real integrated marketing communication agency. The Agency also boasts additional studios that include a single-camera visual studio, a radio studio and editing suites.

The Writers' Room — your space for enchantment and inspiration
Lose yourselves in this physical space and find inspiration. In The Writers' Room, mobile furniture replaces conventional tables and chairs. Stack blocks to make your own 'fortress' — the possibilities are as endless as your imagination.

Black Box — your space for creating stories that transform
Imagine a room that can be anything and everything you want it to be. Harnessing the power of movable configurations of lighting, seating and stage, students of our Diploma in Applied Drama & Psychology rehearse, enact and re-enact scenes and plays in this versatile, performance-ready room.

Our other facilities also offer presentation, film-screening, audio and video recording and playback features, allowing you to interact with, appreciate and create exceptional stories.

They are:

- CASS Multimedia Room 1 (T2126)
- CASS Multimedia Room 2 (T2127)
- CASS Media Lab 1 (T2123)
- CASS Media Lab 2 (T2124)
- CASS Media Lab 3 (T2125)

Design

EXPERIENCE & PRODUCT DESIGN

GAMES DESIGN & DEVELOPMENT

INTERIOR DESIGN

VISUAL COMMUNICATION & MEDIA DESIGN

With SP, it's So Possible

SP | DESIGN SCHOOL

DESIGNING EXPERIENCES ENRICHING LIVES

Good design matters because it can change the way we shape, perceive, understand, enrich and experience the world.

At SP Design School, our pedagogy engenders quality design education through experimentation, craft, making, critical thinking and design research. Our four design diplomas provide essential training from domain design skills to various design specialisations. Students are taught to anticipate trends, challenge conventions and make a difference through their designs in the world through meaningful experiences. They are exposed to the entire design process from idea generation to design development and prototyping. Our students will have opportunities to collaborate with industry partners, design professionals and world-renowned institutions where opportunities abound for students to participate in exhibitions, master classes and workshops. These platforms pave an industry-ready learning journey for the SP Design School student upon graduation.

We endeavour to mould our graduates to be imaginative, critical, always curious and experimental, and at the same time embody an entrepreneurial spirit so crucial to today's industry.

Welcome to SP Design School. Where good design matters.

A WIDE RANGE OF COURSES

Underpinning the four diploma design courses is the Common Foundation Programme. This programme in the first semester of year one is designed to equip students new to the field of design with foundational 2D and 3D skills in graphic communication, visual arts studio, foundational design studio, design theory and research, basic drawing class and course specific skills.

The curricula underpinning our diploma design courses focus on teaching a robust mix of creative and critical thinking skills, industry-relevant technology and technical knowledge, theory and practice, craft and making in the design studio. The SP Design School curriculum has been given accreditation and advanced standing from local and overseas tertiary design institutions.

INDUSTRY EXPOSURE (INTERNSHIP PROGRAMME)

All students are required to go through a minimum 12-week internship programme at the end of Year 2/3. In additional, the school works closely with industry and professional partners in collaborative studio projects intended to value-add to students' multi-discipline portfolio.

** All full-time diploma students are required to take two compulsory Education and Career Guidance Modules in SP. Students will take SP101A: Education and Career Guidance 1 – Personal Development (15 hours) in their first year. In their second or third year, students will take SP201A: Education and Career Guidance 2 – Career Development (30 hours).*
** All students are required to take one compulsory Sports for Life (SFL) module for one semester in their first year in SP. In their second and third year,students may sign up for SFL module as an elective.*

Diploma in

Experience AND Product Design

(DXPD)

We invite students who are hands on and love to make things. We train students to question and imagine how things can be done differently and better.

This course teaches you to design meaningful experiences through a range of industry-relevant skills like model making, design research, ideation and presentation techniques.

The course programme gives exposure to the various facets of experience and product design. You will enjoy an exciting learning journey that covers contemporary topics such as food, product, furniture, digital app to service design.

Over the years, we have fostered close working relationships with award-winning designers and the industry, connecting our students to the world of design.

Join us for a fulfilling and immersive learning journey that sets out to develop professional designers well-versed in creating meaningful design experiences and products.

COURSE WORK

The Diploma in Experience and Product Design (DXPD) aims to produce specialised Experience Designers equipped with Product Making knowledge, Experience Design Thinking and User Research Methods.

This unique course focuses on training the students to understand the users, find patterns and translate them into creative and meaningful experiences.

Our students will be trained in Experiential studies, Design Thinking, Applied Imagination, User Research Methods, Storyboarding and Design Development.

ASSESSMENT

Most of the modules (year-long and semester-long) are in-course assessed. The assessment activities may consist of projects, tests, written reports, case studies, group work and assignments. Critique sessions and portfolio reviews will be conducted.

CAREER PROSPECTS

The training and knowledge acquired from this programme will allow graduates to be competent in creative design skills backed with a strong foundation in craftsmanship, user research methods and technology. Graduates who have done well for the course may be able to apply for advanced standing to do a degree in a university.

Career options include Design Researcher, Industrial Designer, Multi-disciplinary Designer, Product Designer, User Experience Designer, and User Interface Designer

COURSE STRUCTURE

DXPD is a 3-year full-time diploma course. The modules are divided into both year-long and semester-long sessions. To qualify for the Diploma, a student must pass all the modules.

COURSE MODULES

FULL-TIME	FIRST YEAR	HOURS
Year Long		
SD006Z	Design Theory and Research I	60
Semester 1 COMMON FOUNDATION		
SD0002	Foundation Design Studio	60
SD0003	Basic Drawing Class	45
SD0005	Experience Design Methods	30
SD0006	Logic Design	30
SD0007	Course Specific Skills	30
SD0008	Graphic and Visual Communication	60
LC1054	Communication for Personal and Team Effectiveness	30
LC8001	General Education 1	30
Semester 2		
SD4101	Experience Design Studio I	105
SD4104	Visualisation and Communication Fundamentals	60
SD4105	Interactions and Service Fundamentals	45
SD4106	Materials & Prototyping Fundamentals	45
SD4107	Research Methods Fundamentals	45
LC8002	General Education 2	30

FULL-TIME	SECOND YEAR	HOURS
Year Long		
SD405Z	Experience Design Studio II	180
SD412Z	Interactions and Service for Experience Design	90
SD413Z	Visualisation and Communication for Experience Design	120
SD414Z	Research Methods for Experience Design	90
SD415Z	Materials & Prototyping for Experience Design	90
SD601Z	Design Theory and Research II	60
Semester 1		
LC8004	General Education 3	30
Semester 2		
LC8003	Social Innovation Project	30
DESIGN SCHOOL ELECTIVE (CHOOSE ONE)		45
SD7201	Rapid Prototyping	
SD7203	Virtual and Augmented Reality	
SD7204	Digital Visual Storytelling	

FULL-TIME	THIRD YEAR	HOURS
Year Long		
SD602Z	Design Theory and Research III	60
Semester 1		
SD4305	Professional Practice Project	120
IA8004	Internship Programme	
Semester 2		
SD4306	Experience Design Studio III	240

Diploma in

Games Design AND Development

(DGDD)

People of all ages are playing games because they are fun and entertaining. Some of the exciting games that you may be playing right now are created locally by Singapore based game studios. Have you ever wondered what it is like to create such games?

The games industry is fast-growing and games are changing the way we interact with the world. In fact, games are not just designed for entertainment purposes only. They are designed to aid in education, therapy and other applications as well. The Diploma in Games Design and Development (DGDD) will help you to open the gateway to the games industry as you learn how to design and develop different types of fun and engaging games.

The course encourages you to explore the different pathways in the games industry with game design as the core. You get to learn and experience the different aspects of game development like game design, level design, user interface design, character illustration, 3D modelling, animation, gameplay programming and game project management. Discover your talent as you go through the course.

Join us now and embark on the quest in creating your own games in the Diploma in Games Design and Development.

COURSEWORK

The teaching approach has an emphasis on project-based work, adopting a studio culture and process. Other than lectures and tutorials, there are drawing classes, workshops, research work, field trips, in-class assignments, project development work, presentation and critique sessions. The students' practical, theoretical, intellectual and creative skills are developed through project work, reinforced with peer learning, and supported by this studio process which closely follows the industry practice. The studio process is a critical component for the infusion of design values and rigorous development discipline required of the design and creative fields. Students will immerse themselves in a rigorous design and practice environment that is project-focused and driven intensely by lecturers and peers. The approach fosters a sense of rapport and personal ownership of the studio space and of the works that come out of it.

ASSESSMENT

All modules use in-course assessment. The activities include presentations and critiques, submission of reports, assignments, and project work. The project work involves research and analysis, problem-solving, carrying out simulation and play testing, as well as design and development of prototypes. Review of students' portfolio building is another component under assessment. Advisory members and mentors from higher academic institutions and industry professional practitioners are regularly engaged for curriculum review to ensure quality of the programme is maintained.

CAREER PROSPECTS

The training and knowledge acquired from this programme would allow graduates to be competent in creative design skills and understanding of the design process backed with a strong foundation in digital technology and design tools for games. Career options for our graduates include 2D Artist, 3D Artist, Animator, Concept Artist, Game Designer, Game UI/UX Designer, Gameplay Programmer, Game Quality Assurance Tester, and Level Designer.

COURSE STRUCTURE

In the second semester of year 2, students are required to choose either game art elective or game programming elective on top of the compulsory modules. The modules are divided into both year-long and semester-long sessions. Students are also required to complete a 12-week Internship Programme. To graduate, a student must pass all the modules.

COURSE MODULES

FULL-TIME	FIRST YEAR	HOURS
Year Long		
SD006Z	Design Theory and Research I	60
Semester 1 COMMON FOUNDATION		
SD0002	Foundation Design Studio	60
SD0003	Basic Drawing Class	45
SD0005	Experience Design Methods	30
SD0006	Logic Design	30
SD0007	Course Specific Skills	30
SD0008	Graphic and Visual Communication	60
LC1054	Communication for Personal and Team Effectiveness	30
LC8001	General Education 1	30
Semester 2		
SD3107	Game Art and Animation I	75
SD3106	Game Design I	45
SD3102	Game Design and Development Studio I	105
SD3105	Game Programming I	45
LC8002	General Education 2	30

FULL-TIME	SECOND YEAR	HOURS
Year Long		
SD601Z	Design Theory and Research II	60
SD314Z	Game Design II	90
SD304Z	Game Design and Development Studio II	240
Semester 1		
SD3203	Game Art and Animation II	60
SD3205	Game Programming II	45
LC8003	Social Innovation Project	30
Semester 2		
ST0276	Ethics and Law of IT and Media	30
MS0151	Mathematics for Games (for students taking Game Programming III)	60
LC8004	General Education 3	30
SD7203	Virtual and Augmented Reality	45
COURSE ELECTIVES (CHOOSE ONE)		
SD3204	Game Art and Animation III	105
SD3206	Game Programming III	45
DESIGN SCHOOL ELECTIVE (CHOOSE ONE)		45
SD7201	Rapid Prototyping	
SD7202	User Experience Design	
SD7204	Digital Visual Storytelling	

FULL-TIME	THIRD YEAR	HOURS
Year Long		
SD602Z	Design Theory and Research III	60
SD315Z	Game Art and Animation IV	180
SD316Z	Game Design III	60
SD307Z	Game Design and Development Studio III	225
SD317Z	Game Programming IV	180
Semester 1		
IA8002	Internship Programme	

Diploma in

Interior Design

(DID)

If you are intrigued by the design of space, transforming the experience of everyday living and have a curious mind to experiment with materials — you are the budding designer we want.

The course is developed to prepare students for the design industry, equipping graduates with relevant design knowledge and skills.

Our programme focuses on spatial experimentation with materials, lighting and colour. You will also be trained in design methods and processes to develop exciting ideas to create meaningful interior spaces, as well as means to communicate them.

Join us in our fully immersive design culture, incorporating a rigorous curriculum from exploratory projects to collaborations with industry and institutions.

COURSE WORK

Students are nurtured to develop their design skills and creativity through guided design studio projects that are both exploratory and applicable in real life. Basic design skills are introduced during the common foundation in the first semester of first year and students are taught research and design techniques that will allow them to find unique ways to interpret and design. Visualisation techniques are an important part of an Interior Designer's ability to express, thus both manual drawing and Computer Aided Design and presentation skills are taught from the first to third year. Students also learn theory of design, construction technology and detailing to develop their creative and critical thinking skills in a project. The hands-on studio-based environment helps inculcate the maker culture in students, as well as to promote independent thinking and teamwork in an interior design practice. Students have opportunities to gain overseas experiences through study trips, specialised workshops, industrial attachment training and overseas immersion programmes.

ASSESSMENT

Most of the modules are year-long and semester-long and are in-course assessed. The assessment activities consist mainly of projects, tests, written reports, case studies, group work and assignments. Students are expected to present their projects at critique sessions and portfolio reviews.

CAREER PROSPECTS

The skillsets and training of graduates from the Diploma in Interior Design equips students with the ability to design creatively as well as possess the required technical skills to communicate their designs in 2D or 3D. Career options for our graduates include Design Executive (Sales), Exhibition Designer, Interior Designer, Perspective Artist, Spatial Planner, Stage-set Designer Visual Merchandiser, and Walk-through Animator. Graduates who have done well for the course may also be able to apply for advanced standing to selected courses in local and overseas universities.

COURSE STRUCTURE

The Diploma in Interior Design (DID) course is a three-year full-time diploma course. The modules are divided into both year-long and semester-long sessions. After Common Foundation in Semester 1, students will begin the Year 1 Interior Design which focuses on the essential skillsets within a residential context. In Year 2, students are equipped with more advanced skillsets while exploring the design of commercial and retail spaces. All students will then be required to complete a 12-week Internship Programme. In Year 3, students will engage in more experimental and explorative projects to stretch their design skills. The programme ends with the Final Year Project in the final semester where students select the project that best suits their strengths and interest. To qualify for the DID, students are required to pass all modules and the Internship Programme.

COURSE MODULES

FULL-TIME	FIRST YEAR	HOURS
Year Long		
SD006Z	Design Theory and Research I	60
Semester 1 COMMON FOUNDATION		
SD0002	Foundation Design Studio	60
SD0003	Basic Drawing Class	45
SD0005	Experience Design Methods	30
SD0006	Logic Design	30
SD0007	Course Specific Skills	30
SD0008	Graphic and Visual Communication	60
LC1054	Communication for Personal and Team Effectiveness	30
LC8002	General Education 2	30
Semester 2		
SD1101	Interior Design Studio I	120
SD1103	Interior Design Communication I	75
SD1102	Materials and Technology I	45
LC8001	General Education 1	30

FULL-TIME	SECOND YEAR	HOURS
Year Long		
SD112Z	Interior Design Studio II	240
SD113Z	Interior Design Communication II	150
SD601Z	Design Theory and Research II	60
SD116Z	Materials and Technology II	120
Semester 1		
LC8003	Social Innovation Project	30
Semester 2		
SD1201	Interior Design Practice – Fundamentals	30
LC8004	General Education 3	30
DESIGN SCHOOL ELECTIVE (CHOOSE ONE)		45
SD7202	User Experience Design	
SD7203	Virtual and Augmented Reality	
SD7204	Digital Visual Storytelling	

FULL-TIME	THIRD YEAR	HOURS
Year Long		
SD114Z	Interior Design Studio III	210
SD118Z	Interior Design Communication III	45
SD602Z	Design Theory and Research III	60
SD117Z	Materials and Technology III	90
Semester 1		
SD1301	Interior Design Practice – Advanced	30
IA8001	Internship Programme	

Diploma in

Visual Communication AND Media Design

(DVMD)

If you are intrigued by graphic design and advertising that engage your senses, and passionate about experimenting with emerging media — you are the fearless one we want.

Students are prepared for a fast-evolving creative industry landscape, with the knowledge to apply ideas and communicate across many media platforms.

Our comprehensive programme exposes you to the many facets of visual communication and media design – graphic design, advertising, branding, digital photography, illustration, video production and interaction design. You will be immersed in a dynamic environment and exposed to multiple media skills, enabling you to discover and develop your creative strengths.

Join us in our inspiring design programme incorporating a rigorous curriculum from exploratory projects to exciting collaborations with emerging and brands in the industry.

COURSEWORK

Our unique curriculum has been structured to train graduates with a superb grounding in design fundamentals and practice, who are able to generate creative design concepts, and produce innovative experiences that integrate the use of various media from traditional to new media for brand communications and touch points.

Students receive exposure to the many facets of visual communication and media design, from graphic design, digital photography, video production, interaction design to branding communications. Students learn to use text, graphics, colours and images to help unveil, explain, educate and enlighten audiences through these different media channels.

They are also instructed with a broad array of critical and creative problem solving skills, and can function well in a variety of existing, new and emerging media environments.

Students enrolled in the Diploma in Visual Communication and Media Design (DVMD) course get ample exposure to all facets of the design and advertising industries. Filled with exciting opportunities to exercise their creativity, the course offers students many avenues to explore and exploit technologies, tools, techniques and methods to create innovative and inspiring designs for print, interactive, and integrated media.

Trained to generate winning concepts and to develop a portfolio of exciting work, students are given opportunities and mentored to enter international competitions, like the D&AD, Crowbar Awards, and be exposed to world class design standards through invited speakers, international design forums and competitions.

With their industrial attachments, students gain relevant and valuable first-hand industrial experience with reputable organisations to enhance their career prospects, and to work on real-world design projects and clients.

ASSESSMENT

As DVMD is practical oriented, all modules are in-course assessment-based. The types of continuous assessments include design work, presentations, critiques, project reports and written tests.

CAREER PROSPECTS

Work in exciting graphic design houses, advertising agencies, branding consultancies, in-house creative departments, photography studios, publishing houses, interactive agencies and production houses upon your graduation.

You would be employed as an Editorial Designer, Graphic Designer, Junior Art Director, Packaging Designer, Interaction Designer, Photographer, or Videographer.

Graduates who have done well for the course may be able to apply for advanced standing to a degree in a local or overseas university.

COURSE STRUCTURE

DVMD is a 3-year full-time diploma course. The modules are divided into both year-long and semester-long sessions. To qualify for the diploma, students are required to pass all the modules, as well as a 12-week internship programme.

COURSE MODULES

FULL-TIME	FIRST YEAR	HOURS
Year Long		
SD006Z	Design Theory and Research I	60
Semester 1 COMMON FOUNDATION		
SD0002	Foundation Design Studio	60
SD0003	Basic Drawing Class	45
SD0005	Experience Design Methods	30
SD0006	Logic Design	30
SD0007	Course Specific Skills	30
SD0008	Graphic and Visual Communication	60
LC1054	Communication for Personal and Team Effectiveness	30
LC8002	General Education 2	30
Semester 2		
SD2102	Visual Design Studio	105
SD2104	2D Motion Graphics	60
SD2106	Digital Photography and Image Processing	30
SD2107	Digital Arts Studio	45
LC8001	General Education 1	30

FULL-TIME	SECOND YEAR	HOURS
Year Long		
SD601Z	Design Theory and Research II	60
SD220Z	Brand Design Studio	360
SD221Z	Web Design	105
Semester 1		
SD2206	Video Fundamentals	60
ST0276	Ethics and Law of IT and Media	30
LC8003	Social Innovation Project	30
Semester 2		
SD2205	Portfolio Design	30
LC8004	General Education 3	30
DESIGN SCHOOL ELECTIVE (CHOOSE ONE)		45
SD7201	Rapid Prototyping	
SD7202	User Experience Design	
SD7203	Virtual and Augmented Reality	

FULL-TIME	THIRD YEAR	HOURS
Year Long		
SD602Z	Design Theory and Research III	60
SD230Z	Communication Design Studio	375
Semester 1		
IA8003	Internship Programme	


Digital Media
AND
Infocomm Technology
DIGITAL ANIMATION
MUSIC & AUDIO TECHNOLOGY
VISUAL EFFECTS & MOTION GRAPHICS
BUSINESS INFORMATION TECHNOLOGY
INFOCOMM SECURITY MANAGEMENT
INFORMATION TECHNOLOGY
With SP, it's So Possible
"Insta-worthy locations for photographers!"
LocatLor
SP
SCHOOL OF
DIGITAL MEDIA &
INFOCOMM TECHNOLOGY

The School of Digital Media & Infocomm Technology (DMIT) aims to be a strong source of talent in a world where technology is revolutionising the way we do things. To prepare aspiring Infocomm and Media professionals for the challenges ahead, DMIT has put in place different avenues to nurture and develop students in a holistic manner. This includes the use of innovative teaching approaches, inspiring learning spaces, immersive experiences, multidisciplinary projects and leadership training programmes.

Moving ahead, the school believes in preparing students to be future technology leaders as part of Singapore's Smart Nation Vision, and to continue to create a digital world beyond limits!

INNOVATIVE TEACHING APPROACH

We offer an unparalleled approach to teaching, through apprenticeship, scenario-based and studio-based learning. Coupled with the integration of soft skills into these teaching approaches, it enables our students to be highly engaged, challenged and inspired.

INSPIRING LEARNING SPACES

Our learning spaces are specially designed to draw out the creative genius in each student. This includes our Cyber Wargame Centre, M.A.D. Studios, Social Media Listening Centre and Yellow Submarine.

IMMERSIVE DMIT EXPERIENCE

Students get to mix with the who's who in the industry through masterclasses, immersion programmes and mentorship programmes with industry professionals.

Students are placed on the cutting edge through high-level competitions, industry certifications, live industry projects and real-life work experiences.

MULTIDISCIPLINARY PROJECTS

We have the distinct advantage of housing digital media and IT under one roof. This gives us the flexibility and capability to build multidisciplinary projects that cut across boundaries. The fusion of IT and digital media spurs innovation and creates endless digital possibilities.

EXCLUSIVE SCHOLARSHIP/ FINANCIAL ASSISTANCE

Scholarships are available for students who demonstrate good performance and aptitude in their studies. Interest-free study loans and grants are also available to those in need.

EXPERIENCED AND NURTURING LECTURERS

Our lecturers are highly qualified professionals with industry or government work experience spanning information systems, games development, animation, short film and audio production. They stay current with the latest technological trends and employment needs of the industries through consultancy, R&D projects, industrial attachments and staff development programmes.

Award-winning student projects are made possible by the sheer dedication and commitment from our lecturers, many of whom devote countless hours in mentoring our students.

OUR COURSES

We offer six full-time diploma courses and five part-time diploma courses.

FULL-TIME INFOCOMM TECHNOLOGY COURSES

- Diploma in Business Information Technology (DBIT)
- Diploma in Infocomm Security Management (DISM)
- Diploma in Information Technology (DIT)
  - Game Development Option
  - Solutions Development Option

FULL-TIME DIGITAL MEDIA COURSES

- Diploma in Digital Animation (DDA)
- Diploma in Visual Effects and Motion Graphics (DVEMG)
- Diploma in Music and Audio Technology (DMAT)

PART-TIME DIPLOMA COURSES

- Diploma (Conversion) in Digital Media Creation
- Diploma (Conversion) in Web & Programming
- Specialist Diploma in Web Development Technology
- Specialist Diploma in Mobile Apps Development
- Specialist Diploma in Cyber Security Management
- Specialist Diploma in Cyber Security (Earn and Learn Programme)

On top of offering diploma courses in Digital Media and Infocomm Technology, we also offer our expertise and experience through consultancy services to the industry. We establish strategic partnerships with the industry players in joint projects and offer continuing education courses to encourage life-long learning.

** All full-time diploma students are required to take two compulsory Education and Career Guidance Modules in SP. Students will take SP101A: Education and Career Guidance 1 – Personal Development (15 hours) in their first year. In their second year, students will take SP201A: Education and Career Guidance 2 – Career Development (30 hours).*

** All students are required to take one compulsory Sports for Life (SFL) module for one semester in their first year in SP. In their second and third year, students may sign up for SFL module as an elective.*

Diploma in

Business Information Technology

(DBIT)

In today's new digital economy, companies find an increasing need to invest in technological capabilities to remain successful in business.

Business Analytics and Social Media Listening play an increasingly important role in helping businesses analyse their performance and devise business strategies. Possessing an entrepreneurial mindset is also crucial to succeed in today's business world.

The Diploma in Business Information Technology (DBIT) provides you with a strong foundation in the areas of Social Media, Business Analytics, Web and Mobile Apps Development, and Technology Entrepreneurship to create business success!

There will be numerous opportunities for overseas programmes such as Study Trips, Immersion Programmes, Internships, Community Projects and Student Exchange Programmes.

Students will also be empowered to take up leadership roles in various enrichment forums, seminars and community projects.

Outstanding students with good academic results, strong leadership potential, and are active in CCA, can look forward to be awarded a scholarship or IT talent development programme:

- Centre for Strategic Infocomm Technologies (CSIT) Diploma Scholarship
- Infocomm Polytechnic (iPoly) Scholarship
- Industry Preparation for Pre-graduate (iPREP) Programme
- Singapore Polytechnic (SP) Scholarship

CAREER PROSPECTS

Exciting career opportunities await students when they graduate. The career options include Entrepreneur, IT Business Analyst/ Developer, IT Project Specialist, Mobile Solutions Analyst/Developer, Social Media Analyst, UX/GUI Designer, Web Analyst or Web Application Developer.

FURTHER STUDIES

Our curriculum gives students the flexibility to pursue either an IT or Business degree in both local and overseas universities with advanced standings. Our graduates have also won scholarships and studied in local universities like NUS, NTU and SMU, and overseas universities like University College London.

COURSE MODULES

FULL-TIME	FIRST YEAR	HOURS
BA0276	Accounting	60
LC0854	Communicating for Personal & Team Effectiveness	30
LC8001	General Education 1	30
LC8002	General Education 2	30
MS0105	Mathematics	60
ST0276	Ethics and Law of IT & Media	30
ST1001	Database Management Systems	75
ST1007	Social Media Marketing	60
ST1008	Web Client Development	75
ST2107	Digital Media for Business	75
ST2108	Business Marketing & Branding	60
ST2109	Business Opportunity	60
ST2111	Mobile Application Development I	75

FULL-TIME	SECOND YEAR	HOURS
LC0855	Communicating for Project Effectiveness	30
LC0857	Communicating for Professional Effectiveness	30
LC8003	Social Innovation Project	30
LC8004	General Education 3	30
MS0229	Business Statistics	60
ST2220	Web Applications Development	90
ST2223	Business Planning	45
ST2224	Social Media Analytics	60
ST2225	Interaction & Visual Design	60
ST2226	Mobile Application Development II	75
ST2227	Business Analytics	60
ST2230	Digital Analytics	60
ST2312	Business Intelligence	60

FULL-TIME	THIRD YEAR	HOURS
IB3002	Internship Programme	(17 weeks)
ST2320	Final Year Project	210
ST2321	Infographics	60
ST2322	Predictive Analytics	60
Electives (choose one from the following)		
BA0217	Fundamentals of Economics	60
ST0248	Programming for Data Science	60
ST0324	Internet of Things	60
ST2219	Enterprise Business Processes	60
ST2510	Independent Study I	60

Diploma in

Digital Animation

(DDA)

The popularity and application of digital animation has grown tremendously over the years. From animated features to game cinematics, comic illustration to product visualisation, these wonderful creations are the work of dedicated, creative and skilled professionals.

The Diploma in Digital Animation (DDA) prepares students for an exciting career in the world of digital animation. Our specially tailored curriculum and uniquely designed learning spaces provide an enriching experience that cultivates a student's creativity and skills through rigorous training in both the traditional and digital medium.

COURSEWORK

In this 3-year full-time programme, students will receive firm grounding in the traditional arts and the use of digital tools. Projects and assignments are designed to propel students to greater heights in both skills and creativity. We ensure that the complete animation production process is covered, from conceptualisation to final delivery. Students will also get to specialise in one of three areas: assets creation, character animation, and lighting and compositing.

Every student will have his/her own space to really call 'home'. They can be productive at their own personally decorated work area; get messy when they are sketching and sculpting; engage in creative discussion with industry clients. There is a dedicated space for each of these activities at the one-of-a-kind M.A.D. (Media-Art-Design) Studios.

Another core feature is the opportunity to learn from the masters of the trade from companies such as Lucasfilm and Ubisoft via the specially-tailored DDA Industry Mentorship programme, and also experience true out-of-classroom learning through activities like masterclasses, overseas internships and study trips, just to name a few.

CAREER PROSPECTS

Our graduates can look forward to an exciting and dynamic career in the digital media industry with roles such as 2D/3D animator, modeler, rigger, digital lighting artist, texture artist, concept artist, storyboard artist and layout artist.

FURTHER STUDIES

Many universities grant advanced standing to DDA graduates and admit them directly into the second or third year of a three-year degree programme.

COURSE STRUCTURE

This course has a combination of year-long and semester-based modules spread across six semesters. All students participate in a semester-long internship in Year 3. Students are required to pass all the modules to be awarded the DDA.

COURSE MODULES

FULL-TIME	FIRST YEAR	HOURS
General Education		
LC8001	General Education 1	30
LC8002	General Education 2	30
Year Long		
ST613Z	Introduction to 3D Computer Graphics	120
Semester 1		
LC0854	Communicating for Personal & Team Effectiveness	30
ST6105	History of Animation	45
ST6107	Graphic Design Principles	60
ST6108	Traditional Animation	60
ST6112	Drawing	90
Semester 2		
ST6511	Media Business	30
ST6100	Animation Studio I	90
ST6109	Figure Proportion & Anatomy	60
ST6110	Environment & Prop Design	60
ST6111	3D Animation Fundamentals	60

FULL-TIME	SECOND YEAR	HOURS
General Education		
LC8003	Social Innovation Project	30
LC8004	General Education 3	30
Semester 1		
LC0855	Communicating for Project Effectiveness	30
ST6223	Visual Storytelling	60
ST6232	Figure Drawing for Animation	60
ST6233	Rigging Fundamentals	45
Character Animation Specialisation		
ST6224	3D Body Mechanics	90
Digital Lighting and Compositing Specialisation		
ST6226	Digital Lighting & Rendering	90
Asset Creation Specialisation		
ST6235	Character Modelling & Setup	90

FULL-TIME	SECOND YEAR	HOURS
Electives Modules (Choose 1)		
ST6227	Digital 2D Animation	60
ST6267	Basic Dynamic Simulation	60
ST6268	Introduction to Game Art Integration	60
Semester 2		
ST6229	Animation Studio II	60
ST6234	Character Design	60
ST6239	Conceptualisation & Layout	60
ST6231	Portfolio Development	30
For students who choose the Character Animation Specialisation		
ST6219	Acting for Animation	60
ST6228	3D Character Animation	90
For students who choose the Asset Creation Specialisation		
ST6236	Digital Creature Modeling & Sculpting	90
ST6237	Environment & Prop Modelling	60
For student who choose the Digital Lighting and Compositing Specialisation		
ST6238	Advanced Lighting & Rendering	90
ST6507	Digital Compositing	60

FULL-TIME	THIRD YEAR	HOURS
Semester 1		
ST6310	Advanced Drawing	45
ST6334	Animation Studio III	240
Elective Modules (Choose 1 only)		
ST6332	Creature Effects	60
ST6333	Independent Study	60
ST6506	Motion Capture	60
Semester 2		
IB3001	Internship Programme	(17 weeks)

Diploma in

Infocomm Security Management

(DISM)

With the proliferation of computers and mobile devices, the need for security is rapidly gaining significance in today's world where important confidential information and critical infrastructure face risks from hacking. Loss of data, unauthorised access to computer systems, malware, social engineering, infrastructure destruction, cyberterrorism, system and application exploits are also threatening individuals and corporations daily. If these threats are not mitigated, there would be disastrous consequences.

Managing these Infocomm Security threats is critical and this has necessitated the growth of Singapore's pool of Infocomm Security Management experts - one of the key areas of focus in the latest National Cyber Security Masterplan.

WHY CHOOSE DISM

Being a DISM student gives one the competitive edge both future studies and career. Students can look forward to:

- Learning through war-gaming
- Comprehensive training in Infocomm Security Management
- A head start in NUS even before graduation
- Recognition from the industry through professional Infocomm Security certifications

LEARNING THROUGH WAR-GAMING

To give students an experience of being a real-life Infocomm Security Management professional, there is a learning space dedicated to them — Cyber Wargame Centre. The Cyber Wargame Centre allows the creation of different types of scenarios for students to learn hacking techniques, setting up of network defences and investigating computer crime scenes.

Students will be expected to put their skills to the test against their classmates in regular cyber war-game competitions. The learning will start from a simple network setup and then progress on to a bigger and more complex environment. This learning space encourages students to creatively use their acquired knowledge and skills in participating in cyber attack exercises, setting up defences and investigating cyber security scenarios. To add to the realism, the Cyber Wargame Centre has partnered IXIA to give students the opportunity to experience cyber attacks and test their network defences.

COMPREHENSIVE TRAINING IN INFOCOMM SECURITY MANAGEMENT

The DISM curriculum offers a comprehensive training in the field of Infocomm Security Management. Students will acquire skills and knowledge to manage security threats with modules such as Ethical Hacking and Defences, Applied Cryptography, Secure Coding, Digital Forensics & Investigation and Computer Law & Investigation. Students will also learn the techniques used by hackers to penetrate computer systems and also those by security professionals to defend against such attacks.

HEAD START IN NUS EVEN BEFORE GRADUATION

Students who meet NUS' programme criteria can choose to join the NUS-Poly Preparatory Programme at the end of Year 1. This programme gives students the special opportunity to take one NUS module each in Year 2 and Year 3 in SP. Upon successful completion of the programme, students will be eligible to enrol into the NUS' Bachelor of Computing (Information Security) degree programme through special admission.

GAIN RECOGNITION BY THE INDUSTRY THROUGH PROFESSIONAL SECURITY CERTIFICATIONS

To help students gain industry recognition, the DISM course provides opportunities for them to embark on external industry recognised certification programmes like ThinkSECURE Organisational Systems Security Analyst (OSSA), Organisational Systems Wireless Auditor (OSWA), EC-Council Certified Ethical Hacker (CEH) and Computer Hacking Forensic Investigator (CHFI).

There are also opportunities to acquire other IT-related certifications like the Proxor Software Developer Exam (SDE-Java). Students can pursue these additional certifications during their progressive years of study.

EXCITING RANGE OF ACTIVITIES BEYOND THE CURRICULUM

Students will have a chance to plan and organise events like ISACA Day (Information Systems Audit and Control Association), and the School Cybersafety talks to promote greater awareness of Infocomm Security among the community. Students can also look forward to embarking on field trips to relevant organisations, going on overseas trips, competing in Infocomm Security competitions and participating in peer sharing sessions in our Special Interest Groups.

INDUSTRY AND INFOCOMM SECURITY EXPERIENCE FOR FINAL YEAR PROJECTS AND INTERNSHIP

In their final year, students have the opportunity to consolidate the knowledge and polish the skills they have acquired during their DISM course by working on a Final-Year Project (FYP) and undergoing a 17-week Internship Programme. Students can be posted to research organisations such as DSO National Laboratories or A*STAR, government agencies like IMDA, IT security service providers like Vetra, consulting firms such as KPMG, or other organisations like PSA Singapore or HDB.

CAREER PROSPECTS

Students can look forward to respectable and exciting careers such as IT Security Consultants, Computer Forensics Investigators, Security or System Administrators and IT Auditors. There will be a demand for DISM graduates in various industries like IT security, auditing and consultancy, and in any organisation that requires IT Security Management services.

FURTHER EDUCATION

Students will have ample opportunities to further their studies both locally and overseas with generous advanced standings. Besides the local universities, students can also embark on various undergraduate courses in Infocomm Security, Digital Systems Security, Computer Forensics and Security Management with reputable foreign universities in Australia, UK and the United States.

DISM students who qualify for the Preparatory Programme for the Bachelor of Computing with NUS will undertake some NUS modules while they are in Year 2 and Year 3 of the DISM course. They will then continue their studies in NUS after they have completed the DISM course.

COURSE STRUCTURE

To be awarded the Diploma in Infocomm Security Management, a student must pass all the core modules and required elective modules.

COURSE MODULES

FULL-TIME	FIRST YEAR	HOURS
LC0856	Communicating for Project (Report) Effectiveness	30
LC8001	General Education 1	30
LC8002	General Education 2	30
MS0105	Mathematics	60
ST0313	Essential Linux System Administration	60
ST1001	Database Management Systems	75
ST1004	Infocomm Security	60
ST1008	Web Client Development	75
ST1012	Programming Fundamentals	90
ST1010	Network Fundamentals	60
ST2410	Computer Architecture & Operating Systems	75
ST2411	Programming in Python and C	60

FULL-TIME	SECOND YEAR	HOURS
LC0857	Communicating for Professional Effectiveness	30
LC8003	Social Innovation Project	30
LC8004	General Education 3	30
ST0291	Enterprise Application Development	75
ST2502	Computer Law & Investigation	45
ST2504	Applied Cryptography	60
ST2514	Digital Forensics and Investigation	60
ST2515	Secure Coding	60
ST2612	Securing Microsoft Windows	75
ST2613	Securing Linux	60
ST251Z	Ethical Hacking & Defences	180
Electives (choose one from the following)		
ST0249	AI & Machine Learning	60
ST0294	Geospatial Visualisation	60
ST2510	Independent Study 1	60
ST2513	Mobile Applications	60

FULL-TIME	THIRD YEAR	HOURS
ST2601	Infosec Project Development & Management	165
ST2610	Security Policy and Incident Management	60
ST2617	Malware Reverse Engineering	60
IB3003	Internship Programme	(17 weeks)
Electives (choose one from the following)		
ST0316	Advanced Java Programming	60
ST0324	Internet of Things	60
ST2312	Business Intelligence	60
ST2615	Independent Study II	60

Diploma in

Information Technology

(DIT)

The IDA's Annual Infocomm Manpower survey continues to show a steady increase in demand for infocomm talent, with a broad spectrum of infocomm job vacancies available.

The Diploma in Information Technology (DIT) provides a versatile, broad-based education in problem-solving using technology. We recognise the need for innovative thinkers within different industries that use Infocomm Technology, and provide a strong and flexible curriculum. Students are equipped with strong IT core competencies and are encouraged and empowered to develop their interests and knowledge. Students get to select areas in demand by industry, such as Software Design, Infocomm Security, Data Science, Interaction Design or Game Development.

DIT graduates have found success in a variety of career opportunities in every industry that leverages on IT, from Application Consultants to Developer Evangelists, Project Managers to Solution Architects, and Gameplay Programmers to Software Engineers.

DIT is a three-year full-time programme. Year 1 shares a common structure, followed by specialisation in Year 2, either in the Game Development (GD) Option, or the Solutions Development (SD) Option.

SOLUTIONS DEVELOPMENT (SD) OPTION

Infocomm is a vital enabler that transforms businesses. The Solutions Development (SD) Option equips students with the technical competency to lead, design and develop IT solutions that enable companies to become more competitive in the global arena through various platforms such as cloud, web and mobile devices.

In the SD Option, students have the further flexibility in choosing what they want to specialise in, through one of the following tracks:

The **Software Design** track provides the technical depth in software design and development.

The **Information Security** track focuses on the need to adapt to the changing intruder landscape and to gain a deeper understanding on information security and managing the infrastructure.

The **Data Science** track builds the competency to explore data, to create data visualization that provides insights for business decisions. It hones the skills to solve problems using statistical knowledge, cognitive services and machine learning.

The **Interaction Design** track offers modules to enhance students' ability to design enjoyable, pleasurable and aesthetically pleasing applications. Interaction technologies are evolving to match the user expectation of a more seamless, intuitive and immersive user experience.

GAME DEVELOPMENT (GD) OPTION

The game development industry is continuing with tremendous market growth globally. Singapore's games sector comprises over 60 game development, publishing and services companies, and is one of the fastest growing media sector. Ubisoft, Gumi Asia, Tecmo Koei and Bandai Namco are among the international gaming companies that have set up a base in Singapore.

Students can look forward to building a strong foundation in technical skills required as a game programmer or game level designer, to succeed and get a head start in carving a career in this challenging and competitive field.

TRAINING OPPORTUNITIES

Beyond the classroom, DIT students get different training opportunities locally or overseas, either with our industry partners, or renowned Institutes of Higher Learning (IHL).

Students get to select areas in demand by industry, such as Software Design, Infocomm Security, Data Science, Interaction Design or Game Development. For example, with the Microsoft Student Partners (MSP), students learn to become technology leaders in the campus, while meeting new people and becoming game changers of the future.

DIT students have also ventured overseas on learning journeys at Digital Hollywood University and Tokyo Game Show in Japan, and DigiPen's campus in Redmond, USA.

Students also get to gain a head start for further studies: with the Advanced Math Programme that prepares them for local university programmes, or earn Advance Credits for DigiPen Singapore, or gain exposure with Singapore Management University (SMU), all of these while studying in DIT at SP.

Outside of curriculum, DIT students are encouraged to propose and innovate their own projects, going on to win at competitions, such as the InnoServe Contest in Taiwan, as well as the SiTF Awards.

CAREER PROSPECTS

As a DIT graduate, students get to choose from a variety of career options:

- Analyst Programmer
- System Analysts
- IT Consultant
- IT Executive
- Software Engineer
- Web Application Developer
- Mobile App Developer
- Game Programmer
- Computer Graphics Programmer
- Game Level Designer
- Quality Assurance Tester, etc.

FURTHER EDUCATION

Students can look forward to pursuing their further education at local or foreign universities, with some granting direct entry into second or third year of study in relevant undergraduate degree courses in countries such as in Australia and the United Kingdom.

With relevant courses locally at NUS, NTU, SIT, SUTD, and SMU, students will be spoilt for choice.

COURSE STRUCTURE

DIT is a 3-year full-time course. The first year curriculum is common to all students, providing a solid foundation in core IT knowledge, effective communication skills and life-skills. From Year 2 onwards, students get to specialise in either the Game Development (GD) Option, or the Solutions Development (SD) Option. In the SD Option, students get to choose Specialisation Modules for their track of study. Students gain real work experience during a 17-week internship programme in their final year of study.

COURSE MODULES

FULL-TIME	FIRST YEAR	HOURS
LC0855	Communicating for Project Effectiveness	30
LC8001	General Education 1	30
LC8002	General Education 2	30
MS0105	Mathematics	60
ST0292	Network Management & Assurance	60
ST1001	Database Management Systems	75
ST1002	Digital Visual Design	60
ST1004	Infocomm Security	60
ST1008	Web Client Development	75
ST1010	Network Fundamentals	60
ST1011	Application Development	75
ST1012	Programming Fundamentals	90

SOLUTIONS DEVELOPMENT OPTION

FULL-TIME	SECOND YEAR	HOURS
LC8003	Social Innovation Project	30
LC8004	General Education 3	30
LC0857	Communicating for Professional Effectiveness	30
ST0257	Web Applications Development	75
ST293Z	Software Engineering Practice	150
ST0276	Ethics & Law of IT & Media	30
ST0277	Design for User Interaction	75
ST0281	Mobile Applications	75
ST2219	Enterprise Business Processes	60
Two Specialised Modules		

SOLUTIONS DEVELOPMENT OPTION

FULL-TIME	THIRD YEAR	HOURS
ST0280	Cloud & Service Computing	60
ST0318	Solutions Development Project	240
IB3004	Internship Programme	(17 weeks)
One Specialised Module		

SOLUTIONS DEVELOPMENT OPTION

SPECIALISATION MODULES (CHOOSE THREE ONLY)		
Software Design Track		
ST0218	Data Structures & Algorithms	75
ST0316	Advanced Java Programming	60
ST0324	Internet of Things	60
Information Security Track		
ST2501	Network Security	75
ST2514	Digital Forensics and Investigation	60
Interaction Design Track		
ST0293	User Interface Design	60
ST0294	Geospatial Visualisation	60
Free Elective Modules		
ST2510	Independent Study I	60
ST2615	Independent Study II	60

GAME DEVELOPMENT OPTION

FULL-TIME	SECOND YEAR	HOURS
LC0857	Communicating for Professional Effectiveness	30
LC8003	Social Innovation Project	30
LC8004	General Education 3	30
ST0246	Mobile Game Development	60
ST0297	Introduction to Game Development	75
ST0298	Interactive Computer Graphics	90
ST0299	Game Programming using C++	75
ST291Z	3D Level Design & Scripting Studio	150
ST292Z	3D Game Development Studio	150
One Elective Module		
Elective Modules (choose ONE only):		
ST0214	Augmented Reality & Virtual Reality Development	60
ST0218	Data Structures & Algorithms	75
ST0257	Web Applications Development	75
ST2510	Independent Study I	60

GAME DEVELOPMENT OPTION

FULL-TIME	THIRD YEAR	HOURS
ST0276	Ethics and Law of IT & Media	30
ST0320	Game Development Portfolio	240
IB3004	Internship Programme	(17 weeks)
One Elective Module		
Elective Modules (choose ONE only):		
ST0248	Programming for Data Science	60
ST0293	User Interface Design	60
ST0316	Advanced Java Programming	60
ST2615	Independent Study II	60

Diploma in

Music AND Audio Technology

(DMAT)

Music and audio effects are used to enhance the emotional impact of a film, video, game or animation so as to create an enriching experience. In many types of media, such as film, broadcast, animation, or music albums, music plays an integral part in the production. Music can either be created as a complement for various visual media or as an independent product in the form of a recorded song or an advertising jingle.

The 3-year diploma course is designed to provide a holistic music education that imparts components of creativity and technology, with emphasis on the integrated use of music and audio elements. It is unique in that the curriculum is designed with a heavy emphasis on developing the creative capabilities of our students. This has enabled them to function in a variety of existing and emerging media environments.

In addition, the curriculum has been designed to cultivate the entrepreneurial potential of students through creating opportunities for students to showcase and market their skills and services.

COURSEWORK

The course adopts a project-based learning approach. Students' learning take place in small groups through a variety of teaching methods such as lectures, tutorials, presentations, critique sessions, research and practical work. Skills for integrative awareness training and self-exploration are imparted using various theories and techniques to allow for independent work.

A significant amount of time is allocated for studio work to ensure students become competent at applying their skills to meet the commercial requirements. Case studies and study trips are also incorporated to facilitate experiential learning. In addition, the curriculum will facilitate the employability of our graduates by creating avenues and opportunities for them to showcase and market their skills and services.

CAREER PROSPECTS

Mainly serving the digital media and entertainment industry, our graduates can look forward to exciting careers in the established media organisations or companies, such as national broadcasters, cable channels, production houses, advertising agencies and also at live performance venues.

Alternatively, they can seek other opportunities in companies which require music or audio to support their media or business objectives or training institutions. For example, game production companies requiring sound effects for their games and advertising agencies, web enterprises requiring audio to engage their customers.

Fresh Diploma in Music and Audio Technology (DMAT) graduates are typically employed as production assistants. Their main role is to support the production process. Talented graduates may earn the opportunity to direct or lead some of these processes, namely becoming assistant producers.

COURSE STRUCTURE

This course has a combination of year-long and semester-based modules spread across six semesters. The core curriculum covers three distinctive skill domains, namely Musical Skills, Audio Skills and Professional Practices. These three skill domains equip students with the required conceptual, technical and professional skills.

All students are expected to participate in a 17-week internship programme during their third year. Students are required to pass all the modules to be awarded the Diploma in Music and Audio Technology.

FURTHER EDUCATION

DMAT course is recognised by local universities and many reputable foreign universities in Australia, Hong Kong, United Kingdom and the United States. DMAT graduates are granted advanced standing by many universities for admission into the second year or final year of their degree programmes.

Our graduates have also been awarded local and overseas scholarships and studied in local universities and foreign universities, such as NUS, Keele University and Berklee College of Music.

COURSE MODULES

FULL-TIME	FIRST YEAR	HOURS
Year Long		
ST844Z	Music Theory I	120
ST840Z	Synthesis & Composition I	120
ST843Z	Musicianship	135
ST845Z	Production Lab	120
Semester 1		
LC0854	Communicating for Personal & Team Effectiveness	30
LC8001	General Education 1	30
ST8103	Acoustical Science	75
Semester 2		
LC0856	Communicating for Project Effectiveness (Report)	30
LC8002	General Education 2	30
ST8105	Recording & Mixing Techniques I	60

FULL-TIME	SECOND YEAR	HOURS
Year Long		
ST827Z	Performance Practices	90
ST828Z	Recording and Mixing Techniques II	120
ST839Z	Song Writing	90
ST846Z	Production Workshop	180
Semester 1		
LC8003	Social Innovation Project	30
ST8205	Music Theory II	60
ST8207	Synthesis and Composition II	45
Semester 2		
LC8004	General Education 3	30
ST8208	Arranging	45
ST8209	The Business of Music	75

FULL-TIME	THIRD YEAR	HOURS
Stage 3A		
ST8304	Audio Post-Production	60
ST8305	Portfolio Development	90
ST8307	Scoring for Visuals	60
ST8310	Interactive Audio	60
Stage 3B		
IB3006	Internship Programme	(17 weeks)
Electives in Third Year (Choose 1 only)		
ST8308	Show Production	75
ST8309	Ensemble Lab	75

Diploma in

Visual Effects AND Motion Graphics (DVEMG)

It's been said that Hollywood may still be where the world's biggest movies are made, but thanks to the visual-effects companies like Lucasfilm (ILM Singapore) and Infinite Studios, Singapore is fast becoming an Asian hub for ILM Singapore's back-room operations. Since then, Singapore-based teams have worked on visual effects for blockbusters such as The Bourne Legacy, Captain America and Iron Man 2 to name a few.

Visual Effects and Motion Graphics are part of what makes movies and TV magical. These highly skilled professionals manipulate video by adding animation, graphics and special effects that ordinarily could not be staged in real life. The Diploma in Visual Effects and Motion Graphics (DVEMG) is designed to emphasise motion graphics and visual effects compositing by providing skills drawn from the various fields of photography, graphic design, compositing, video, and animation.

Experience real life projects such as Halloween Night at Sentosa, Youth Model ASEAN Conference (YMAC), World Solar Car Challenge and interesting music videos. Home-based M.A.D. (Media-Art-Design) studios are built to simulate design studio environments to prepare students for their careers ahead. The course will also create opportunities to connect with renowned International VEFX companies [Disney Singapore and LucasFilm (ILM)] through mentorship, recruitment talks and projects.

COURSE MODULES

FULL-TIME	FIRST YEAR	HOURS
General Education		
LC8001	General Education 1	30
LC8002	General Education 2	30
Year Long		
ST611Z	Graphic Design Principles	120
ST612Z	3D Fundamentals	120
Semester 1		
ST6112	Drawing	90
ST6404	Creative Storytelling	30
ST6403	Digital Photography	60
ST6406	Media Theory	30
Semester 2		
ST6203	Video & Audio Fundamentals	60
ST6405	Pre-Viz & Storyboarding	75
ST6407	Motion Analysis & Techniques	60
ST6408	Compositing Fundamentals	45

FULL-TIME	SECOND YEAR	HOURS
General Education		
LC8003	Social Innovation Project	30
LC8004	General Education 3	30
Year Long		
ST656Z	Digital Compositing	120
Semester 1		
LC0857	Communicating for Professional Effectiveness	30
ST6501	Effects Animation	90
ST6504	Digital Matte Painting & Layout	60
ST6508	Dynamic Typography	45
ST6509	3D for Visual Effects	60
Semester 2		
ST6505	Special Effects	60
ST6506	Motion Capture	60
ST6510	Broadcast Design	60
ST6511	Media Business	30
ST6512	Production for Visual Effects	135

FULL-TIME	THIRD YEAR	HOURS
Stage 3A		
ST6601	Advance Matchmoving Techniques	90
ST6603	Visual Effects Studio	195
Stage 3B		
IB3005	Internship Programme	(17 weeks)
Electives in Third Year		
ST6230	3D Animation	60
ST6604	Independent Study	60

COURSEWORK

Classes are conducted in our Media-Art-Design studios which are all built to mimic a studio environment. In addition, students get to experience out-of-classroom learning and participate in overseas activities such as study trips, immersion programmes, internships, as well as competitions that will nurture a student's global mindset, and extending their industry experience and network.

CAREER PROSPECTS

Graduates can look forward to an exciting career in a fast-growing media industry. Career paths include Compositor, Digital Artist, Digital Matte/Texture Painter, Modeller, Motion Graphics Designer, Effects Animator, Rotoscoping Specialist, Matchmoving/Tracking Artist, and Motion Capture Artist.

FURTHER STUDIES

Many universities grant advanced standing to DVEMG graduates and admit them directly into the second year of a three-year degree programme.

COURSE STRUCTURE

To qualify for the Diploma in Visual Effects and Motion Graphics (DVEMG), a student must pass all the core modules and required elective modules. The curriculum covers three distinctive skills domains, namely Design and Concept Art, Visual Effects and Motion Graphics, and Production and Professional Practice.

a) Design and Concept Art

Students will learn art and design fundamentals such as drawing, painting, and photography in their historical and stylistic context. Students will be taught to recognise various design elements and principles, and how they influence design decisions. Students will be expected to translate their ideas into functional designs.

b) Visual Effects and Motion Graphics

Students learn 3D modelling and texturing and lighting used in the production of 3D objects and environments. Students get to apply their skills through creating props and virtual sets that enhance visual storytelling. Students will also develop a keen understanding of pre-production requirements that are necessary to integrate computer generated elements with live action. 3D technology associated with camera matching is emphasised to enable students to achieve complex effects commonly used in the industry. Motion Graphics extrapolate a student's ability in static design and focuses on the design of movement. Students will spend hours researching and designing style frames, creating design boards before animating them. Students will learn to simulate real life movement and learning through critique and feedback is a large part of our teaching methods.

c) Production and Professional Practice

A holistic education in the complete production pipeline approach in visual effects and motion graphics includes the student's ability to function as a professional in a commercial setting. The visual effects and motion graphics designer are required to be passionate, a team player, able to work independently and aware of his ethical and legal obligations towards clients and the community.

DIPLOMA (CONVERSION) IN **DIGITAL MEDIA CREATION** (NVDMC)

(PART-TIME)

For more information on Part-Time Diploma Courses, you may refer to **www.pace.sp.edu.sg**

DIPLOMA (CONVERSION) IN **WEB AND PROGRAMMING**

(NVWP)
(PART-TIME)

For more information on Part-Time Diploma Courses, you may refer to **www.pace.sp.edu.sg**

SPECIALIST DIPLOMA IN **Data Science**

(SDDS)
(PART-TIME)

This is a one-year part-time course that provides training in the increasingly important areas of data science and analytics.

Students are awarded the Specialist Diploma in Data Science after successfully completing two post-diploma certificates (PDCs) in one of the following possible progressions.

SPECIALIST DIPLOMA IN **Data Science (Data Analytics)**

(SDDS (DA)) (PART-TIME)

Offered by the School of Mathematics and Science. Please see page 213 for more information.

SPECIALIST DIPLOMA IN **Data Science (Predictive Analytics)**

(SDDS (PA)) (PART-TIME)

Offered by the School of Mathematics and Science. Please see page 213 for more information.

SPECIALIST DIPLOMA IN **Data Science (Artificial Intelligence)**

(SDDS (AI)) (PART-TIME)

For more information on Part-Time Diploma Courses, you may refer to **www.pace.sp.edu.sg**

SPECIALIST DIPLOMA IN **Data Science (BIG DATA & STREAMING ANALYTICS)**

(SDDS (BDSA))
(PART-TIME)

For more information on Part-Time Diploma Courses, you may refer to **www.pace.sp.edu.sg**

SPECIALIST DIPLOMA IN **DIGITAL MARKETING AND ANALYTICS**

(NSDMA)
(PART-TIME)

For more information on Part-Time Diploma Courses, you may refer to **www.pace.sp.edu.sg**

SPECIALIST DIPLOMA IN **FULL STACK WEB DEVELOPMENT**

(NSFSWD)
(PART-TIME)

For more information on Part-Time Diploma Courses, you may refer to **www.pace.sp.edu.sg**

SPECIALIST DIPLOMA IN **MOBILE APPS DEVELOPMENT**

(NSMAP)
(PART-TIME)

For more information on Part-Time Diploma Courses, you may refer to **www.pace.sp.edu.sg**

SPECIALIST DIPLOMA IN **CYBER SECURITY MANAGEMENT**

(NSCSM)
(PART-TIME)

For more information on Part-Time Diploma Courses, you may refer to **www.pace.sp.edu.sg**

SPECIALIST DIPLOMA IN **CYBER SECURITY**

(NSCYS)
(Earn and Learn Programme)
(PART-TIME)

For more information on Part-Time Diploma Courses, you may refer to **www.pace.sp.edu.sg**

FACILITIES

DRAWING STUDIO

The Drawing Studio is where our digital media students learn the traditional aspect of the arts. It is within the confines of this studio where classes such as still-life drawing, figure drawing and anatomy studies are conducted. The spacious room is also equipped with large mirrors which help facilitate acting lessons for our animation students. The studio is specially designed to provide a conducive and creative space that allows both experimentation and artistic expression.

MUSIC TECHNOLOGY CENTRE

The Music Technology Centre comprises of five labs, specially designed for the learning of music and audio technology subjects. Each lab is acoustically treated and contains at least 23 music synthesiser keyboards. All the keyboards are connected to the main sound system, boasting of a high quality Mackie 24 channel analogue mixer and professional loudspeakers.

Students seated at each workstation will be able to connect their laptops via a convenient USB connection, that enables them to use the keyboard synthesisers as a controller. Additionally, the sound system allows students to hear their keyboard performances or works with pristine quality.

A variety of lesson formats can be conducted in these labs. They range from lectures, tutorials, practical sessions, ensemble performances, group discussions and project work.

Each lab is equipped with a high-quality projector that allows media content to be viewed from different corners of the lab.

MUSIC & AUDIO PRODUCTION SUITE

The Music & Audio Production Studio Suite occupies up to 2,000 sq ft of studio area. Each suite is fully equipped with an acoustically- designed recording studio and a surround sound-enabled control room. The recording space features a Yamaha grand piano, various synthesisers and instrument amplifiers. The control rooms are equipped with professional industry standard equipment, including the most advanced Digital Audio Workstation (DAW), the Avid Protools HDX.

These recording studios are capable of producing audio for various media content such as movies, video, games, animation, while providing an inspirational place to compose and arrange music.

REHEARSAL ROOMS

The rehearsal tower is made up of several rooms built specially for musical ensembles and band practices.

Each room is acoustically-treated, and comes complete with instruments and sound system, that allows students a place to rehearse and practise.

VISUAL EFFECTS STUDIO

The Visual Effects Studio allows students to produce moving imagery in a controlled setting. This sound-proof shooting floor is ideal for chroma-keying, video production works, sound recording and multi-camera training.

The Visual Effects Studio comprises of a green screen cyclorama with a curtain rail that provides both blue and black backdrop options. It also has a full-length Chromatte backdrop by Reflecmedia, used by professional movie studios for chroma-keying. The Ultimatte DV Live Keyer combined with a Lite Ring attached to a camera allows real time compositing which can be used for live recording of programmes with virtual sets.

The studio also comes with a two daisy-chained lighting grid with a dimmer control panels and a teleprompter. Further to that, there is also the Glide Cam Crane and Jimmy Jib that allows for creative shots to be done in and out of the studio.

MOTION CAPTURE STUDIO

The Motion Capture Studio allows students to capture full body and facial movements simultaneously using various industry and emerging motion capture systems. The Vicon 12 camera Bonita/Blade system enables captured motion to be viewed in real-time and allows the user to ensure that the captured sequences are as required even before post processing. Two mocap suits complete with hats, gloves, markers and shoes are in the studio for students to work on.

Other wireless motion capture options includes the Perception Neuron, which is one of the world's smallest full-functioned 9-axis sensors with on-board calculation and calibration capabilities, and Kinect v2 with Brekel full body capture system, to capture motion without the need for a suit or markers.

POST-PRODUCTION STUDIOS WITH TWO WHISPERROOMS

The Post-Production Studios are equipped with the latest Mac Pro Two 2.26 GHz Quad-Core Intel Xeon and high-end Windows workstations to support the tough and demanding requirements of visual effects and motion graphics projects. Each workstation is equipped with software applications that are widely used in the industry and comes with it's own reference monitor.

The Two WhisperRooms were also built within the two classroom studios to enable audio recording in a noisy environment and provide students with sensitive and classified projects to be done there.

M.A.D. STUDIOS

The M.A.D. (Media-Art-Design) Studios is a fully-equipped set of production studios with a personal touch. An integral part of the Creative Hub, it is divided into exclusive Home-based Studios where each student will have their own personalised workspace and dedicated access.

The M.A.D. Workshop is where our students will get creative during sculpting, production design and traditional animation classes. M.A.D. Studios is a cosy place where they can relax and have creative discussions with peers or industry clients from cross disciplinary or collaborative projects. The M.A.D. Studios truly simulates the real-world environment.

CYBER WARGAME CENTRE

A dedicated learning space to give our students a taste of the real experience of an infocomm security professional. It consists of several labs set up for different purposes, such as launching attacks, setting up network defences, conducting digital forensics investigation on crime scenes and performing malware analysis.

The learning space permits creating of different scenarios in the Blue team Vs Red team Cyber Wargame format. Students can look forward to pitting their skills against fellow classmates and hone their individual crafts in defending networks, launching offensive attacks and investigating cyber security incidents.

WIRELESS INNOVATION LAB

The Wireless InnovaTion Lab is designed for the delivery of modules on the Internet of Things (IoT) and wireless networking. A showcase area features projects and latest technology related to IoT and wireless networking.

Movable and height-adjustable tables allow the lab to be configured easily for different uses – as an open white space or for different seating and groupings.

APERTURE SCIENCE

Designed for the game developer by the game developer, the Aperture Science lab features ergonomic workspaces equipped with high-performance workstations for game development.

An exclusive mini-studio allows students to work on projects utilizing the latest technologies such as augmented reality and virtual reality.

SOCIAL MEDIA LISTENING CENTRE

The Social Media Listening Centre provides our students with an authentic experience in listening, monitoring and analysing the sentiments and buzz on social media in channels such as forums, blogs, micro-blogs, Q&A, news and social networking sites. Students will work with Social Media Listening tools such as Social Express from iSentia Brandtology.


SP
Engineering
AERONAUTICAL ENGINEERING
AEROSPACE ELECTRONICS
BIOENGINEERING
COMMON ENGINEERING PROGRAMME
COMPUTER ENGINEERING
ELECTRICAL & ELECTRONIC ENGINEERING
ENERGY SYSTEMS & MANAGEMENT
ENGINEERING WITH BUSINESS
ENGINEERING SYSTEMS
MECHANICAL ENGINEERING
MECHATRONICS & ROBOTICS
With SP, it's So Possible
SP SCHOOL OF ELECTRICAL & ELECTRONIC ENGINEERING
SP SCHOOL OF MECHANICAL & AERONAUTICAL ENGINEERING

SP's School of Electrical & Electronic Engineering (EEE) offers courses at the diploma, specialist diploma, and advanced diploma levels. It has approximately 3,000 students and close to 160 academic staff, comprising both local and expatriate staff with good credentials.

DIPLOMA COURSES

- Diploma in Aerospace Electronics (DASE)
- Diploma in Energy Systems and Management (DESM)
- Diploma in Computer Engineering (DCPE)
- Diploma in Electrical and Electronic Engineering (DEEE)
- Diploma in Engineering with Business (DEB) (Jointly offered with the SP Business School and the School of Mechanical & Aeronautical Engineering)
- Diploma in Engineering Systems (DES)
- Common Engineering Programme (DCEP) (Jointly offered with the School of Mechanical & Aeronautical Engineering)

PRACTICAL TRAINING

Students and staff at the School of EEE have access to some of the best and most up-to-date facilities for training and development, with numerous general-purpose and specialised laboratories.

The school is also active in R&D activities in technological areas such as Broadband Communications, Digital Signal Processing, Robotics and Intelligent Control, Renewable Energy, Industrial Automation & Control Technology, and IC Design.

The various R&D centres that have been set up include:

- Technology Centre for Aerospace Electronics
- Technology Centre for Clean Energy
- Technology Centre for Digital Signal Processing
- Technology Centre for IC Design & Nanofabrication
- Technology Centre for Singapore Robotic Games
- Technology Centre for Wireless Communication
- Centre for Broadband Technology
- Centre for Automation, Robotics & Control
- Centre for Embedded System Applications
- Centre for Network Operations

Students of the school have consistently performed outstandingly at both national and international competitions such as the Singapore Robotics Games, WorldSkills Competition and Robot World Cup Soccer, attesting to the high quality of training that the School of EEE provides.

Engineering Academy Programme

If you get excited about technology and want to make things happen, then the Engineering Academy Programme is for you! It is an alternative curriculum made available to a limited number of students from the following courses:

- Diploma in Aerospace Electronics (from Year 1, Semester 1)
- Diploma in Computer Engineering (from Year 1, Semester 1)
- Diploma in Engineering with Business (from Year 1, Semester 1)
- Diploma in Electrical and Electronic Engineering (from Year 1, Semester 1)
- Diploma in Energy Systems and Management (from Year 1, Semester 1)
- Diploma in Engineering Systems (from Year 2)

In the Engineering Academy Programme, you will be exposed to an exciting and intensive experience where you learn to develop workable solutions to real world problems. That means: figuring out the right questions to ask, taking charge of your own learning and working through uncertainty. You will also collaborate with peers from other Engineering diplomas, learn about Design and Business, be able to prototype quickly and have opportunities to work closely with industry and university partners.

** All full-time diploma students are required to take two compulsory Education and Career Guidance Modules in SP. Students will take SP101A: Education and Career Guidance 1 – Personal Development (15 hours) in their first year. In their second or third year, students will take SP201A: Education and Career Guidance 2 – Career Development (30 hours).*

** All students are required to take one compulsory Sports for Life (SFL) module for one semester in their first year in SP. In their second and third year, students may sign up for SFL module as an elective.*

Diploma in

Aerospace Electronics

(DASE)

The Diploma in Aerospace Electronics (DASE) course aims to provide students with a broad-based engineering foundation to support a wide spectrum of activities in the maintenance, repair and overhaul of Aircraft Electrical, Instrument, Navigation and Communication Systems.

Specifically, students will be able to:

- Understand the working principles and experience the operation of Aircraft Electrical, Instrument, Navigation and Communication Systems,
- Develop flight control, navigation, and communication systems for aerospace projects,
- Understand human factors to manage errors in the working environment,
- Develop professional and social responsibilities, good work attitudes, leadership and team-working skills.
- Acquire analytical and problem-solving skills,
- Communicate effectively on technical and management matters.

Students can also take up any of the following programmes depending on their interest and eligibility:

- Engineering Academy Programme
- Internship Programme
- Advanced Modules
- Commercial Pilot Theory Program

ENGINEERING ACADEMY PROGRAMME

In the first semester of Year 1, students can choose to join the Engineering Academy Programme which is an alternative curriculum designed to develop students to be engineers with creative confidence, comfortable with uncertainty, having a growth mind-set and self-driven learners.

INTERNSHIP PROGRAMME

Besides the Engineering Academy Programme, students are able to choose another curriculum in Year 3 that offers a 22-week Internship Programme in the aerospace industry, or 12-week Internship Programme together with a Final Year Project. The internship will expose students to applied learning to acquire skills and knowledge in an authentic working environment.

COMMERCIAL PILOT THEORY PROGRAMME

During the three-year course, DASE students will have the option to attend a concurrent 10-week course in 'Commercial Pilot Theory'. The course provides a comprehensive insight into Flight Planning, Aviation Navigation, Radio Aids, Flight Instruments, Theory and Practical of Meteorology and the experience of flying a flight simulator. Participants will be equipped with knowledge for a career in the aviation industry and will be ready to sit for the Civil Aviation Authority of Singapore's (CAAS) theory examinations (Navigation Group) for the issue of Commercial Pilot's License. The course is conducted by qualified and experienced pilot trainers.

ADVANCED MODULES

Students will be given the option of taking up to four advanced modules during their three-year course. These modules are designed to add greater depth of knowledge in key areas that will be useful for students who seek to pursue their university studies. The advanced modules offered are:

- Advanced Mathematics I
- Advanced Mathematics II
- Advanced Mathematics III
- Further Mathematics
- Physics

ASSESSMENT

Assessment during each year of the diploma course will be by means of in-course assessments, practical tests and semestral examinations.

SCHOLARSHIPS

Ample prestigious scholarships from SP and aerospace organisations are available for application by outstanding students.

CAREER PROSPECTS

As the aerospace industry is expanding at a rapid rate, graduates of this course will be well-positioned for employment in aerospace companies and the Republic Singapore Air Force for jobs such as Aircraft Maintenance Engineer, Aerospace Engineering Officer, Flight simulator Engineer, and Aerospace Sales and Marketing Associate Engineer. During the three-year course, students will be able to sit for the Basic Examinations under the Singapore Airworthiness Requirements (SAR) 66 for licensing of Aircraft Maintenance Engineers conducted by the Civil Aviation Authority of Singapore (CAAS). With the creation of 10,000 jobs by Seletar Aerospace Park by 2018, the career prospects of graduates is bright.

FURTHER STUDIES

Graduates can gain direct entry into Year 2 or Year 3 of Aerospace Engineering, Electrical & Electronic Engineering or Computer Engineering degree courses in local and overseas universities.

The Singapore Institute of Technology (SIT) and University of Glasgow have accredited the DASE course for graduates to be able to complete their 'Bachelor of Engineering (Honours) in Aerospace Systems' or 'Bachelor of Engineering (Honours) in Aeronautical Engineering' degree programmes in two years. Singapore University of Social Sciences (SUSS) offers DASE graduates an accelerated part-time training path leading to a Bachelor of Engineering Aerospace Systems.

COURSE MODULES

FULL-TIME	FIRST YEAR	HOURS
ET0083	Structured Programming	60
ET0085	Computer Aided Design & Drafting (CADD)	30
ET0730	Network Fundamentals	30
ET1003	Digital Electronics I	60
ET1004	Digital Electronics II	60
ET1005	Principles of Electrical & Electronic Engineering I	60
ET1006	Principles of Electrical & Electronic Engineering II	90
ET1011	Introduction to Engineering I	60
ET1012	Introduction to Engineering II	30
LC0354	Communicating for Personal and Team Effectiveness	30
LC8001	General Education 1	30
LC8002	General Education 2	30
MS4120	Basic Mathematics	60
MS4121	Engineering Mathematics I	60

FULL-TIME	SECOND YEAR	HOURS
ET0053	Circuit Theory & Analysis	75
ET0087	Analog Communication Systems	75
ET0423	Aircraft Electrical Fundamentals	75
ET0429	Aircraft Servomechanisms & Electronics	75
ET1010	Microcontroller Applications	90
LC8003	Social Innovation Project	30
LC8004	General Education 3	30
LC0356	Communicating for Project Effectiveness (Report)	30
LC0357	Communicating for Professional Effectiveness	30
ME0501	Aeronautical Engineering Science	60
MS4205	Engineering Mathematics II (A)	60
MS4206	Engineering Mathematics II (B)	60

FULL-TIME	THIRD YEAR	HOURS
ET0424	Aircraft Radio & Optical Communications	75
ET0425	Aircraft Instrument Systems	60
ET0426	Aircraft Communication & Navigation Systems	75
ET0427	Aircraft Automatic Flight & Electronic Systems	75
ET0428	Aircraft Electrical Systems	75
ET0433	Human Factors	60
IC4001	Internship Programme	22 weeks
OR		
IA4001	Internship Programme	12 weeks
ET102Y/Z	Final Year Project	150

Diploma in

Computer Engineering

(DCPE)

The Computing and IT sector is a fast-growing area in Singapore. Singapore has always been at the forefront in the design, development and implementation of computers, networks and digital systems. Its world-class network infrastructure and IT base allows one to communicate, use and develop areas of computing technologies on par with the rest of the world. With the fast growth in Cloud Computing and the 'Internet of Things' (IoT), there will be huge demand for computer engineers who can innovate, develop and implement advanced computing systems.

Computer Engineering is a discipline about the hardware and software aspects of computer science. Computers are inarguably at the heart of many modern and high-tech systems, for example robotics, medical instruments, public transportation systems and weapon systems. Digital devices and systems are becoming smarter because of computers.

The Diploma in Computer Engineering (DCPE) course aims to train technologists who can design, develop, maintain and implement computer systems and applications.

The course has been designed for broad coverage of computing and networking technologies. Students can select the area of expertise in Computer Engineering to grow their interests and deepen their knowledge. By concentrating on a group of closely related modules, students can follow their interests and steer their path towards a successful career in the computing sector.

FIRST YEAR

The DCPE course follows a common first year of study with most of the other engineering diploma courses in the School of Electrical & Electronic Engineering. Students are provided with the necessary foundation in Electrical & Electronic Engineering, Computer Programming and Mathematics.

SECOND YEAR

Students learn more advanced computer engineering subjects. They will make a choice between two paths based on their interest, career plan and strength:

- Computer Engineering & Software (CES)
- Computer Networking & Security (CNS)

The CES path emphasises on computer hardware interfacing and software programming. Students will learn about microcontroller applications, computer interfacing, mobile apps development, and server-side programming.

The CNS path concentrates on computer networking and security. Students will study a broad range of computer networking topics in infrastructure design, LANs and WAN implementations, TCP/IP, wired and wireless network implementation.

THIRD YEAR

In the final year of study, DCPE students further enhance their knowledge in computer hardware, digital technologies for Smart Cities, cloud computing, cyber security, broadband communications and services, and server administration through the various options offered to them. Students are free to choose any one Year-3 option from four specialisation areas available under the CES or CNS path. Each option comprises four highly specialised modules closely following the industry trends.

The four Year 3 options offered to students on the CES path are:

- Computer Applications
- Computer Networking
- Smart City Technologies
- Cloud Systems

The four Year 3 options offered to students on the CNS path are:

- Cloud Systems
- Cyber Security
- InfoComm Technologies
- Network System Administration

OPTIONS

For either the CES or CNS path, there are four options offered during Year 3 of the DCPE course. Each option will lead to a specialisation in an important area in the computer industry. The options offered are:

- **Computer Applications (for CES only)**
  This option covers computer operating systems, advanced programming techniques and applications with microcontrollers, embedded systems and microprocessor systems.

- **Computer Networking (for CES only)**
  Students will study a broad range of computer networking topics in infrastructure design, LANs and WAN implementations, TCP/IP, wired and wireless network implementation and network management.

- **Smart City Technologies (for CES only)**
  Students will study a group of modules that cover Internet of Things (IoT) solutions design; data analytics; wireless technologies and IoT security. The technologies covered by these modules are key to the design and operation of smart cities and smart homes.

- **Cyber Security (for CNS only)**
  Topics covered include authentication protocols, cryptography techniques, internet security and firewalls. Students will be trained in protecting computer networks from malicious network attacks.

- **Cloud Systems (for both CES and CNS)**
  Students are introduced to cloud computing and the technologies and framework that support it. DCPE students will have the luxury of experimenting with our own Cloud Centre (the only one of its kind in Singapore), through which they will learn about the implementation of virtualisation, the control of cloud applications, management of data centres and energy conservation using green IT.

- **InfoComm Technologies (for CNS only)**
  Students will study topics on various broadband technologies (e.g. xDSL, FTTH, MPLS) and services (e.g. Voice over IP, IPTV), and generations of mobile communication networks (2G, 3G, 4G).

- **Network System Administration (for CNS only)**
  Students will study the content from two world-recognised industrial certifications: Cisco Certified Network Associate (CCNA) and Red Hat Certified System Administrator (RHCSA). At the end of the semester, students can opt for the two certification tests.

ENGINEERING ACADEMY PROGRAMME

Outstanding DCPE students are eligible for the Engineering Academy Programme, in which the students will go through an alternative curriculum designed to develop students to be engineers with creative confidence, comfortable with uncertainty, a growth mind-set and are self-driven learners.

INTERNSHIP OR FINAL YEAR PROJECT

DCPE students will go for a 22-week Internship Programme in Year 3. The Internship Programme will provide students with invaluable authentic industrial learning experience in the computer engineering industry. DCPE students may also opt for “12-week Internship + Final Year Project” instead of 22-week Internship.

ADVANCED MODULES

Students will be given the option of taking up to four advanced modules during their three-year course. These modules are designed to add greater depth of knowledge in key areas that will be useful for students who seek to pursue their university studies. The advanced modules offered are:

- Advanced Mathematics I
- Advanced Mathematics II
- Advanced Mathematics III
- Further Mathematics
- Physics

ASSESSMENTS

Assessment during each year of the diploma course will be by means of in-course assessments, practical tests and semestral examinations. Students will participate in collaborative projects implemented as project-based independent learning assignments, training them to look beyond their scope of studies.

SCHOLARSHIPS

Ample prestigious scholarships from SP are available for application by outstanding DCPE students.

CAREER PROSPECTS

There is a great demand for computer engineering personnel not only in the Information Technology sectors, but also in all industries, businesses and establishments. DCPE graduates will be able to develop careers as Associate Computer Engineers, Software/Mobile Applications Developers, Network Engineer, Network/System Administrator, Cloud Systems/Data Centre Administrator or Cyber Security Specialist. Those graduates with industrial certification can expect very attractive remuneration packages. There are ample career opportunities for DCPE graduates due to their ability to design, install, manage and maintain computer and digital systems. They will play a key role in bringing Singapore forward as a global hub for Info-Communication Services.

FURTHER STUDIES

The prospects for further studies are great for DCPE graduates. They can choose to pursue a degree in Computer Science, Computer Engineering, Info-Communication Engineering or Electrical & Electronic Engineering. Graduates may gain direct entry into the Year 2 or Year 3 of degree courses in local and overseas universities.

COURSE MODULES

FULL-TIME	FIRST YEAR	HOURS
ET0083	Structured Programming	60
ET0085	Computer-Aided Design & Drafting (CADD)	30
ET0730	Network Fundamentals	30
ET1003	Digital Electronics I	60
ET1004	Digital Electronics II	60
ET1005	Principles of Electrical & Electronic Engineering I	60
ET1006	Principles of Electrical & Electronic Engineering II	90
ET1011	Introduction to Engineering I	60
ET1012	Introduction to Engineering II	45
LC0354	Communicating for Personal and Team Effectiveness	30
LC8001	General Education 1	30
LC8002	General Education 2	30
MS4120	Basic Mathematics	60
MS4121	Engineering Mathematics I	60

FULL-TIME	SECOND YEAR	HOURS
ET0015	Server Management	75
LC0356	Communicating for Project Effectiveness (Report)	30
LC0357	Communicating for Professional Effectiveness	30
LC8003	Social Innovation Project	30
LC8004	General Education 3	30
MS4205	Engineering Mathematics II (A)	60
MS4206	Engineering Mathematics II (B)	60
	Year-2 Path-specific Module 1	
	Year-2 Path-specific Module 2	
	Year-2 Path-specific Module 3	
	Year-2 Path-specific Module 4	
	Year-2 Path-specific Module 5	

YEAR 2 PATHS (CHOOSE 1)		HOURS
Computer Engineering & Software (CES) Path		
ET1010	Microcontroller Applications	90
ET0011	Computer Interfacing	75
ET0525	Mobile Applications Development	75
ET0702	Data Structures & Algorithms	75
ET0721	Client-server Applications Development	75
Computer Networking & Security (CNS) Path		
ET0521	Network Vulnerabilities & Security Tools	90
ET0010	Computer Networking	75
ET0716	LAN Switching & Wireless	75
ET0718	Wide Area Networks	60
ET0030	TCP/IP	60

FULL-TIME	THIRD YEAR	HOURS
IC4001	Internship Programme	22 weeks
OR		
IA4001	Internship Programme	12 weeks
ET102Y/Z	Final Year Project (bundled with IA4001)	150
	Year 3 Option Module 1	75
	Year 3 Option Module 2	75
	Year 3 Option Module 3	60
	Year 3 Option Module 4	60
	Technical Module (Year-3 option dependent)	75

YEAR 3 OPTIONS (CHOOSE 1)		HOURS
Computer Applications (for CES path only)		
ET0706	Object Oriented Programming	75
ET0708	Microprocessor Systems & Programming	75
ET0104	Embedded Computer Systems	60
ET0720	Advanced Microcontroller Technology	60
Computer Networking (for CES path only)		
ET0010	Computer Networking	75
ET0716	LAN Switching & Wireless	75
ET0030	TCP/IP	60
ET0718	Wide Area Networks	60
Smart City Technologies (for CES path only)		
ET0731	Internet of Things Security	90
ET1205	Wireless Technology Applications	60
ET1408	Smart City Systems Design	60
ET1409	Data Analytics	60
Cloud Systems (for both CES and CNS paths)		
ET0023	Operating Systems	75
ET0714	Data Centre Management	75
ET0719	System Virtualization	60
ET0722	Cloud Computing Services	60
Cyber Security (for CNS path only)		
ET0522	Network Security Systems	75
ET0531	Firewall Technologies	75
ET0709	Network Analysis & Forensics	60
ET0715	Internet Security	60
InfoComm Technologies (for CNS path only)		
ET0026	Network Management	75
ET0723	Mobile Communications	75
ET0141	Broadband Communications	60
ET0532	IP Multimedia Services	60
Network System Administration (for CNS path only)		
ET0727	CCNA Studies	90
ET0728	Linux Essentials	90
ET0729	Linux System Administration	90
Technical Module (Year-3 option dependent, prescribed)		
ET0023	Operating Systems	75
ET0026	Network Management	75
ET0706	Object Oriented Programming	75
ET0732	Machine Learning & Artificial Intelligence	60

Diploma in

Electrical AND Electronic Engineering

(DEEE)

The Diploma in Electrical and Electronic Engineering (DEEE) course aims to produce competent technologists who are capable of working in a wide range of electrical and electronic engineering industries. It will equip students with Design Thinking skills to enable them to effectively conceive new products and services. The course is designed to impart sufficient breadth of electrical and electronic engineering knowledge while allowing students great flexibility in choosing their preferred specialisations. Electrical and electronic engineering is the broadest and most dynamic course which covers everything, from the making of the semiconductor chips for your smartphone to the handling of cutting-edge healthcare equipment and finally to the huge power generation plants. This is a major sector in Singapore's economy.

The key advantage of this course is its flexibility. It offers several option paths for students to choose and customise their curriculum according to individual interests and abilities. It also offers students the chance to take additional advanced modules that will give them an edge when they progress to university.

The DEEE course is taught using the Conceive-Design-Implement-Operate (CDIO) framework. This framework, which is used in several top universities in the United States, Europe and Australia, ensures that students are trained to possess critical thinking, process and life skills. It also ensures that students are given ample opportunities to design and build projects that will enhance the understanding of key concepts taught.

FIRST YEAR

Students are provided with the necessary foundation in Electrical and Electronic Engineering, Project Fabrication skills, Programming and Mathematics.

SECOND YEAR

Students will choose to specialise in any two technical options out of the following four:

- Aerospace Engineering Option
- Biomedical Engineering Option
- Electrical Engineering Option
- Electronic Engineering Option

THIRD YEAR

Students will specialise in one of the seven double-specialisation tracks offered. Each track allows students to either study their choice of specialisation in greater depth, or to add breadth to their studies. Certain tracks require second year prerequisites while others like Microelectronics + Nanoelectronics and Microelectronics + Robotics & Control tracks do not. Students will be provided with course counselling at appropriate times. The seven double-specialisation tracks include:

- Aerospace + Communications
- Biomedical + Robotics & Control
- Computer + Communication
- Microelectronics + Nanoelectronics
- Microelectronics + Robotics & Control
- Power + Control
- Rapid Transit Technology + Communication

Students will attend lectures, tutorials, practical computer sessions and laboratory, as well as project sessions throughout the three years of study. In their final year, students can either go for a 12-week internship and do a final year project or go for a 22-week internship.

INTERNSHIPS

DEEE students will go for either a 12-week or a 22-week internship in Year 3. The internship can be carried out either locally or overseas. The internship will expose the students to invaluable authentic industrial learning experience in the electrical and electronic industry and for those who opt for overseas training, an opportunity to experience a different culture.

ENGINEERING ACADEMY PROGRAMME

Are you looking to challenge yourself? The Engineering Academy Programme is a new pathway available to a limited number of engineering students from the School Mechanical & Aeronautical Engineering (MAE) and School of Electrical & Electronic Engineering (EEE).

Outstanding DEEE students are eligible for the Engineering Academy Programme in Year 1. Under this programme, students will go through an alternative curriculum designed to develop them to be engineers with creative confidence, comfortable with uncertainty, a growth mind-set and are self driven learners.

If you are selected for the Engineering Academy Programme, you will be exposed to an exciting and intensive experience where you learn to build workable solutions to real world problems. That means, figuring out the right questions to ask, taking charge of your own learning, working through uncertainty and being comfortable with having to try and try again. At the Engineering Academy Programme, you will be placed in an environment where innovation happens. You will collaborate with peers from other Engineering diplomas, learn about Design and Business, prototype quickly and have opportunities to work closely with industry and university partners.

ADVANCED MODULES

Students will be given the option of taking up to four advanced modules during their three-year course. These modules are designed to add greater depth of knowledge in key areas that will be useful for students who seek to pursue their university studies. The advanced modules offered are:

- Advanced Mathematics I
- Advanced Mathematics II
- Advanced Mathematics III
- Further Mathematics
- Physics

ASSESSMENT

Assessment during each year of the diploma course will be by means of in-course assessments, practical tests and semestral examinations.

CAREER PROSPECTS

Graduates can find employment in a wide range of the industrial sectors covering Aerospace, Biomedical, Communications, Computer, Electrical, Control, and Microelectronics Engineering. Students can work as an Assistant Electrical Engineer, Assistant Electronics Engineer, Aircraft Maintenance Engineer, Assistant Project Engineer, Assistant Test Engineer, Assistant Process Engineer, Assistant Quality Engineer, Biomedical Equipment Service Engineer, Field Service Associate Engineer, IT Support Engineer, Maintenance Associate Engineer, Material Planner, Technical Officer (Control & Instrumentation) or Technical Officer (Power Distribution System). Your diploma is recognised by the Energy Market Authority (EMA) for the application of an Electrical Technician License if you seek to specialise in Power + Control. You will have a competitive advantage at the SAR66 examinations conducted by the Civil Aviation Authority of Singapore for the Licensing of Aircraft Maintenance Engineers if you take a specialisation in Aerospace + Communication.

FURTHER STUDIES

Graduates with good results will be eligible for admission to the second year of the Electrical and Electronic Engineering course at the Nanyang Technological University (NTU) or gain about one year's worth of exemptions at the National University of Singapore (NUS). The Singapore University of Technology and Design (SUTD) will also admit DEEE graduates into their programmes. In addition, almost all universities in United Kingdom and Australia accept qualified DEEE graduates directly into the second year of a three-year degree programme, or directly into the third year of a four-year degree programme. Our graduates have also gained entry into reputable universities in Canada, New Zealand and the United States.

COURSE MODULES

FULL-TIME	FIRST YEAR	HOURS
ET0083	Structured Programming	60
ET0085	Computer Aided Design & Drafting (CADD)	30
ET0730	Network Fundamentals	30
ET1003	Digital Electronics I	60
ET1004	Digital Electronics II	60
ET1005	Principles of Electrical & Electronic Engineering I	60
ET1006	Principles of Electrical & Electronic Engineering II	90
ET1011	Introduction to Engineering I	60
ET1012	Introduction to Engineering II	45
LC8001	General Education 1	30
LC8002	General Education 2	30
LC0354	Communicating for Personal and Team Effectiveness	30
MS4120	Basic Mathematics	60
MS4121	Engineering Mathematics I	60

FULL-TIME	SECOND YEAR	HOURS
ET0053	Circuit Theory & Analysis	75
ET1010	Microcontroller Applications	90
LC0356	Communicating for Project Effectiveness (Report)	30
LC0357	Communicating for Professional Effectiveness	30
LC8003	Social Innovation Project	30
LC8004	General Education 3	30
MS4205	Engineering Mathematics II (A)	60
MS4206	Engineering Mathematics II (B)	60
	Year 2 Option 1 Module 1	75
	Year 2 Option 1 Module 2	75
	Year 2 Option 2 Module 1	75
	Year 2 Option 2 Module 2	75

YEAR 2 OPTIONS (CHOOSE ANY 2)		HOURS
Aerospace Engineering Option		
ET0423	Aircraft Electrical Fundamentals	75
ET0429	Aircraft Servomechanisms & Electronics	75
Biomedical Engineering Option		
ET0607	Anatomy & Physiology	75
ET0608	Biomedical Instrumentation Design & Applications	75
Electrical Engineering Option		
ET0050	Electrical Installation Design	75
ET0917	PLC Applications	90
Electronic Engineering Option		
ET0087	Analog Communication Systems	75
ET0513	Data Communication Systems	75

FULL-TIME	THIRD YEAR	HOURS
IC4001	Internship Programme	22 weeks
OR		
IA4001	Internship Programme	12 weeks
ET102Y/Z	Final Year Project	150
Year 3 Double Specialisation Track		
	Module 1	75
	Module 2	75
	Module 3	75
	Module 4	60
	Module 5	60

YEAR 3 DOUBLE-SPECIALISATION TRACKS (CHOOSE ANY 1)		HOURS

Choose any one of the following double-specialisation tracks provided the prerequisites are met. For example, to choose any of the engineering tracks, students must have done modules from the same engineering option in their second year. There are no prerequisites for Microelectronics + Nanoelectronics and Microelectronics + Robotics & Control tracks.

Aerospace + Communication		
ET0425	Aircraft Instrument Systems	60
ET0426	Aircraft Communication & Navigation Systems	75
ET0428	Aircraft Electrical Systems	75
ET0097	Digital Communications	60
ET0130	Networks & Protocols	75
Biomedical + Robotics & Control		
ET0610	Biomedical Equipment & Practices	60
ET0612	Medical Informatics & Telemedicine	60
ET0614	Medical Imaging & Image Processing	75
ET0048	Systems & Control	75
ET0927	Robotics Technology	75
Computer + Communication		
ET0104	Embedded Computer Systems	60
ET0525	Mobile Applications Development	75
ET0721	Client-Server Applications Development	75
ET0097	Digital Communications	60
ET0130	Networks & Protocols	75
Microelectronics + Nanoelectronics		
ET0099	IC Testing	60
ET0100	Quality & Reliability	60
ET0101	IC Design	75
ET0102	Wafer Fabrication	75
ET0909	MEMS & Microsystems	75
Microelectronics + Robotics & Control		
ET0099	IC Testing	60
ET0100	Quality & Reliability	60
ET0102	Wafer Fabrication	75
ET0048	Systems & Control	75
ET0927	Robotics Technology	75
Power + Control		
ET0064	Power Electronics & Drives	60
ET0919	Power Transmission & Distribution	75
ET0920	Power System Analysis	75
ET0048	Systems & Control	75
ET0049	Sensors & Instrumentation	75
Rapid Transit Technology + Communication		
ET0049	Sensors & Instrumentation	75
ET0924	Rapid Transit System	75
ET0925	Rapid Transit Signalling System	60
ET0097	Digital Communications	60
ET0130	Networks & Protocols	75

Diploma in

Energy Systems AND Management

(DESM)

The Diploma in Energy Systems and Management (DESM) course aims for students to become competent technologists to meet the strong manpower needs in a wide range of energy industries.

The course equips students with solid technical knowledge and good practical skills in three distinct areas, namely power engineering, clean energy, and energy efficiency and management. The students will:

- Develop knowledge and skills in energy conversion systems, energy delivering systems, and energy storage technologies,
- Gain expertise in clean energy including solar and wind,
- Establish ability to identify, measure and control key factors for improving energy efficiency and conserving energy,
- Apply advanced Smart Grid technology for integration of different energy systems, intelligent control of energy system operation, deployment of clean energy and management of consumers' energy use.

The course provides a flexible and ability-driven curriculum with the means to prepare students for their future career and further study. Students will undergo more practice-oriented and hands-on training which involves either a semester-long multi-disciplinary project or a semester-long industrial internship or R&D project in their final year.

For details on entry requirements, please refer to the Admissions section of this prospectus.

INTERNSHIPS

Most DESM students will go for a 22-week enhanced internship in Year 3. The internship exposes the students to invaluable authentic industrial learning experiences and provide students a good opportunity to pick up technical knowledge and skills not taught in the classrooms. The students will also learn how to work together with industry personnel, professionals and acquire communication skills essential in a working environment.

ENGINEERING ACADEMY PROGRAMME

Outstanding DESM students are eligible for the Engineering Academy Programme, in which the students will go through an alternative curriculum designed to develop students to be engineers with creative confidence, comfortable with uncertainty, a growth mind-set and are self-driven learners.

ADVANCED MODULES

Students will be given the option of doing up to four advanced modules during their three-year course. These modules are designed to add greater depth of knowledge in key areas that will be useful for students who seek to go on to university studies. The advanced modules offered are:

- Advanced Mathematics I
- Advanced Mathematics II
- Advanced Mathematics III
- Further Mathematics
- Physics

ASSESSMENT

Assessment during each year of the diploma course will be by means of in-course assessments, practical tests, projects and semestral examinations.

CAREER PROSPECTS

Graduates from this course can seek employment opportunities in governmental energy and environmental sectors, power utilities, private energy, electric car, solar system, wind energy, equipment supply companies, small clean energy businesses, along with clean energy R&D centres and international agencies assisting developing countries around the world.

With the energy market experiencing robust global growth due to rising energy demand, volatile oil prices, climate change concerns and technological advances, prospects for graduates from this course are abundant in electric power, energy efficiency and management, as well as clean energy industries. In the next ten years, Singapore's energy industries will need to recruit many technical professionals to keep the country economically competitive.

PROFESSIONAL RECOGNITION

DESM graduates with two years of working experience in the electrical power industries are eligible to apply for the Electrical Technician Licence (LEW) issued by the Energy Market Authority (EMA).

FURTHER STUDIES

Graduates of this diploma course will be able to pursue a degree in energy systems, clean/renewable energy, electrical, electronics and computer engineering at local or overseas universities. The course is accredited by local universities (NUS, NTU, SUTD, SIT and UniSIM) and prestigious foreign universities in the UK, US and Australia.

SCHOLARSHIPS

Students with good academic performance can apply for the EMA-industry, A*STAR, SPRING Singapore, HDB, BCA-industry and NEA scholarships.

COURSE MODULES

FULL-TIME	FIRST YEAR	HOURS
ET0083	Structured Programming	60
ET0085	Computer Aided Design & Drafting (CADD)	30
ET0730	Network Fundamentals	30
ET1003	Digital Electronics I	60
ET1004	Digital Electronics II	60
ET1005	Principles of Electrical & Electronic Engineering I	60
ET1006	Principles of Electrical & Electronic Engineering II	90
ET1011	Introduction to Engineering I	60
ET1012	Introduction to Engineering II	45
LC0354	Communicating for Personal and Team Effectiveness	30
LC8001	General Education 1	30
LC8002	General Education 2	30
MS4120	Basic Mathematics	60
MS4121	Engineering Mathematics I	60

FULL-TIME	SECOND YEAR	HOURS
ET0050	Electrical Installation Design	75
ET0053	Circuit Theory & Analysis	75
ET1010	Microcontroller Applications	90
ET1115	Energy Management & Auditing	60
ET1117	Solar Photovoltiac System Design	75
ME0401	Thermofluids I	60
ME0502	Wind Energy Systems	45
LC0356	Communicating for Project Effectiveness (Report)	30
LC0357	Communicating for Professional Effectiveness	30
LC8003	Social Innovation Project	30
LC8004	General Education 3	30
MS4205	Engineering Mathematics II (A)	60
MS4206	Engineering Mathematics II (B)	60

FULL-TIME	THIRD YEAR	HOURS
ET0064	Power Electronics and Drives	60
ET0919	Power Transmission & Distribution	75
ET0920	Power System Analysis	75
ET1114	Smart Grid & Energy Storage	60
ET1116	Integrated Building Energy Management System	60
IC4001	Internship Programme	22 weeks
OR		
IA4001	Internship Programme	12 weeks
ME0405	Refrigeration & Air-Conditioning	60

Diploma in

Engineering WITH Business

(DEB)

(Jointly offered by School of Electrical & Electronic Engineering,
School of Mechanical & Aeronautical Engineering and SP Business School)

The Diploma in Engineering with Business (DEB) is an innovative multi-disciplinary course that provides students with cross-training in both engineering and business. The course leverages on the experience and expertise of three schools, namely, School of Electrical & Electronic Engineering, School of Mechanical & Aeronautical Engineering and SP Business School, to provide students with an exciting range of learning opportunities.

This diploma is specially designed for students who have a keen interest in mathematics, science and technology, but who may not wish to pursue a pure engineering course, thus offering greater choices and flexibility in their learning journey.

The course aims to:

- Provide students with fundamental engineering knowledge and understanding of technologies.
- Provide students with the knowledge and skills in interpreting technical drawings and understanding product-design issues and considerations.
- Provide students with fundamental business skills and the knowledge to link engineering with business.
- Equip students with life skills such as analytical skills, problem solving skills, communication skills and creative and critical thinking skills.
- Prepare students for lifelong learning by emphasising independent learning, teamwork, and character development.

To achieve the above aims, students will be given broad exposure in both engineering development and business practices through a variety of teaching and learning approaches, with one third of the time spent on learning and applying business concepts to engineering products and businesses. Engineering knowledge and business skills will be integrated over three project modules. In Year 3, students will be given the choice to select any two modules from a list of elective modules.

INTERNSHIPS

In the final year of study, all students will participate in a 22-week enhanced internship. Students will gain real-world work experience either locally or overseas as an intern at organisations or at our Technology Innovation Centres. The internship programme will expose students to invaluable authentic industrial learning experience in the engineering and business services sector.

ENGINEERING ACADEMY PROGRAMME

Outstanding DEB students are eligible for the Engineering Academy Programme in Year 2. Under this programme, students will go through an alternative curriculum designed to develop them to be engineers with creative confidence, comfortable with uncertainty, a growth mindset and self-driven learners.

ADVANCED MODULES

Students will be given the option of doing up to four advanced modules during their three-year course. These modules are designed to add greater depth of knowledge in key areas that will be useful for students who seek to go on to university studies. The advanced modules offered are:

- Advanced Mathematics I
- Advanced Mathematics II
- Advanced Mathematics III
- Further Mathematics
- Physics

ASSESSMENT

Assessment during each year of study will be by means of in-course assessments, practical tests and semester examinations.

SCHOLARSHIPS

Ample prestigious scholarships from SP are available for application by outstanding DEB students.

CAREER PROSPECTS

Graduates of this diploma will be versatile and be able to pursue rewarding careers in both engineering and business organisations. Given the cross-disciplinary training and with adequate working experience, graduates can aspire to become entrepreneurs.

FURTHER STUDIES

Graduates of this course have the flexibility to further their studies in business, various engineering (with business minor) or similar inter-disciplinary programmes in both local and overseas universities. Graduates with good results will be eligible for admission to the second year of the Electrical & Electronic Engineering (with business minor) course at the Nanyang Technological University (NTU) or gain about one years' worth of exemptions at the National University of Singapore (NUS). Graduates of this course have also been admitted to the Singapore University of Technology and Design (SUTD), Singapore Management University (SMU), Singapore Institute of Technology (SIT), University College London and University of Melbourne.

COURSE MODULES

FULL-TIME	FIRST YEAR	HOURS
BA0217	Fundamentals of Economics	60
BA0312	Principles of Marketing	60
ET0083	Structured Programming	60
ET0085	Computer Aided Design & Drafting (CADD)	30
ET1003	Digital Electronics I	60
ET1005	Principles of Electrical & Electronic Engineering I	60
ET1215	Engineering Design & Business Project I	60
ET1407	Introduction to Engineering	90
LC8001	General Education 1	30
LC8002	General Education 2	30
ME0101	Mechanics I	60
ME0401	Thermofluids I	60
MS4120	Basic Mathematics	60
MS4121	Engineering Mathematics I	60

FULL-TIME	SECOND YEAR	HOURS
BA0232	Business Planning for New Ventures	45
BA0313	Essentials of Financial Management	60
BA0314	Marketing Intelligence	60
BA9024	Professional Selling	30
ET0529	Mobile Applications Development	60
ET1006	Principles of Electrical & Electronic Engineering II	90
ET1216	Engineering Design & Business Project II	90
ET1217	Engineering Projects for Entrepreneurs	75
LC0355	Communicating for Project Effectiveness (Proposal)	30
LC8003	Social Innovation Project	30
LC8004	General Education 3	30
ME0104	Mechanical Engineering Systems	60
MS4205	Engineering Mathematics II (A)	60
MS4206	EngineerIng Mathematics II (B)	60

FULL-TIME	THIRD YEAR	HOURS
BA0354	Entrepreneurship & Small Business	60
ET0053	Circuit Theory & Analysis	75
IC4001	Internship Programme	968
LC0357	Communicating for Professional Effectiveness	30
ME2801	Industrial Engineering	60
Two modules comprising 1 Engineering and 1 Business Module		
BA2203	Principles of New Media Marketing	60
BA2213	Investment Analysis	60
ET1115	Energy Management & Auditing	60
ET1205	Wireless Technology Applications	60
ME0205	Product Design & Realisation	60
ME2602	Instrumentation & Control	60

Diploma in

Engineering Systems

(DES)

(Jointly offered by School of Electrical & Electronic Engineering and School of Mechanical & Aeronautical Engineering)

The Diploma in Engineering Systems (DES) is a multi-disciplinary engineering diploma course that is focused on educating students in an interdisciplinary and applied approach. This course will prepare and train you to be an innovator who can take on real-world engineering challenges in the new millennium. In line with Singapore's Smart Nation vision, join us in tackling tomorrow's big challenges today!

The course aims to develop students in:

Technical and system level knowledge and skills in Smart Systems and Urban Transportation Systems as part of Engineering Systems, personal values, professional ethics and skills for life-long learning to cope with rapid advances in engineering systems, and the ability to work in teams and to communicate effectively with all levels of personnel they work with.

The three-year integrated engineering systems curriculum will be staged as foundation year (Year 1), connection year (Year 2) and specialisation year (Year 3) to prepare students for future challenges.

In Year 1, students will explore the fundamentals of engineering with the required modules in Mechanical, Electrical, Electronics and Computer engineering, together with project modules.

In Year 2, while learning engineering at sub-system level, students will be exposed to systems thinking so as to understand how different engineering sub-systems connect with each other and how these systems are impacted by the social and economic considerations.

In Year 3, the course will offer two options which will allow students to apply knowledge and skills acquired during the first two years to real world engineering systems used for smart systems and urban transport.

The specialisation options are:

a) Smart Systems, and
b) Urban Transportation Systems.

ENHANCED INTERNSHIP PROGRAMME

The final-year enhanced internship programme will be based on industry and/or research collaborations to expose students to the practices of the engineering profession and develop their skills. Students will work on their projects during the final semester of the course and will be assessed based on the knowledge and skills they apply in the design and development of new systems, or processes. These projects will be part of their enhanced internships in local or overseas companies or research institutions lasting for one full semester.

ENGINEERING ACADEMY PROGRAMME

Outstanding DES students are eligible for the Engineering Academy Programme, in which the students will go through an alternative curriculum designed to develop students to be engineers with creative confidence, comfortable with uncertainty, a growth mind-set and are self-driven learners.

ADVANCED MODULES

Students will be given the option of taking up to four advanced modules during their three-year course. These modules are designed to add greater depth of knowledge in key areas that will be useful for students who seek to pursue their university studies. The advanced modules offered are:

- Advanced Mathematics I
- Advanced Mathematics II
- Advanced Mathematics III
- Further Mathematics
- Physics

ASSESSMENT

Assessment during each year of study will be by means of in-course assessments, practical tests and semestral examinations.

SCHOLARSHIPS AND BOOK PRIZES

Ample prestigious scholarships are available for application by DES students.

FURTHER STUDIES

Graduates of this course have also been admitted to the local universities such as NUS. NTU, SUTD and SIT. They have the flexibility to further their studies in undergraduate courses leading to degrees in the specialised field of engineering systems.

CAREER PROSPECTS

Graduates of this diploma will be able to pursue rewarding careers from multinational companies, small-medium enterprises to start-ups involved in the creation of a Smart Nation and building complex transportation system. Both areas has ever increasing demand for skilled people.

COURSE MODULES

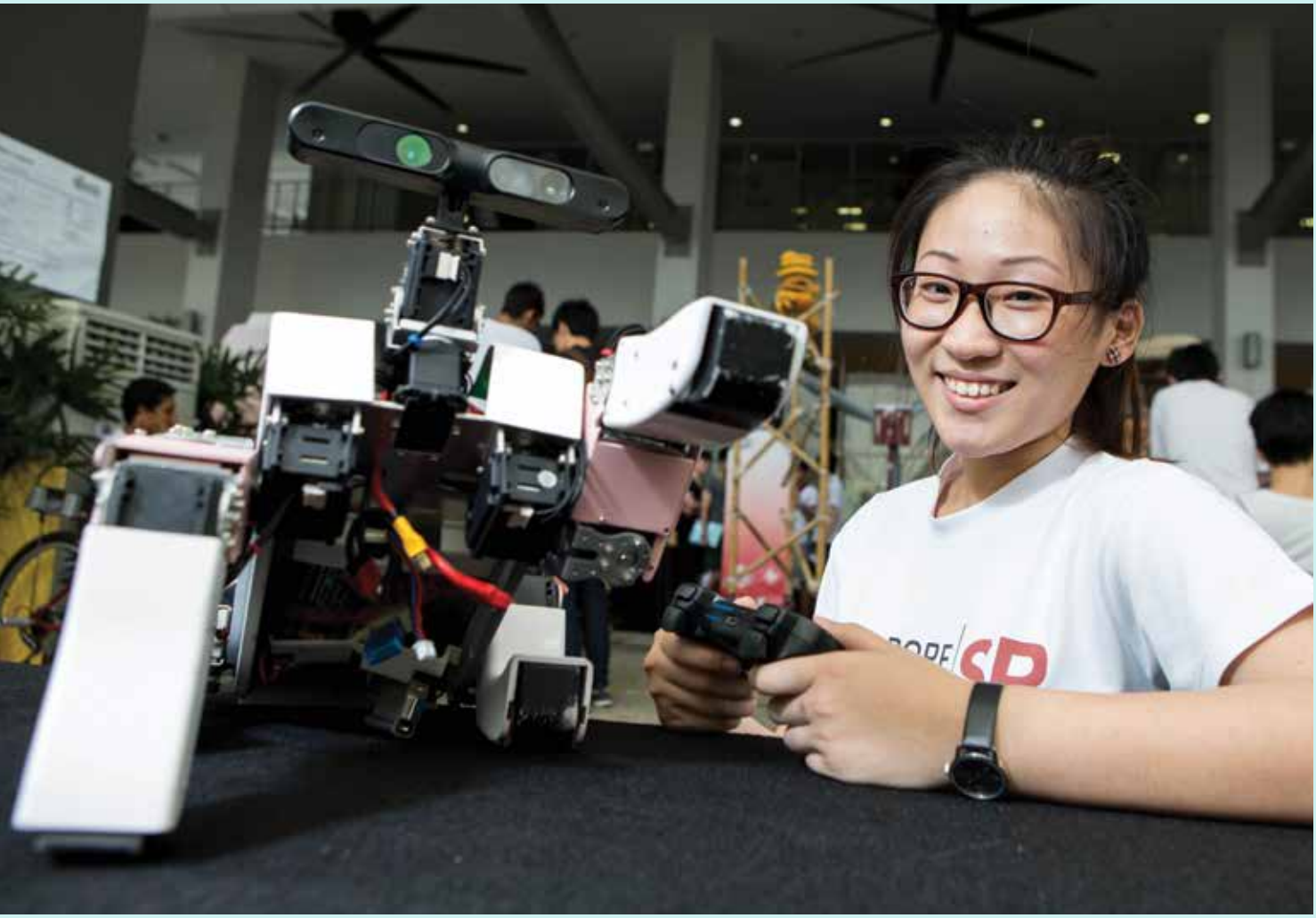
FULL-TIME	FIRST YEAR	HOURS
ET0083	Structured Programming	60
ET1003	Digital Electronics I	60
ET1005	Principles of Electrical & Electronic Engineering I	60
ET1006	Principles of Electrical & Electronic Engineering II	90
ET1011	Introduction to Engineering I	60
LC0354	Communicating for Personal and Team Effectiveness	30
ME0201	Computer Aided Drafting	60
ME0202	Engineering Design & Prototyping	60
MS4120	Basic Mathematics	60
MS4121	Engineering Mathematics I	60
LC8001	General Education 1	30
LC8002	General Education 2	30
ME0101	Mechanics I	60
ME0401	Thermofluids I	60

FULL-TIME	SECOND YEAR	HOURS
ET0087	Analogue Communication Systems	75
ET0053	Circuit Theory & Analysis	75
ME0203	Engineering Innovation Studio	90
ME0301	Engineering Materials I	60
MS4205	Engineering Mathematics II (A)	60
MS4206	Engineering Mathematics II (B)	60
ET1400	Engineering System Design	90
LC8004	General Education 3	30
ME0102	Mechanics II	60
ET0049	Sensors & Instrumentation	75
LC8003	Social Innovation Project	30
ME0402	Thermofluids II	60

FULL-TIME	THIRD YEAR	HOURS
Smart Systems Option		
ET0130	Networks and Protocols	75
ET0525	Mobile Applications Development	75
ET1205	Wireless Technology Applications	60
ET1408	Smart City Systems Design	60
ET1409	Data Analytics	60
ET1410	Project Management	60
Urban Transportation Systems Option		
ET1403	Electrical Control System	60
ET1404	Electrical Power System	60
ME0403	In-Vehicle Systems	75
MA8005	Transportation Management	60
ME0204	Urban Transportation Design	60
ME0103	Mechanics of Machine Elements & Dynamics	60
Internship		
IC4001	Internship	

Common Engineering Programme

(CEP)



The Common Engineering Programme (DCEP) is jointly offered by the School of Mechanical & Aeronautical Engineering and School of Electrical & Electronic Engineering.

The DCEP is specially designed for students who are keen in engineering but do not know which discipline to major in. It comprises a common first semester where students take a basket of modules to help them discover their salient interests and strengths.

COURSE MODULES

FULL-TIME	FIRST YEAR	HOURS
First Semester (Common)		
ET1003	Digital Electronics I	60
ET1005	Principles of Electrical & Electronics Engineering I	60
ET1011	Introduction to Engineering I	60
LC8001	General Education 1	30
ME1101	Mechanics I	60
ME1201	Computer-Aided Drafting	60
MS6140	Basic Mathematics	60
Second Semester (select one option to specialise) (DARE, DBEN, DME & DMRO option)		
LC0354	Communicating for Personal and Team Effectiveness	30
LC8002	General Education 2	30
ME1021	Introduction to Engineering	90
ME1301	Engineering Materials I	60
ME1401	Thermofluids I	60
MS6161	Engineering Mathematics I	60
MS6508	Computer Programming	60
(DASE, DCPE, DEEE, DES & DESM option)		
ET0083	Structured Programming	60
ET1004	Digital Electronics II [1]	60
ET1006	Principles of Electrical & Electronics Engineering II	90
ET1012	Introduction to Engineering II [2]	45
LC0354	Communicating for Personal and Team Effectiveness	30
LC8002	General Education 2	30
MS4121	Engineering Mathematics I	60

[1] DES students will be taking Thermofluid I
[2] DES students will be taking Engineering Design and Prototyping

At the end of the first semester, students will apply for one of nine courses to specialise in.

From the School of Mechanical & Aeronautical Engineering

- Diploma in Aeronautical Engineering (DARE)
- Diploma in Bioengineering (DBEN)
- Diploma in Mechanical Engineering (DME)
- Diploma in Mechatronics & Robotics (DMRO)

From the School of Electrical & Electronic Engineering

- Diploma in Aerospace Electronics (DASE)
- Diploma in Energy Systems & Management (DESM)
- Diploma in Computer Engineering (DCPE)
- Diploma in Electrical & Electronic Engineering (DEEE)
- Diploma in Engineering Systems (DES)

ADVANCED DIPLOMA IN BUILDING AUTOMATION AND SERVICES (PART-TIME)

For more information on Part-Time Diploma Courses, you may refer to **www.pace.sp.edu.sg**

ADVANCED DIPLOMA IN POWER ENGINEERING – EARN AND LEARN PROGRAMME (PART-TIME)

For more information on Part-Time Diploma Courses, you may refer to **www.pace.sp.edu.sg**

DIPLOMA IN ENGINEERING (ELECTRICAL-RAPID TRANSIT TECHNOLOGY) - EARN AND LEARN PROGRAMME (PART-TIME)

For more information on Part-Time Diploma Courses, you may refer to **www.pace.sp.edu.sg**

ADVANCED DIPLOMA IN POWER SYSTEMS ENGINEERING (PART-TIME)

For more information on Part-Time Diploma Courses, you may refer to **www.pace.sp.edu.sg**

ADVANCED DIPLOMA IN PROCESS CONTROL AND INSTRUMENTATION (PART-TIME)

For more information on Part-Time Diploma Courses, you may refer to **www.pace.sp.edu.sg**

DIPLOMA IN ENGINEERING (RAPID TRANSIT TECHNOLOGY) (PART-TIME)

For more information on Part-Time Diploma Courses, you may refer to **www.pace.sp.edu.sg**

DIPLOMA IN ENGINEERING (CONTROL & AUTOMATION) (PART-TIME)

For more information on Part-Time Diploma Courses, you may refer to **www.pace.sp.edu.sg**

DIPLOMA IN ENGINEERING (POWER ENGINEERING) (PART-TIME)

For more information on Part-Time Diploma Courses, you may refer to **www.pace.sp.edu.sg**

SPECIALIST DIPLOMA IN BIOMEDICAL ENGINEERING (PART-TIME)

For more information on Part-Time Diploma Courses, you may refer to **www.pace.sp.edu.sg**

SPECIALIST DIPLOMA IN DIGITAL TECHNOLOGIES FOR A SMART CITY (PART-TIME)

For more information on Part-Time Diploma Courses, you may refer to **www.pace.sp.edu.sg**

SPECIALIST DIPLOMA IN ENERGY EFFICIENCY & MANAGEMENT (PART-TIME)

For more information on Part-Time Diploma Courses, you may refer to **www.pace.sp.edu.sg**

SPECIALIST DIPLOMA IN NETWORK SECURITY (PART-TIME)

For more information on Part-Time Diploma Courses, you may refer to **www.pace.sp.edu.sg**

DIPLOMA (CONVERSION) IN COMPUTER NETWORKING (PART-TIME)

For more information on Part-Time Diploma Courses, you may refer to **www.pace.sp.edu.sg**

TECHNOLOGY CENTRES

CENTRE FOR AEROSPACE ELECTRONICS

The centre promotes a wide spectrum of aerospace projects undertaken by students and staff. Ongoing projects include Autonomous and Competition UAVs, Mini Aerial Devices, Flight Trainer Prototypes as well as other industry projects. Facilities available to our students include a UAV research lab, teaching labs and a Final Year Project room. The centre works closely with industry partners to develop solutions for industry applications. This allows students to be involved and work on industry-related projects.

CENTRE FOR AUTOMATION, ROBOTICS & CONTROL

The centre aims to develop automation and robotics solutions to meet the needs of Singapore's infrastructure inspection, logistics, healthcare, transport, and edutainment industries and offer our students an industry-relevant education with a global orientation. The centre is equipped with a wide range of Fieldbus equipment installed onto Foundation Fieldbus, Profibus and ASI model plants. In this centre, students learn through hands-on experiments the design of various control algorithms and man-machine interface. Our students participate in local and international competitions, winning numerous awards over the years.

CENTRE FOR ENERGY SYSTEMS

The centre, established in 1994, aspires to be a Centre of Excellence in learning and development of latest technologies in renewable energy, energy efficiency, electrical power systems and green transportation. The centre is equipped with solar and wind power stations and modern smart power networks (microgrids and smart grid) to provide students with a platform on which they can learn and build up capabilities and skills in the design, operation and maintenance of various energy systems through hands-on exercises or final year projects.

CENTRE FOR DIGITAL SIGNAL PROCESSING & BIOMEDICAL APPLICATIONS

The centre aims to provide a suitable environment and infrastructure for staff and students to be involved in applied research and development work in the area of digital signal processing and biomedical applications. These include the areas of:

- Image and video analysis and processing
- Speech and audio signal processing
- Biomedical signal and image processing
- Medical devices and instrumentation

The centre specialises in digital signal processing and its applications in various areas such as video surveillance, traffic monitoring, biometric recognition, health monitoring and medical imaging. It also specialises in the development of medical devices for the assessment of patients and for improving the quality of life of patients and elderly. The centre conducts research and development projects, provides consultancy services and training in digital signal processing and its applications.

CENTRE FOR IC DESIGN & NANOFABRICATION

The centre provides the facilities to support all activities related to IC Design, IC testing, Wafer Fabrication, Micro Electro-Mechanical Systems (MEMS), Nanofabrication and PV Cell. It is equipped with wafer fabrication, MEMS processing and integrated circuit CAD tools for both front-end and back-end flow of IC design process. It comprises a 450-square metre cleanroom of class 100 and class 1000 that houses processing tools such as PECVD, Diffusion/oxidation furnace, ICP, RIE, Sputtering systems, SEM and many more. It provides resources for staff and students to conduct applied R&D work in IC Design, Wafer Fabrication, MEMS, Flexible Electronics and PV cell. It also caters to students for their laboratory sessions in the following modules: IC Design, Wafer Fabrication, Microdevices and Materials, NEMS and Nanodevices, MEMS and Microsystems, PV Manufacturing Process and IC Testing.

CENTRE FOR COMPUTER SYSTEMS & INFOCOMM

The Centre for Computer Systems & Infocomm Technology is a project development centre with technical supports from pools of academic staff who are actively involved in Computer Systems and Infocomm Technology projects. The centre comprises of four main areas of technology:

- **Cloud Computing**
  The group specialises in Data Centre and Network Management, Virtualisation and Cloud Computing technologies.

- **Embedded Systems Applications**
  This group focuses in microcontroller and embedded systems design and applying these technologies to solve real world problems.

- **Mobile Phone and Multimedia Applications**
  The group focuses on development applications on Mobile Devices (iOS and Android platforms) and server service using open source platforms.

- **Smart Devices and Wireless Applications**
  The group focuses on hardware and firmware design of smart connected devices and wireless modules, connecting them to backend services and cloud resources through standards-based protocols.

Backed by the robust experience of the centre's members, the centre has been providing technical consultation, training, seminars and project collaboration to the local government, educational institutions, businesses and industry.

YOUNG ENGINEERS CLUB (YEC)

Set up for the purpose of conducting enrichment programmes and other activities for budding talent under the Young Engineers Club. It serves as a platform where secondary school students can exercise their creativity and ingenuity to create engineering models and projects. In this lab, resources for learning of basic engineering in a fun and interesting manner are mounted for instructional and experimental purposes.

LEARNING LABORATORIES

AIRCRAFT ELECTRICAL SYSTEMS & SERVO MECHANISMS AND ELECTRONICS

This laboratory houses professional Electrical Systems training equipment for students to acquire deep skills through experiential learning. The Aircraft Electrical Systems Trainer, Aircraft Fire Detection & Protection Systems Trainer, Aircraft Ice & Rain Protection Systems Trainer as well as the Boeing 747 Electrical Systems Training Panel in this laboratory provide students a practical platform to learn and develop a solid foundation in the network of components that generate, transmit, distribute, utilize and store electrical energy in an aircraft which is essentially the aircraft electrical system.

This laboratory is also equipped with Servomechanisms and Electronic Systems, with various electronic circuit boards for students to perform experiments to understand the characteristics of signal processing devices such as integrators, differentiators, modulators and demodulators as well as the working principles of various control systems and semiconductor devices.

AIRCRAFT ELECTRICAL FUNDAMENTALS

This laboratory is equipped with the Lab Volt Training system to allow students to learn and verify basic electrical fundamentals. The training system allows students to build both DC and AC (single-phase and three-phase) circuits. There are also a variety of modules such as motor and generator that allows the students to learn the fundamental operations of these components. With a strong foundation on the electrical fundamentals, the students will be able to better understand the aircraft electrical systems.

FLIGHT SIMULATOR AND MAINTENANCE TRAINER

This laboratory houses the Airbus A320 Flight Simulator and Maintenance Trainer. Students are able to gain an integrated and real-time understand of the operations and functions of the aircraft electronic systems through the Airbus A320 Flight Simulation. As a maintenance trainer, aircraft system faults can be simulated and reported. Such knowledge is important and necessary for the maintenance engineers to understand faults reported by pilots before carrying out troubleshooting work.

AIRCRAFT SYSTEMS AND MAINTENANCE (ELECTRICAL)

This laboratory provides equipment and tools that are used to train students on the skills for maintaining and repairing aircraft wiring assembly and connections. Students will be able to learn and practise their skills in crimping, wire locking, insertion and extraction of connector pins. The materials, tools and equipment used are in accordance with the standards used in the aerospace industry. The students will also learn how to use aircraft electrical measuring instruments to perform electrical tests to check on wire continuity and insulation.

AIRCRAFT INSTRUMENT SYSTEMS

This laboratory is equipped with various aircraft systems such as pilot-static systems, gyroscopic systems, compass systems, air-data systems and electronic display systems. Students will learn the terminologies, basic concepts as well as the working principles of these systems and also the operation of the ARINC digital data bus in aircraft systems.

AIRCRAFT COMMUNICATION AND NAVIGATION SYSTEMS

This laboratory is used to support third-year DASE Aircraft Radio & Navigation modules. It is equipped with specialised Avionic System Trainers using authentic aircraft components, which together with simulation software implementation is able to enhance student's learning experience. In addition, there is a flight simulator which students can use to plan their flight paths, and utilise the communication and navigation systems to fly their aircraft according to their planned flight paths.

AIRCRAFT AUTOMATIC FLIGHT AND ELECTRONICS SYSTEMS

This laboratory is used to support the practical lessons of Aircraft Automatic Flight and Electronic Systems. It is equipped with authentic Aircraft Systems for students to operate and conduct experiments to enhance their understanding of aircraft systems. These authentic Aircraft Systems include Autopilot System, Cabin Pressurisation System, Fuel quantity measurement system, Fuel flow system and Temperature System.

ANALOG COMMUNICATION SYSTEMS

Students learn to use equipment such as spectrum analysers, oscilloscopes and electronic counters to verify the theory of signal representations in time and frequency domains, measure the frequency response of filters and investigate the principles of AM, FM, ASK and FSK. They learn how to simulate an AM circuit using simulation software. They also learn about the effects of noise, interference, electromagnetism and electromagnetic induction, speech and frequency response of the ear. They will participate in exercises that integrate theories with practical experience to enhance their critical and creative thinking skills.

ANALOG SYSTEMS

Students investigate the characteristics of bipolar junction transistors and operational amplifiers. Students also perform work on the applications of these devices in various electronic circuits such as small signal transistor amplifiers and power amplifiers.

BIOMEDICAL ELECTRONICS

Equipped with computers and general laboratory equipment such as oscilloscopes, function generators, power supplies and trainer kits, as well as medical instruments such as oximeter, blood pressure apparatus, spirometer, blood gas analysers and medical transducers and amplifiers. This laboratory also houses physiological models, anatomical charts, complete Biopac instrumentation system, and Biobench software and hardware. Students will conduct experiments related to physiology, instrumentation and biomedical electronics.

BIOMEDICAL ENGINEERING

This lab is used by students to learn circuit design and biomedical electronic system. It is equipped with basic and specialised tools to train students for hands-on practice for biomedical circuit design. Students will learn how to use tools commonly used in the biomedical industry, and the safety issues involved.

BIOMEDICAL SIGNAL & IMAGING PROCESSING

This lab provides Year 3 students with an experience in biomedical signal, image processing, biomedical equipments and engineering practices. It is equipped with biomedical signal acquisition systems including ECG, EEG, EMG and imaging devices such as ultrasound machine, slip lamp and x-ray modules to train students on how to capture biomedical signals and images. With the aid of computers, students will perform experiments in signal analysis and 2D/3D image processing. In addition, the lab is also equipped with biomedical equipment, such as microscopes, ventilators and testers, ECG machines, defibrillators, ventilators and electrical infusion pumps. Students will learn the principles of operating the medical equipments and monitoring them over the network.

BROADBAND COMMUNICATION

This lab provides Year 2 and Year 3 students with practical experience in the configuration, troubleshooting, and maintenance of computer and broadband networks. Students will be able to work on networking devices like Cisco routers, Ethernet switches, GPON systems, ATM switches, DSLAM, and media gateway.

BUILDING AUTOMATION SYSTEMS

Equipped with direct DDC controller, simulator boards, building automation networks and quipped for experiments on building automation systems, energy conservation systems as well as central air-conditioning systems.

CIRCUIT THEORY & ANALYSIS

The laboratory is used by students for carrying out experiments to complement the understanding of theories and concepts taught. Experiments on more advanced topics of electrical engineering include three-phase circuits, three-phase power measurements, power factor correction, series and parallel resonance, network analysis and star-delta transformation.

COMPUTER NETWORKING 1

Used by Year 1 students to familiarise themselves with basic networking concepts such as IP addressing, file and printer sharing and network devices such as switches and routers. Besides peer-to-peer networking, they learn client-server environment with web, FTP and DNS services. Packet filtering as a form of network security and disaster prevention measures are also covered in the lab exercises. The laboratory is also designed to provide students with the necessary exposure to transferring multimedia information across networks.

COMPUTER NETWORKING 2

Used by Year 2 students, it houses Cisco routers and switches set up as a 5-router/ 2-switch configuration. Each group of students undertakes to set up routing and switching strategies on the equipment, emulating the transfer of information over a small network or across networks spanning several offices. Students also develop routing strategies to block or allow access to information.

COMPUTER NETWORKING 3

The lab is used by Year 1 students to gain hands-on experience on different services available on a network. They construct their first working LAN from basic equipment, learn to share computer and network services, connect to dial-up and online systems and practise inter-connecting computers using basic network equipment.

COMPUTER NETWORKING 4
Students are introduced to different computer and network configurations here. They learn how to set up network servers and a local area network comprising of routers and switches. The laboratory is also designed to provide students with the necessary exposure to transferring multimedia information across networks.

COMPUTER OPERATIONS 1
Used by Year 1 students, the laboratory supports the teaching of basic workstation operations. Students are exposed to different operating systems, which they will use in their three-year long diploma course. They learn how to install, configure workstation operation systems, and understand the utilities offered by the different operating systems.

COMPUTER OPERATIONS 2
With a one-to-one ratio of workstation and server, each student sets up his/her own computer server and workstation. Students learn how to install and configure their own computer server and understand how to set up the necessary server operations and services for users. In order to check that the services are set up correctly, students then use the attached workstation clients to access and verify the set-ups.

COMPUTER SECURITY
Used by Year 2 and Year 3 students, the laboratory supports the teaching of Network Security and Firewall Technologies. Students have the opportunity to learn to discover the security vulnerabilities in network systems and provide countermeasures to secure the networks.

CLIENT-SERVER SYSTEMS
The lab is equipped with 22 PCs and a server that supports final-year students. Students gain hands-on exercises for Client Server Systems, Object Oriented Design and Programming, Multimedia Development, Database Management Systems and Creating Your Own DVD (General-Elective) modules. Students use Visual Studio.NET, Oracle JDeveloper, MS SQL Server, Macromedia and Adobe software for their lab experiments.

DATA COMMUNICATION SYSTEMS
The lab provides students with the necessary understanding of equipment and techniques used in the implementation of data communication systems. They are also provided with basic knowledge in the field of Computer Networks.

DATA STORAGE TECHNOLOGY
The lab is equipped with dedicated testers which give students practical hands-on experience in performing measurement of different types of Hard Disk Drive and Solid State Drive. The facility also provides students with opportunities to setup various configurations of storage system to study their advantages and disadvantages. Students will carry out measurement of magnetic properties of different materials using in-house testers.

DESIGN & FABRICATION
Used by Year 2 students to learn how to design and fabricate a mechatronic project. Essential skills like printed circuit board layout planning, soldering, circuit assembly and troubleshooting as well as integrating the mechanical and electronic parts are covered in extensive hand-on sessions. In line with the CDIO initiative, teamwork, creative and critical thinking as well as presentation skills are also emphasised in this lab.

DESIGN & INNOVATION
This lab is used to support students in building their CDIO (Conceive-Design-Implement-Operate) Year 2 projects. Students may make use of the lab facilities to carry out hands-on project construction. The project comprises design elements and includes microcontroller, sensors and output devices. Students are required to construct and trouble-shoot the processor board, power supply and other peripheral circuits required by the system and apply the knowledge learnt to programme and interface the microcontroller to external input and output devices.

DIGITAL COMMUNICATION SYSTEMS
Investigation of various digital communication concepts and techniques including signal sampling, pulse code modulation, digital signalling, digital carrier modulation and channel coding are undertaken here.

DIGITAL ELECTRONICS
The laboratories are equipped with Logic Trainers for students to acquire knowledge and skills of fundamental digital electronics through various experiments starting from numbers used in digital electronics, logic gates, combinational logic circuits, arithmetic circuits, flip-flops and progressing to more complex logic functions covering asynchronous counters, shift registers, and MSI devices such as decoders, encoders, multiplexers and de-multiplexers.

DIGITAL SIGNAL PROCESSING
Fundamental concepts and knowledge on laboratory. Structural and interactive learning are emphasised through the use of simulation software packages such as MATLAB and Simulink. As a solid foundation for learning more advanced DSP theories, the students analyse the different conceptual blocks of a simulated DSP system.

ELECTRICAL INSTALLATION
Used by students to perform hands-on experiments in various areas: measurement, testing and troubleshooting of final circuits to mimic domestic electrical installation; industrial wirings using relays, contactors and timers; project-based design on traffic light control and motor sequential circuits; motor starters like direct-online starter, and new technology in electrical installation such as KNX system. Students will also learn the use of various test instruments as part of the hands-on sessions.

ELECTRONICS
The lab is equipped with digital training systems for experimentation on various digital devices like logic gates, flip flops and counters. Students also learn to use power supplies, function generators and oscilloscopes.

ELECTRICAL TECHNOLOGY
The lab is used by Year 1 students for experiments on Electrical Engineering Fundamentals. It is equipped with digital multimeters, micro-ammeters, regulated power supplies, signal generators, oscilloscopes, resistors, decade resistance boxes, bar magnets and coils.

EMBEDDED SYSTEMS
Equipped with personal computers, microcontroller emulation board, board level internet controllers, I/O target boards and network remote control emulation board. Students learn to interface the microcontroller with input/output peripherals and assemble embedded Internet systems.

ENERGY MANAGEMENT & AUDITING
The laboratory is designed to equip participants with the knowledge and skills required to implement Measurement and Verification (M&V) measures in centralised chiller system in accordance to Green Mark standards. Students will be exposed to the key instruments used for the chiller plant M&V, recommended good practices, and fundamentals of heat balance. In order to properly evaluate the efficiency of the centralized chiller system, the students will learn how to accurately measure the variables that determine the system efficiency.

ENGINEERING PROJECTS FOR ENTREPRENEURS

This lab is unique to the Diploma in Engineering with Business course to support the delivery of the modules for better integration of engineering projects and business practices. It provides facilities for students to perform prototyping of engineering designs and business ideas and facilitates interactive and collaborative project activities.

FABLAB@SP

This laboratory provides students with a platform for learning, innovation and invention. It is a place for students to create, learn, play, mentor and to invent. FabLab@SP houses advanced equipment for digital fabrication, such as 3D printers, laser cutters, precision milling machine, CNC router, circuit board milling, an electronics workbench and more, allowing students to make almost anything. It is part of the global fablab community of learners, educators, technologists, makers and innovators, a knowledge sharing network that spans 30 countries and 24 time zones. FabLab@SP is also actively involved in promoting the maker culture in Singapore.

FINAL-YEAR PROJECT

These laboratories provide sophisticated computers needed by full-time final-year students to construct and realise their final year projects. With SPICE connections for Internet access, the place provides a conducive environment for learning, teaching and managing the final-year projects by students and staff.

GREEN MOBILITY

This laboratory comes with facilities to learn the operation and control of DC and AC machines under different load conditions. They can also use the inverter drive systems to control an electric train. The laboratory also houses equipment for learning rapid transit signalling concepts for Rapid Transit Signalling System.

HIGH SPEED INTELLIGENT & FLEXIBLE INSPECTION SYSTEM) (HIFIS)

Part of the Centre for Fieldbus Technology, it houses several models of manufacturing plants that uses PROFIBUS and Foundation Fieldbus Technology. One of which is the High Speed Intelligent and Flexible Inspection System that demonstrates the integration of various devices used in factory automation. It also houses the Industrial Automation Laboratory which supports activities that are related to the process and factory automation industry. It is used for teaching of modules; Intelligent Systems and Systems and Control. Equipment available includes a complete range of PLC with intelligent modules, fault tolerant control system, pneumatic components, sensors and instrumentation. Software and hardware tools for the configuration and analysis of the PROFIBUS and Foundation Fieldbus systems and Matlab for control system designs are available at the facility.

IC DESIGN

This lab is equipped with workstations which run on Linux platform and uses some of the industrial standard EDA tools. With this facility, students are able to have practical hands-on experience in designing a circuit. They will go through a digital IC design flow, which is commonly practised in the industry, in designing a digital circuit. They will learn how to design a circuit up to the layout level, starting from either using Hardware Description Language (HDL) or doing schematic capture of the design.

INTEGRATED CIRCUIT (IC) TESTING

Students will have the opportunity to apply what they have learnt in their lectures to write programmes that run on an automated test system to test various standard TTL digital devices. They will learn to set up the test system to perform DC/AC parametric tests and functional tests on these devices.

INSTRUMENTATION & PHOTONICS

The lab is equipped with various state-of-the-art measurement instruments, transducers, transmitters, industrial PLCs and virtual instrumentation software which give students practical hands-on experience in implementing transmission, measurement and control techniques. Experiments are designed to enable the students to comprehend modern process measurement technology used in industry, sensor applications and the role these techniques play in control and instrumentation. The lab also consists of an elaborate laser-optics arrangement for developing photonics projects. The facility is equipped with systems for fibre optic sensing. Apart from this, there are a number of experiments to expose students to the principle of photonics, different applications of lasers such as interferometry, pressure sensing, proximity sensing and different fibre optic applications.

INTRODUCTION TO ENGINEERING

These laboratories are used by Year 1 students to design, test and build several interesting projects. Through these projects, theory learnt in other Year 1 modules comes alive. Essential skills like circuit simulation, printed circuit board layout planning, soldering, circuit assembly and troubleshooting are also covered in extensive hand-on sessions. As part of CDIO initiative, teamwork, creative and critical thinking along with presentation skills are emphasised in this lab.

LOGIC DESIGN

The lab is installed with 23 sets of PCs running FPGA-advantage software. Students learn how to design logic circuits and implement their designs using programmable logic devices (PLDs).

MEDICAL EQUIPMENT

Supports Year 2 and Year 3 modules in the area of biomedical instrumentation and biomedical signal processing and analysis. It is equipped with hardware like computers, scopemeters, function generators and biomedical instrumentation training kits, and software like LabVIEW and Matlab. Students will learn the principles and design of biomedical instrumentation and perform experiments in biomedical signal analysis.

MICROGRID SYSTEMS

The lab is equipped with micro-grid that integrates solar system, wind system, fuel cell and battery bank through the advanced data acquisition and control system. The students learn the components and structure of a micro-grid. Analysing the on-line data and control programme help students to understand operation and control of a micro-grid in both stand-alone mode and grid-integrated mode.

MICROCONTROLLER APPLICATIONS

The lab provides hardware and software development tools for developing microcontroller-based systems. The hardware consists of microcomputers, microcontroller evaluation module (EVM) boards and I/O boards. The software includes editor, compiler and simulator. Students learn the techniques of writing microcontroller programmes and ways of interfacing microcontroller to external devices or circuits.

MICROPROCESSOR SYSTEMS

It has facilities for embedded systems development based on the PC/104 platform and the C language and the Internet. Thus it is possible to test LCDs, stepper motors, keypads and digital to analog converters in one platform.

NETWORK INFRASTRUCTURE
Designed to emulate a five-storey building in which the point of-presence is transferred to a Main Distribution Facility (MDF) and then to Intermediate Distribution Facilities (IDF) on each floor. Students learn how to design and implement vertical and horizontal cabling strategies using cable, fibre and wireless media. Students will also learn how to implement redundant network strategies and practical LAN implementation and interconnection into WAN.

NETWORK OPERATIONS 1
Used by Year 3 students to learn how to manage and monitor networks with various tools and monitoring services. They learn how to interpret reports and analyse data from network probes. With such data, students will be able to optimise data transfer across networks. The laboratory is equipped with servers, routers and network monitoring equipment.

NETWORK OPERATIONS 2
Students learn how to implement and enforce computer and network security across servers and LANs. As part of the practical training, students will set up physical security and authorization systems, configure network firewalls and firewall appliances. They will also have hands-on experience in configuring and maintaining Cisco PIX Firewalls and Intrusion Detection Systems.

POWER DISTRIBUTION
This lab provides practical training for students to learn up-to-date industrial practices of power distribution systems based on relevant code of practice and procedure adopted in the power industry. The lab is equipped with industrial grade switchgear and distribution transformer, as well as equipment to train students for various power protection techniques.

POWER ELECTRONICS & DRIVES
It is a modern facility to provide update training in power electronics drives and systems. The laboratory is equipped with the state-of-art equipment and instruments necessary to impart practical knowledge on power electronic systems and drives. Students can easily build various power electronics systems and converters on the power electronic trainer using plug-in type passive and active components.

POWER SYSTEM SIMULATOR
The Power System Simulator is a scaled down model of an electrical power system, designed to mimic the real power systems and modern practices. The three main aspects of a power system namely power generation, transmission and distribution are ergonomically integrated to reflect real practice and to provide operational training for students at diploma and undergraduate level, as well as providing a means for operational training for industrial and utilities technical personnel. The hardware system is manually controlled through optimally positioned controls, switches and relays on the panel with remote monitoring and control through a SCADA system.

PRINCIPLES OF ELECTRICAL & ELECTRONIC ENGINEERING
Used by students to acquire practical skills and knowledge in the area of electrical and electronic engineering, which include learning the use of basic test equipment like DC Power Supply, Digital Multimeter, Function Generator and Oscilloscope. The laboratories are also used by the students to verify circuit theorems and principles by conducting experiments.

QUALITY & RELIABILITY
Students are given practical work on SQC and SPC. This is done using software packages that perform the various statistical calculations, plotting of distribution curves and control charts used in quality control. Also included are assignments on TQM, ISO9000, SPC, DOE, COQ and Environmental Stress Testing.

ROBO-GARAGE
This laboratory is used to support the teaching of Robotics related modules and final year projects. The laboratory is designed such that second and third year students are able to integrate various knowledge and skills to undertake robotics and artificial intelligence related projects.

SATELLITE & OPTICAL COMMUNICATION
The lab is used to reinforce students' understanding of optical fibre transmission systems and satellite communication systems. The optical experiments introduce students to the bandwidth and attenuation measurements in optical fibre communication system. Test and measurement techniques used in practical optical fibre system are also covered in these experiments.

PV SYSTEM AND SMART GRID
The Solar Photovoltaic setup helps students understand the characteristics of solar cells/modules, which will enable them to design, test and commission Solar Photovoltaics Systems. The Smart Grid Training System (SGTS) set up in the laboratory provides the students with a practical platform to learn the structure, operation and control of a modern smart power system that is composed of various power generations (conventional and alternative energy), transmission and distribution (T&D), energy storage, intelligent networking systems and advanced automation control. Through experiments, students will gain the knowledge of how to implement the modern technologies to secure stable, reliable and economic operation of an electrical power system.

SYSTEMS & CONTROL
Equipped with a wide range of equipment including various type of model plants control systems and control software. In this laboratory students can model, simulate, analyse and design various control systems as well as study various control techniques through hands-on experiments.

WIRELESS COMMUNICATION
The lab is equipped with sophisticated RF equipment such as spectrum analyser, vector signal analyser, RF Generator, Vector signal generator. These facilities are used for training students in RF measurement, Mobile Communication Systems, Wireless Technology Applications and Wireless Technologies (RFID, Bluetooth, Wi-Fi, WiMAX). The lab also provides hand-on experiments for students to understand wireless technologies and applications using hardware and software such as RFID training kit, ZigBee training kit, WLAN Router and Adaptor.

WIRELESS NETWORKING
The lab is equipped with 24 PCs and various wireless networking devices. Students are able to make use of the PCs to do some network setup and configuration using Linux. The various wireless networking devices (Residential Gateway, Wireless Access Points, Wireless Bridges, and different types of Antennas) provide students a good exposure to acquire hand-on skills to setup and configure these wireless devices through various experiments.

The School of Mechanical & Aeronautical Engineering (MAE) is one of the first engineering schools to offer formal engineering education in Singapore. MAE students are imbued with a healthy curiosity to explore the marvels of engineering through multi-disciplinary projects. They are nurtured to be versatile thinkers eager to improve society with innovative solutions. MAE provides opportunities to work with leading research institutes on social initiatives that benefit the unfortunate and underprivileged.

OUR DIPLOMA COURSES

The School of Mechanical & Aeronautical Engineering offers six three-year full-time diploma courses:

- Aeronautical Engineering#
- Bioengineering#
- Mechanical Engineering#
- Mechatronics and Robotics#
- Engineering with Business (jointly offered with the School of Electrical & Electronic Engineering and SP Business School)
- Engineering Systems# (jointly offered with the School of Electrical & Electronic Engineering)

(#) Students may choose a Common Engineering Programme in the first semester.

NTERNSHIP PROGRAMME

The Internship is mandatory for students of the four diplomas offered solely by MAE. The programme provides authentic and essential out-of-classroom working experience. Students get to interact with and learn from industry experts.

ADVANCED MODULES

These optional modules provide additional knowledge in selected topics. Students may offer up to three modules in Advanced Mathematics modules and one other advanced module (see diploma courses for listing).

ASSESSMENT

Assessment is based on regular course work and written examinations. A minimum standard must be attained for each stage of the course.

SP AERO HUB

Our state-of-the-art AERO Hub houses several operational fixed-wing and rotary-wing aircraft, a full-motion flight simulator completely designed and built by students and staff, and an Unmanned Aerial Vehicle (UAV) Aeronautical Centre for collaborative research and development work with universities and aerospace companies.The AERO Hub will also be extensively used to jointly teach degree courses in Aeronautical Engineering and Aerospace System with the Singapore Institute of Technology (University of Glasgow) and SIM University.

UNIVERSITY EXPERIENCE AT SUTD

Final-year students of all SP engineering diplomas have the opportunity to attend a first year module 'Introduction to Design' at Singapore University of Technology & Design (SUTD). Apart from prioritised admission to SUTD and scholarship, they get to work on projects supervised by professors at the International Design Centre and the Temasek Laboratories.

** All full-time diploma students are required to take two compulsory Education and Career Guidance Modules in SP. Students will take SP101A: Education and Career Guidance 1 – Personal Development (15 hours) in their first year. In their second or third year, students will take SP201A: Education and Career Guidance 2 – Career Development (30 hours).*

** All students are required to take one compulsory Sports for Life (SFL) module for one semester in their first year in SP. In their second and third year, students may sign up for SFL module as an elective.*

Diploma in

Aeronautical Engineering

(DARE)

The Diploma in Aeronautical Engineering (DARE) is the first aero diploma course in Singapore. It was launched in 2002 in response to the demands for qualified aircraft maintenance engineers in the rapidly expanding aerospace maintenance, repair and overhaul (MRO) industry in Singapore and the Asia-Pacific region.

The DARE course provides a solid grounding in mechanical engineering followed by specific aircraft topics.

Students undergo pragmatic hands-on lessons in state-of-the-art facilities that simulate a real work environment. The learning aids include a fighter jet, twin-engine general purpose aircraft and helicopter, and our in-house designed and built full-motion flight simulator.

Students in the DARE course can also choose to sit for the Singapore Airworthiness Requirements (SAR) 66 basic papers conducted by the Civil Aviation Authority of Singapore (CAAS) as the curriculum contents for both are similar.

MAE works closely with the aerospace industry and the Civil Aviation Authority of Singapore (CAAS) to ensure the curriculum is relevant and robust. Our premier status has forged sturdy bonds with prestigious aerospace organisations including the Republic of Singapore Air Force, Singapore Airlines Engineering Company, Singapore Technologies Aerospace and Pratt & Whitney.

CAREERS AND FURTHER STUDIES

Graduates of the DARE course are well-positioned to be employed in the aerospace and aviation industry. Career opportunities include aircraft/component maintenance, design and development for aircraft modification, prototype and production testing, material requirements planning, project management, manufacturing and R&D.

Graduates also have the option of pursuing degrees at local and overseas universities. Besides advanced standing offered by NUS and NTU, the Singapore Institute of Technology (University of Glasgow) is offering eligible DARE graduates direct entry into the third year of its Bachelor of Engineering (Honours) in Aeronautical Engineering and Bachelor of Engineering (Honours) in Aerospace Systems.

COURSE MODULES

FULL-TIME	FIRST YEAR	HOURS
ET1200	Electrical Engineering Principles	60
ET1201	Electronic Engineering Principles	60
LC0554	Communicating for Personal & Team Effectiveness	30
LC8001	General Education 1	30
LC8002	General Education 2	30
ME1101	Mechanics I	60
ME1201	Computer-Aided Drafting	60
ME1021	Introduction to Engineering	90
ME1301	Engineering Materials I	60
ME1401	Thermofluids I	60
MS6140	Basic Mathematics	60
MS6161	Engineering Mathematics I	60
MS6508	Computer Programming	60

FULL-TIME	SECOND YEAR	HOURS
ET0176	Aircraft Electrical & Instrument Systems	60
LC0556	Communicating for Project Effectiveness	30
LC8003	Social Innovation Project	30
LC8004	General Education 3	30
ME2013	Aircraft Maintenance Practices	90
ME2101	Mechanics II	60
ME2201	Computer-Aided Design (Aeronautical)	60
ME2301	Engineering Materials II	60
ME2402	Aircraft Power Plants I	60
ME2501	Fundamentals of Flight	60
ME2511	Aircraft Structures	60
ME2802	Air Legislation & Management	60
MS6260	Engineering Mathematics II (A)	60
MS6261	Engineering Mathematics II (B)	60

FULL-TIME	THIRD YEAR	HOURS
ET0164	Avionic Systems	75
LC0557	Communicating for Professional Effectiveness	30
ME3101	Mechanics III	60
ME3301	Aerospace Materials	60
ME3402	Aircraft Power Plants II	90
ME3531	Aircraft Systems	90
ME3802	Quality Management (Aeronautical)	60
ME3803	Human Factors	60
IE5001	Project (22 weeks)	880
IC5001	Internship Programme (22 weeks)	880

Diploma in

Bioengineering

(DBEN)

Since the inception of the Biomedical Science Initiative in 2000, the Biomedical Science (BMS) sector has enjoyed buoyant growth in Singapore. Today, there are over 30 world-class medical technology and bio-manufacturing companies in Singapore.

The Diploma in Bioengineering (DBEN) course provides a balanced grounding in mechanical engineering and life sciences to help graduates develop skills essential to producing viable bioengineering solutions. This multi-disciplinary approach makes the DBEN a valuable asset to the rapidly advancing biomedical industry.

COLLABORATIONS AND PARTNERSHIPS

DBEN has close collaborations with the Singapore Health Services Pte Ltd, National Healthcare Group and Non-Governmental Organisations (NGOs) in human interface technology and assistive technology. DBEN students participating in such collaborations get to work closely with doctors and scientists to improve health standards and quality of life for the infirm.

CAREERS AND FURTHER STUDIES

Career opportunities in the biomedical science industry include manufacturing, testing and quality control of biomedical products, design and development of biomedical devices, maintenance and commissioning of biomedical equipment and systems.

Graduates also have the option of pursuing degrees at local and overseas universities. Many were offered advanced standing.

COURSE MODULES

FULL-TIME	FIRST YEAR	HOURS
ET1200	Electrical Engineering Principles	60
ET1201	Electronic Engineering Principles	60
LC0554	Communicating for Personal & Team Effectiveness	30
LC8001	General Education 1	30
LC8002	General Education 2	30
ME1021	Introduction to Engineering	90
ME1101	Mechanics I	60
ME1201	Computer-Aided Drafting	60
ME1301	Engineering Materials I	60
ME1401	Thermofluids I	60
MS6140	Basic Mathematics	60
MS6161	Engineering Mathematics I	60
MS6508	Computer Programming	60

FULL-TIME	SECOND YEAR	HOURS
CP2065	Introductory Anatomy & Physiology	45
CP2130	Laboratory Skills and Techniques	75
ET0180	Biomedical Equipment and Practices	60
ET0603	Biomedical Instrumentation	60
LC0556	Communicating for Project Effectiveness	30
LC8003	Social Innovation Project	30
LC8004	General Education 3	30
ME2022	Design & Build Medical Device	120
ME2101	Mechanics II	60
ME2102	Assistive Technology & Rehabilitation Engineering	60
ME2401	Thermofluids II	60
MS6262	Engineering Mathematics II	75

FULL-TIME	THIRD YEAR	HOURS
CP2064	General Biochemistry	60
LC0557	Communicating for Professional Effectiveness	30
ME3102	Biomechanics	60
ME3303	Biomaterials	60
ME3504	Biofluids	60
ME3503	Contamination Controls & Clean Room	60
ME8003	cGMP & Medical Device Validation	60
MS6231	Biostatistics	60
IE5001	Project (22 weeks)	880
IC5001	Internship Programme (22 weeks)	880

Diploma in

Mechanical Engineering

(DME)

The Diploma in Mechanical Engineering (DME) is the first full-time engineering diploma course offered in Singapore. Since 1958, it remains the de facto first-choice diploma course in mechanical engineering.

The DME course provides students with a firm foundation in a wide range of engineering disciplines. At the end of Year 2, students will apply for one of the six options:

- Aerospace Technology
- Energy Systems
- Facilities Management
- Machine Design
- Precision Engineering
- Product Realisation

COLLABORATIONS AND PARTNERSHIPS

MAE works closely with small and medium enterprises (SMEs), large multinational corporations (MNCs) and government agencies to design and manufacture products and services that meet operational and business needs.

CAREERS AND FURTHER STUDIES

Career opportunities abound in the aerospace, energy, precision engineering, electronics, machine and product design, engineering services, oil and gas, petrochemical, and hospitality industries.

Graduates also have the option of pursuing degrees at local and overseas universities. Many are offered advanced standing.

COURSE MODULES

FULL-TIME	FIRST YEAR	HOURS
ET1200	Electrical Engineering Principles	60
ET1201	Electronic Engineering Principles	60
LC0554	Communicating for Personal and Team Effectiveness	30
LC8001	General Education 1	30
LC8002	General Education 2	30
ME1021	Introduction to Engineering	90
ME1101	Mechanics I	60
ME1201	Computer-Aided Drafting	60
ME1301	Engineering Materials I	60
ME1401	Thermofluids I	60
MS6140	Basic Mathematics	60
MS6161	Engineering Mathematics I	60
MS6508	Computer Programming	60

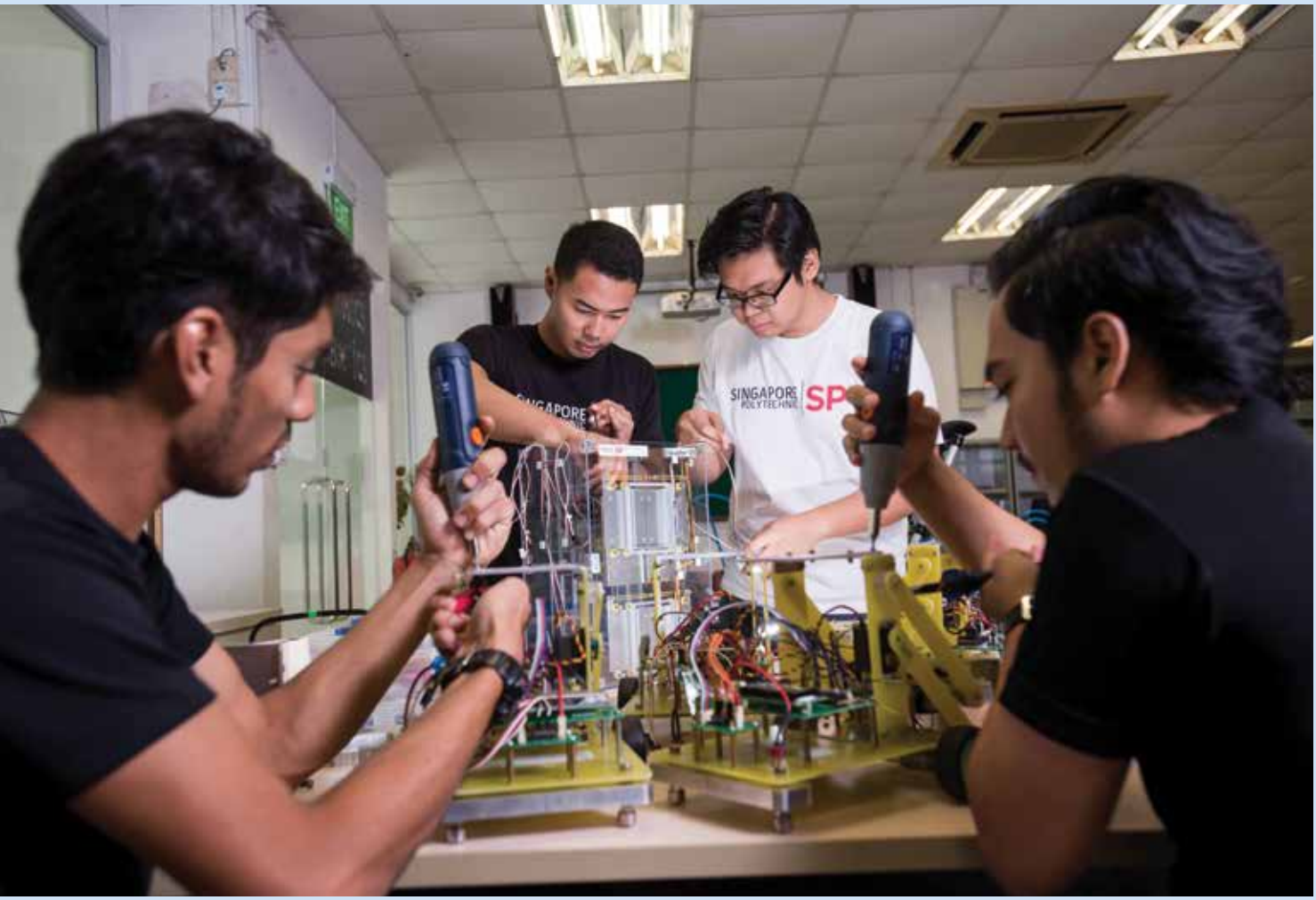
FULL-TIME	SECOND YEAR	HOURS
LC0556	Communicating for Project Effectiveness	30
LC8003	Social Innovation Project	30
LC8004	General Education 3	30
ME2011	Computer-Aided Machining	90
ME2021	Design and Build	120
ME2101	Mechanics II	60
ME2301	Engineering Materials II	60
ME2401	Thermofluids II	60
ME2601	Industrial Automation	60
ME2602	Instrumentation and Control	60
ME2801	Industrial Engineering	60
MS6260	Engineering Mathematics II (A)	60
MS6261	Engineering Mathematics II (B)	60

FULL-TIME	THIRD YEAR	HOURS
LC0557	Communicating for Professional Effectiveness	30
ME3101	Mechanics III	60
ME3401	Engineering Thermodynamics	60
ME3501	Fluid Mechanics	60
ME3801	Quality Engineering and Management	60
ME8001	Organisational Management	45
ME8002	Workplace Safety and Health Management	45
IE5001	Project (22 weeks)	880
IC5001	Internship Programme (22 weeks)	880
Aerospace Technology Option		
ME3301	Aerospace Materials	60
ME3531	Aircraft Systems	90
Energy Systems Option		
ME3421	Refrigeration and Air-conditioning	60
ME3422	Renewable Energy and Applications	60
Facilities Management Option		
ME3422	Renewable Energy and Applications	60
ME3901	Facilities Maintenance Engineering and Services	60
Machine Design Option		
ME3201	Tooling Engineering	60
ME3831	System Integration	60
Precision Engineering Option		
ME3001	Advanced Machining and Metrology	60
ME3201	Tooling Engineering	60
Product Realisation Option		
ME3222	Product Design and Development	60
ME3023	Ergonomics and Universal Design	60

Diploma in

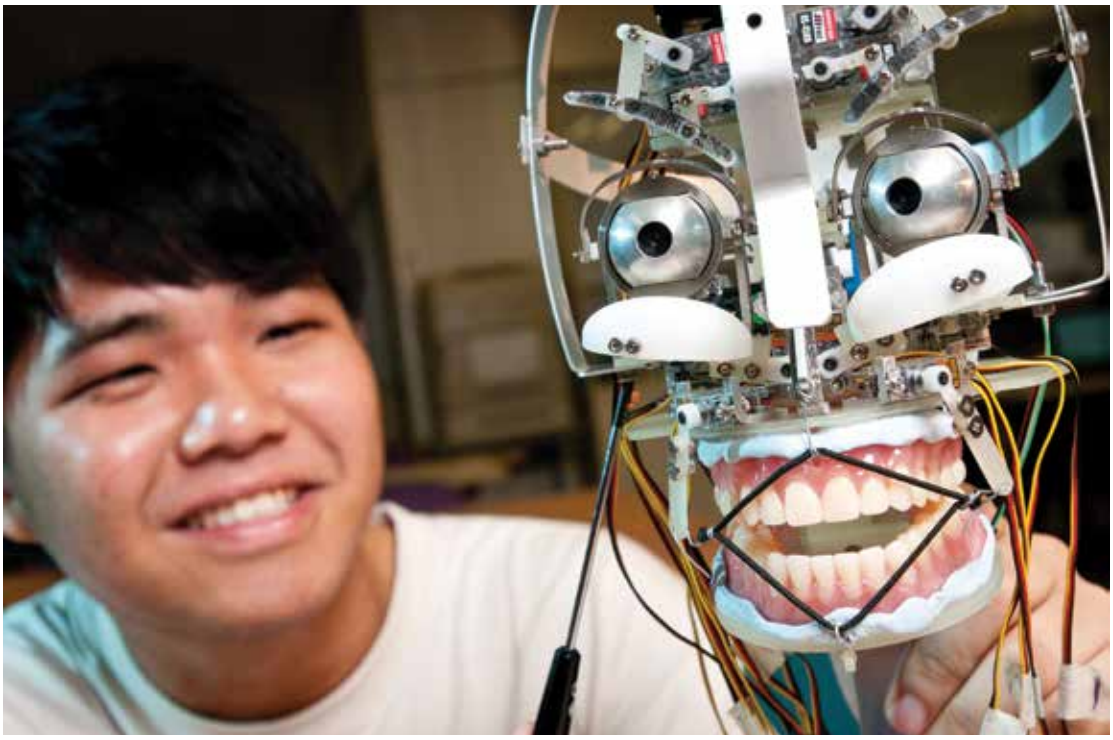
Mechatronics AND Robotics

(DMRO)



The Diploma in Mechatronics was first launched in 1991 to support manufacturing as a key engine of the Singapore economy. Subsequently, in 2010, the course was renamed the Diploma in Mechatronics and Robotics (DMRO) to reflect a curriculum that meets the evolving needs of the complex manufacturing industry. Today, of the 19 key industries listed by EDB, eight of them operates with multi-disciplinary technologies including Aerospace Engineering, Electronics, Engineering Services, Infocomm Products, Marine & Offshore Engineering, Medical Technology, Pharmaceuticals & Biotechnology and Precision Engineering.

The DMRO course is a multi-disciplinary study that integrates mechanical engineering with electronics and computer technology. It not only prepares graduates for the key industries but also emerging ones in Automotive, Nanotechnology and Space.



COLLABORATIONS AND PARTNERSHIPS

MAE works closely with small and medium enterprises (SMEs), large multinational corporations (MNCs) and government agencies to design and manufacture products and services to meet operational and business needs.

CAREERS AND FURTHER STUDIES

Career opportunities in the complex manufacturing industry include design, development, operation and management of multi-disciplinary systems, ranging from automation and robotics systems to micro-electromechanical systems in the aerospace, semi-conductor and petro-chemical industries.

Graduates also have the option of pursuing degrees at local and overseas universities. Many are offered advanced standing.

COURSE MODULES

FULL-TIME	FIRST YEAR	HOURS
ET1200	Electrical Engineering Principles	60
ET1201	Electronic Engineering Principles	60
LC0554	Communicating for Personal & Team Effectiveness	30
LC8001	General Education 1	30
LC8002	General Education 2	30
ME1101	Mechanics I	60
ME1201	Computer-Aided Drafting	60
ME1021	Introduction to Engineering	90
ME1301	Engineering Materials I	60
ME1401	Thermofluids I	60
MS6140	Basic Mathematics	60
MS6161	Engineering Mathematics I	60
MS6508	Computer Programming	60

FULL-TIME	SECOND YEAR	HOURS
EC1166	Design & Fabrication Project	120
EC1405	Electronics Devices	75
ET1010	Microcontroller Applications	90
LC0556	Communicating for Project Effectiveness	30
LC8003	Social Innovation Project	30
LC8004	General Education 3	30
ME2101	Mechanics II	60
ME2401	Thermofluids II	60
ME2601	Industrial Automation	60
ME2012	Computer-Aided Machining	60
MS6270	Statistics and Analytics for Engineers	60
MS6271	Engineering Mathematics II	60

FULL-TIME	THIRD YEAR	HOURS
EC1406	Circuit Theory	75
ET0163	Systems & Control	75
LC0557	Communicating for Professional Effectiveness	30
ME3602	Robotic Integration & Programming	60
ME3101	Mechanics III	60
ME3601	Programmable Logic Controllers	60
ME8001	Organisational Management	45
ME8002	Workplace Safety and Health Management	45
IE5001	Project (22 weeks)	880
IC5001	Internship Programme (22 weeks)	880

COMMON ENGINEERING PROGRAMME

(JOINTLY OFFERED WITH SCHOOL OF ELECTRICAL & ELECTRONIC ENGINEERING)

Refer to School of Electrical & Electronic Engineering for more information.

DIPLOMA IN ENGINEERING WITH BUSINESS

(JOINTLY OFFERED WITH SCHOOL OF ELECTRICAL & ELECTRONIC ENGINEERING AND SP BUSINESS SCHOOL)

Refer to School of Electrical & Electronic Engineering for more information.

DIPLOMA IN ENGINEERING SYSTEMS

(JOINTLY OFFERED WITH SCHOOL OF ELECTRICAL & ELECTRONIC ENGINEERING)

Refer to School of Electrical & Electronic Engineering for more information.

DIPLOMA IN ENGINEERING (AEROSPACE)

(PART-TIME)

For more information on Part-Time Diploma Courses, you may refer to **www.pace.sp.edu.sg**

DIPLOMA IN ENGINEERING (MECHANICAL TECHNOLOGY)

(PART-TIME)

For more information on Part-Time Diploma Courses, you may refer to **www.pace.sp.edu.sg**

TECHNOLOGY CENTRES & LEARNING LABORATORIES

There are 17 technology centres and learning laboratories in MAE. They provide students with hands-on experience and enhance theoretical understanding and knowledge. Major equipment and software are listed below.

AERO HUB

- A4SU Super Skyhawk aircraft
- Turboprop Aircraft
- Helicopter
- Wind Tunnels
- Control Input Simulator for unmanned aerial system training
- PID Simulator
- Full-motion Flight Simulator
- Aircraft Piston Engineer Models
- 4-Cycle Transparent Internal Combustion Engine
- Gas Turbine Test Engine Rig
- Welding facility
- Aircraft maintenance facility
- 3D Printers
- Cockpit Instrumentation System Trainer
- Laser cutter

THERMODYNAMICS LABORATORY

- Air compressor performance measurement
- Fluid energy measurement
- Heat engine and combustion test
- Heat transfer measurement
- Hydrostatic tester
- Steam plant measurement

BIOENGINEERING LABORATORY

- Blood pressure measurement (sphygmomanometer)
- DASYLab and ICATS software
- Force, pressure and displacement measurement
- High performance treadmill with cardiopulmonary exercise testing
- Isokinetic multi-joint evaluation and training
- Non-contact 3D body surface scanning
- Telemetric electromyography (EMG)
- Vibration measurement system
- Optical 3D motion capture system
- Algorithm development for tracking and rehabilitation assessment
- Biomechanics analysis using Adams and LifeMod software
- High-end, high-precision motion capture using Qualisys software
- Interactive floor projection using OptiTrack camera system
- Vivitro Pulse Duplicator
- Interactive game development working with Chroma Key technology and multi modal sensors
- Heart Simulator
- Inverted Microscope

CAE SIMULATION LABORATORY

- 3D modelling for product development
- AutoCAD, Autodesk Inventor Mimics bio-modelling
- CAE and Finite Element Analysis System

CNC MACHINE SHOP

- 2-axis CNC Turning
- 3-axis CNC Milling
- 5-axis CNC Turn-Mill applications
- CAD/CAM systems (CATIA, Autodesk Inventor, Pro-Engineer, SolidWorks and MasterCAM)
- High resolution CMM with 3D & PMI capabilities
- CNC 3-axis Mill (Campro CPV550)
- CNC Turn 310 (DMG Mori Eco)
- Gauges (block, dial, height, electronic, pneumatic)
- Micrometers (digital, 3-point) measurement
- Multi-gauging system measurement
- Optical profile projector and quick scope measurement
- Precision machining up to IT-7 standard
- CNC Lathe cum Mill (DMG CTX310)

ENGINEERING & PROJECT WORKSHOP

- Centre lathes
- Mini-radial arm and bench drilling
- Pressed brake bender
- Sheetmetal Shearing machines
- Universal milling machine
- Vertical band saw machines
- Router Machine
- Laser Cutting Machine
- Water-jet Cutting Machine
- CNC Milling Machine
- Sand Blasting Machine
- Spray Painting Booth
- 3D Printers

ENGINEERING WORKSPACE

- Bench and pillar type drilling machines
- Measuring instruments
- Surface grinders

FLUID MECHANICS LABORATORY

- Fluid friction measurement (pipes, valves, fittings)
- Pump characteristics test (centrifugal, plunger)
- Training sets (industrial hydraulics, electro hydraulics, proportional and servo valves)

INDUSTRIAL AUTOMATION & ROBOTICS LABORATORY

- Behaviour control programmer, Matrix Flowcode, Motion editor, Robot terminal, Robotino View software
- CX Programmer
- Digital oscilloscope
- Festo Robotino
- Matrix microcontroller development board
- Matrix HPACT actuators training panel
- Modular Production System
- Programmable Logic Controllers
- Robotis Bioloid expert robot kit
- Training sets (pneumatics, electro pneumatics, PLC)
- 3-in-1 Laser Plotter
- Handling Station with Robots

INTEGRATED PROJECT CENTRE

- 3D Studio Max product design software
- Roland SRP 3D rapid prototyping software
- Pro Concept 2D to 3D design software
- Cinema 4D software
- Windchill PD Solution software

MACHINE DEVELOPMENT CENTRE

- Solid-works CAD
- AutoCAD
- 3D Printers
- CNC Measurement Microscope System
- Troop Die-Sinking Electric Discharge Machine
- Super Drill EDM Machine
- Okamoto Surface Grinding Machine

MATERIALS LABORATORY

- Metallographic preparation of micro-specimens
- Powder preparation and characterisation
- Quantitative analysers: image, thermal, real-time X-ray
- Pendulum-type Charpy Impact Tester
- Ultrasound Inspection System
- Hot Press
- Sand blasting, powder spraying for thermal coating
- Scanning electron microscope
- Tensile, hardness, impact, non-destructive, wear, corrosion testing

MECHANICS LABORATORY

- Electrical strain gauge installation and calibration
- Load and friction measurement
- Mechanical vibration rigs and measurement
- PASCO, Lab View, MD Solids, Virtual Bench, Picoscope software
- Simple machines and power transmission elements
- Static and dynamic balancing rigs
- Stress measurement in beams, shafts and shells
- Whole-field stress determination system

QUALITY MANAGEMENT LABORATORY

- Design of experiment kits
- ISO Standards for Quality Management System
- JIT simulation game sets for scheduling
- QFD Designer v4.0 and SPC IV software
- SAP and MRP software
- Sound level and light meters for ergonomics study
- Statistical control charting kit
- Time study videos and timing exercises

RAPID PROTOTYPING LABORATORY

- 3D Z-Printer 450 rapid prototyping machine with de-powdering unit
- Fortus 360mc rapid prototyping machine and Insight software
- Kevvox desktop 3D Printer and K-Studio software
- Mojo 3D Printer

REFRIGERATION & AIR-CONDITIONING LABORATORY

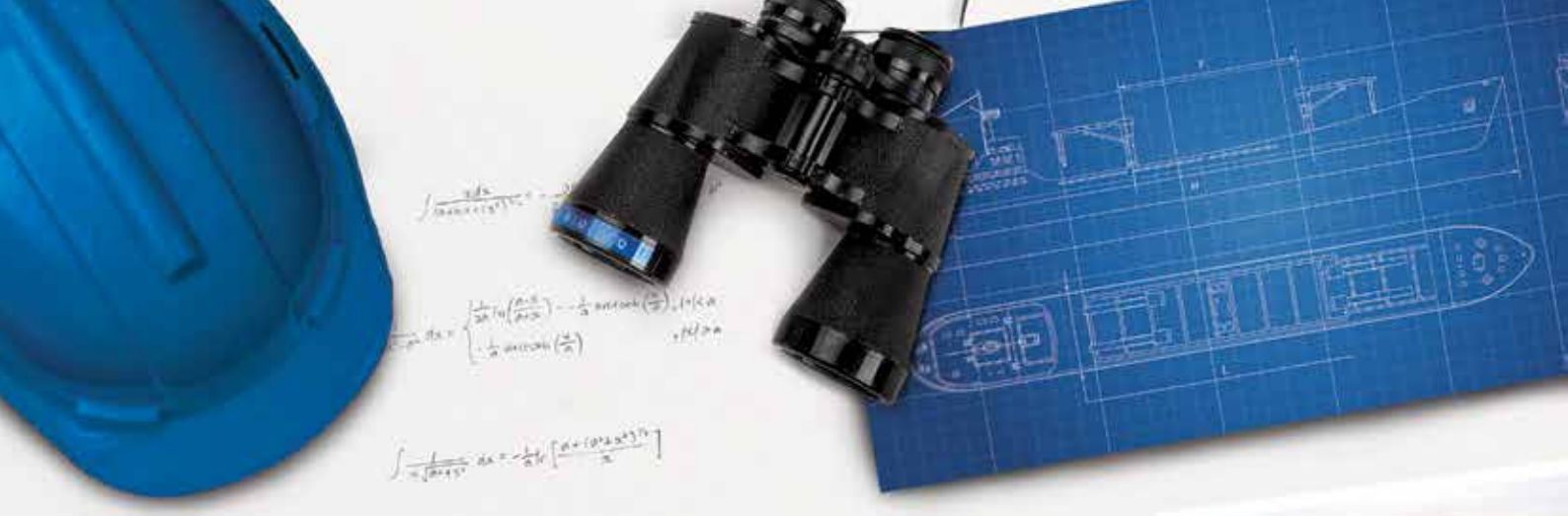
- Ductwork and building automation systems
- Laser particle counter
- Manometers, anemometers and sound meters
- Room air-conditioners and refrigerators

PLANT ENGINEERING LABORATORY

- Borescope inspection systems
- Mechanical Lift Training System
- Motion simulators
- Noise measurement
- Oil analysis and particle measurement
- Plant maintenance, condition monitoring, industrial safety and health software
- Shaft and pulley alignment with laser
- Vibration measurement and spectrum analysis
- Vibration scanning and balancing

COMPOSITE TECHNOLOGY LABORATORY

- Composite Technology Laboratory
- Water-jet Cutting Machine
- CNC Router
- CNC Stitching Machine
- ISIS1100 Shearography System
- Fibre Placement Machine
- Vibration Monitoring Analyser
- Vacuum Resin Transfer Molding System



SINGAPORE Maritime Academy

MARITIME BUSINESS

MARINE ENGINEERING

NAUTICAL STUDIES

With SP, it's So Possible

SMA
Singapore Maritime Academy
SINGAPORE POLYTECHNIC

Singapore Maritime Academy's role is to produce competent personnel to meet the manpower requirements of the maritime and transportation industries and their associated shore-based supporting infrastructure. Currently, there is an acute shortage of such qualified personnel. To achieve this, the academy provides educational and training courses at both Diploma and Certificate of Competency levels. The academy also offers a wide range of short courses and tailor-made courses to meet the training needs of the maritime industry.

The diploma courses aim to produce graduates with broad-based experience, a multi-disciplinary approach in problem solving, and positive attitudes towards work and personal growth.

The Certificate of Competency courses are designed for experienced marine engineers and deck officers to prepare them for their professional licences. These courses are also modularised and serve as extensions to their respective diploma programmes.

** All full-time diploma students are required to take two compulsory Education and Career Guidance Modules in SP. Students will take SP101A: Education and Career Guidance 1 – Personal Development (15 hours) in their first year. In their second or third year, students will take SP201A: Education and Career Guidance 2 – Career Development (30 hours).*

** All students are required to take one compulsory Sports for Life (SFL) module for one semester in their first year in SP. In their second and third year, students may sign up for SFL module as an elective.*

Diploma in

Marine Engineering

(DMR)

The Diploma in Marine Engineering (DMR) is a three-year full-time course which includes a 6-month structured internship programme with approved establishments, locally or overseas. The course structure is modularised to enhance learning and to provide flexibility to meet the training needs of the maritime industry.

CAREER PROSPECTS

Marine engineers are managers of complex power plants and systems. Marine engineers operate, maintain, repair and manage large engineering power systems. The diploma programme is designed to train our students to a level of competency whereby they are able to handle independently a wide range of engineering problems which require knowledge from multiple disciplines. Upon graduation, you can join a modern foreign-going ship and progress in stages from junior to chief engineer by qualifying for Certificates of Competency issued by the Maritime and Port Authority of Singapore (MPA). The profession of a marine engineer is a challenging one that comes with good monetary rewards. Because of the broad-based experience and early responsibility gained as a ship's engineer, you will also be well sought after in diverse shore-based industries. There are many further education opportunities with local and foreign universities to advance your career.

Under the Singapore Institute of Technology (SIT) – Polytechnics partnership, supported by Ministry of Education, Diploma in Marine Engineering graduates may read the Bachelor of Engineering in Marine Technology, with Honours in Marine Engineering, Offshore Engineering, or Naval Architecture degree awarded by Newcastle University (UK) locally in two years.

PRACTICAL TRAINING

The structure of the diploma programme provides for this in two ways:

- Through intensive training in our fully equipped workshops, simulators and laboratories specifically designed for hands-on learning.
- Through a structured 6-month Internship Programme with approved industrial organisations. In addition, mandatory safety courses in Fire Fighting and Fire Prevention, Personal Survival Techniques, Elementary First Aid, Personal Safety and Social Responsibility and Maritime Security Awareness are conducted during the course.

ASSESSMENT

Students' performance and progress are evaluated through a combination of in-course and end-of-semester assessment. Each module is assessed according to its aims and objectives and may take the form of written and practical examinations, assignments, projects and oral presentations. A satisfactory standard must be attained during the Industrial Training Programme.

COURSE MODULES

FULL-TIME	FIRST YEAR	HOURS
LC8001	General Education 1	30
LC8002	General Education 2	30
MA1113	Applied Mechanics	60
MA1061	W/S Practice I	60
MA1116	Engineering Drawing	60
MA1064	W/S Practice II	60
MA1071	Instrumentation	60
MA1114	Electric Circuits	60
MA1115	Basic Thermodynamics	60
MA1108	Marine Engineering Knowledge I	60
MA1117	Naval Architecture I	60
MA1112	Basic Occupational Safety & Security Training	60
MS7102	Basic Mathematics	60
MS7202	Engineering Mathematics I	60

FULL-TIME	SECOND YEAR	HOURS
LC8003	Social Innovation Project	30
LC8004	General Education 3	30
MA1118	Engineering Mechanics	60
MA1119	Integrated Workshop Practice	60
MA1073	CAD	75
MA1080	Auxiliary Machinery	75
MA1082	Integrated Control	75
MA1092	Electronics	60
MA1120	Applied Thermodynamics	60
MA1104	Naval Architecture II	75
MA1069	Marine Engineering Knowledge II	60
MS7302	Engineering Mathematics II	45
MA1121	Marine Engine Room Simulation Training	60
LC0656	Communicating For Project Effectiveness (Report)	

FULL-TIME	THIRD YEAR	HOURS
IF9002	Internship Programme	
MA1077	Marine Workshop Practice	75
MA1094	Electrical Machines & Systems	75
MA1124	Marine Power Plant	75
MA1126	Software Application for Naval Architecture	45
MA0568	Basic Tanker Training	75
LC0657	Communicating for Professional Effectiveness	30

Diploma in

Maritime Business

(DMB)

Singapore is the world's busiest seaport and one of the world's largest container ports. The government is committed towards making Singapore a premier maritime centre of excellence. Hence we have many maritime and logistics related organisations based here which are involved in a wide range of shipping business activities. These organisations require a pool of relevant shore-based maritime management and logistics experts to run their businesses. The main aim of the Diploma in Maritime Business (DMB) is to serve the needs of such organisations.

CAREER PROSPECTS

Graduates of this diploma are most sought after by companies offering shipping services. These include ship management, logistics, ship owning, shipbrokering, ship agency, freight forwarding, marine insurance, ship chartering, maritime law firms and also MPA and PSA. They will join this diverse and rapidly growing maritime industry as junior executives. There are tremendous prospects for upward career mobility with experience and professional enhancement. Many graduates continue with their education by enrolling in degree programmes conducted by local and overseas universities.

PRACTICAL TRAINING

This diploma is designed to be practical oriented. The link between theory and practice is achieved through hands-on work, practical exercises, case studies, industrial attachment and field visits. Students will be taught by experienced and qualified staff and will receive hands-on training on Portnet, Tradenet and the latest ship management and logistics software application programmes. Practitioners from the shipping industry are invited to give talks to students from time to time and field visits are arranged when necessary. The 6-month shore-based enhanced internship programme is carefully planned and closely monitored by in-house company supervisors and academic staff. This exposure provides students with a first-hand experience of working in maritime related or logistics organisations in Singapore.

ASSESSMENT

Modules are assessed by means of in-course assessments.

COURSE MODULES

FULL-TIME	FIRST YEAR	HOURS
Stage 1A		
MA0110	Ship Operations	60
MA0125	Introduction to Maritime Industry	60
MA0083	Financial Accounting in Shipping	60
MA0100	Marine Engineering Knowledge	45
MA0103	Maritime Personnel Management	45
MA0112	Logistics Management	60
LC8001	General Education 1	30
Stage 1B		
MS7124	Business Statistics	60
MA0059	Maritime Economics	75
MS7524	IT and Data Analysis for Business	60
MA0113	Port Operations	60
LC0654	Communicating for Personal & Team Effectiveness (CPE)	30
MA0119	Bunkering Practices	45
LC8002	General Education 2	30

FULL-TIME	SECOND YEAR	HOURS
Stage 2A		
MS7224	Business Data Analytics	60
MA0114	Port Agency	45
MA0090	Financial Management in Shipping	60
MA0115	Law of Carriage of Goods by Sea	60
MA0116	Port Management	60
LC0658	Communicating for Project Effectiveness (CPR)	30
LC8003	Social Innovation Project (SIP)	30
Stage 2B		
IF9001	Enhanced Internship	

FULL-TIME	THIRD YEAR	HOURS
Stage 3A		
MA003Y	Project	30
MA0117	Supply Chain Management	75
MA0118	Health Safety Security and Environmental Management	45
MA0120	Marine Insurance	45
MA0121	Marine Offshore Operations	45
MA0124	Ship Broking and Chartering	60
MA0126	Ship Financing	45
Stage 3B		
MA003Z	Project	30
MA0105	Ship Management	60
MA0093	Marketing of Shipping Services	60
MA0122	Electronic Commerce	90
MA0123	Maritime Law	45
LC0657	Communicating for Professional Effectiveness (CPE)	30
LC8004	General Education 3	30

Diploma in

Nautical Studies

(DNS)

This dynamic training programme prepares students for the Diploma in Nautical Studies (DNS) and their first professional sea-going qualification — the Class 3 (Deck Officers) Certificate of Competency. It is the first career step for the holder to sail as a junior deck officer, and progressing to be a Master of a merchant ship.

CAREER PROSPECTS

Each ship requires a Captain and three navigating officers. Candidates completing DNS will qualify to be a Second Officer onboard a merchant vessel, provided they have sufficient sea service and pass an Oral Examination conducted by MPA. This examination leads to the award of a Class 3 (Deck Officers) Certificate of Competency, which is internationally recognised. The scheme comprises of three phases.

PHASE 1

This three-semester Pre-Sea Induction Course at SP prepares students as cadet officers aboard ship. Students are taught the fundamental knowledge and skills required for a deck officer. During this period, the student attends an approved STCW Basic Occupational Safety and Security course. The student will also be required to attend an approved STCW Medical First Aid on Board Ship course as an ancillary.

PHASE 2

During this phase, the students undergo shipboard training following a structured training programme, which includes a correspondence course package and the completion of a training and assessment record book. As cadet officers, students are groomed to shoulder the responsibilities of a Navigating Officer. A minimum sea service of 12 months is required for the award of DNS and the Class 3 (Deck Officers) Certificate of Competency.

PHASE 3

This final phase of study (one semester) for the DNS course includes the Class 3 (Deck Officers) Certificate of Competency Preparatory Course. The curriculum includes Electronics Navigation Systems and GMDSS.The holder of the diploma may be granted exemption from the written part of the Class 3 Certificate of Competency examination conducted by MPA Singapore.

ASSESSMENT

Modules in Phase 1 and 3 will be assessed either in-course and/or by means of semestral examinations.

COURSE MODULES

FULL-TIME	FIRST YEAR	HOURS
Phase 1A		
MA0556	Meteorology	45
MA0539	Principles of Navigation	60
MA0555	Ship Knowledge	120
MS7442	Science I	45
MS7542	Software Applications	30
LC8001	General Education 1	30
Phase 1B		
MA0570	Basic Occupational Safety and Security Training	120
MA0536	Introduction to Navigation	75
MA0558	Marine Communications and Signals	75
MS7141	Mathematics I	30
MA0560	Collision Regulations	45
LC8002	General Education 2	30

FULL-TIME	SECOND YEAR	HOURS
Phase 2A		
MA0534	Advanced Fire-Fighting	30
MA0568	Basic Tanker Training	75
MA0559	Electronic Navigation Systems I	90
MS7341	Mathematics II	45
MA0561	Marine Offshore Operations	37.5
MS7452	Applied Science	60
LC8003	Social Innovation Project	30

Stage 2B

During this phase, the candidates undergo shipboard training with a STCW approved Training and Assessment Record Book and follow a distance learning programme. Candidates are required to complete a total of 12 months sea service to proceed to DNS Phase 3B and to enrol for the Class 3 Certificate of Competency examination.

FULL-TIME	THIRD YEAR	HOURS
Phase 3A		
MA0562	Cargo Work & ISM	37.5
MA0543	Coastal Navigation	52.5
MA0563	Electronic Navigation Systems 2	15
MA0564	GMDSS	82.5
MA0542	Practical Navigation	75
MA0565	Ship Construction and Ship Stability	52.5
MA0525	Ship Operations	97.5

DIPLOMA (CONVERSION) IN
SHIPPING OPERATIONS & MANAGEMENT
(PART-TIME)

This course aims to equip non-maritime and logistics graduates with knowledge and skills in shipping operations and logistics management so that they can join the maritime industry as senior executives/junior managers and perform their jobs with a greater level of competence and understanding. They will also have brighter prospects for upward career mobility after gaining adequate experiences and/or further academic qualifications.

ASSESSMENT
Modules are assessed by means of in-course assessments.

COURSE MODULES

CANDIDATES MUST SUCCESSFULLY COMPLETE THE FOLLOWING MODULES AT SMA		HOURS
Semester 1		
MA5020	Maritime Economics and Shipbroking	45
MA5021	Maritime Law and Insurance	45
MA5022	Port and Caargo Management	45
Semester 2		
MA5023	Marketing and Financial Management	45
MA5024	Ship Management and Offshore	45
MA5025	Supply Chain Management	45

One course intake per year in October.
For more information on Part-Time Diploma Courses, you may refer to **www.pace.sp.edu.sg**

DIPLOMA (CONVERSION) IN
MARITIME BUSINESS MANAGEMENT
(PART-TIME)

This course aims to equip non maritime graduates with knowledge and skills in shipping operations and logistics/offshore management so that they can join the maritime industry as senior executives/junior managers and perform their jobs with a greater level of competence and understanding. They will also have brighter prospects for upward career mobility after gaining adequate experiences and/or further academic qualifications.

ASSESSMENT
Modules are assessed by means of in-course assessments.

COURSE MODULES

CANDIDATES MUST SUCCESSFULLY COMPLETE THE FOLLOWING MODULES AT SMA		
Students will choose either PDC2A or PDC2B in Semester 2, but only one PDC will be offered depending on the sign up rate.		
Semester 1		
PDC1: Certificate in Shipping Business and Operations		
MA5080	Maritime Economics and Shipbroking	45
MA5081	Maritime Law and Insurance	45
MA5082	Port and Cargo Management	45
Semester 2		
PDC2A: Certificate in Ship Management and Logistics		
MA5083	Marketing and Financial Management	45
MA5084	Ship Management and Surveying	45
MA5085	Supply Chain Management	45
PDC2B: Certificate in Ship Management and Offshore		
MA5083	Marketing and Financial Management	45
MA5084	Ship Management and Surveying	45
MA5086	Marine Offshore Operations	45

Two course intake per year in April and October.
For more information on Part-Time Diploma Courses, you may refer to **www.pace.sp.edu.sg**

PROFESSIONAL CERTIFICATE OF
COMPETENCY COURSES

Part-time courses for Deck Officers and Marine Engineers of the Merchant Navy. The courses lead to the award of internationally recognised Certificates of Competency issued by the MPA. All prospective candidates for these courses are advised to get their sea time and relevant testimonials assessed and eligibility confirmed by the Shipping Division, MPA, prior to enrolment into the course. All courses meet 2010 Manila Amendments to STCW Convention.

Director, Shipping Division, Maritime and Port Authority of Singapore
460 Alexandra Road, #21-00
PSA Building,
Singapore 119963.
Tel: (65) 6375 6222
Fax: (65) 6375 6231
www.mpa.gov.sg

PREPARATORY COURSE CLASS 1 (DECK OFFICER)
Certificate of Competency (CoC)

This 4-week course prepares the candidate for the CoC Class 1 Deck Officer Orals examination conducted and approved by MPA.

Course Duration: 4 weeks
Course Intake: 2018: Every alternate month starting from January
Course Fees: S$2,407.50 (including 7% GST but excluding S$300 for Orals and Simulator-Aided Examination Fees conducted by MPA)

COURSE MODULES
Module 1 Ship Handling – Simulator
Module 2 Oral Assessment Support

ASSESSMENT
Candidates will be assessed by MPA in the CoC Class 1 Oral Examination.

ENTRY REQUIREMENTS
Candidates must:
- have completed their Class 1 & 2 Deck written examinations conducted by SMA (approved by MPA)
- be in possession of a CoC Class 2 Deck Officer (approved by MPA)
- meet the sea service requirements of MPA for the issue of the CoC Class 1 Deck Officer.

For enquiry of sea-service, candidates are advised to write to:
Training Standards Department
Training Division Maritime and Port Authority of Singapore
460 Alexandra Road, #21-00
PSA Building,
Singapore 119963.
Tel: (65) 6375 6222
Fax: (65) 6375 6231
Email: **coc@mpa.gov.sg**

CLASS 1 & 2 (DECK OFFICER)
Certificate of Competency (CoC)

This is a full-time 20-week (five months) combined Class 1 & 2 Deck Officers course. It will lead to Class 1 & 2 CoC, issued by MPA upon successful completion of written examinations at SMA and oral examinations at MPA. The course meets the requirements of latest STCW convention and is highly recognised by the international shipping industry. There are two intakes per year, in April and October. Besides the main course contents and written examinations, the following mandatory short course is included:
- Navigation Control Course Candidates have to enrol to attend the following mandatory courses:
- Shipboard Training & Assessment Course
- Medical Care Onboard
- Advanced Fire-Fighting (**All candidates who completed this course at Class 3/2 Deck Officer CoC level will be exempted.)

Course Duration: 5 months
Course Intake: April and October
Course Fees: S$11,110 including 7% GST (subject to revision)

ASSESSMENT
Modules will be assessed either in-course and/or by means of semestral examinations.

ENTRY REQUIREMENTS
CoC Class 3 Deck Officer or equivalent.

SEA SERVICE REQUIREMENTS
36 months from Class 3 or watch keeping level to Class 1; OR 12 months from Class 3 to Class 2 and 24 months thereafter; OR 12 months after Class 2, if sailed as chief officer immediately after Class 2, otherwise sea service is pro-rated.

COURSE MODULES

CANDIDATES MUST SUCCESSFULLY COMPLETE THE FOLLOWING MODULES AT SMA	
MA2020	Navigation
MA2022	Ship Handling & Simulator
MA2023	Marine Plant & Propulsion
MA2024	Cargowork
MA2026	Maritime Law & Personnel Management
MA2027	Meteorology
MA2028	Compass
MA2029	Ship Stability
MA2030	Ship Construction

CLASS 3 (DECK OFFICER)
Certificate of Competency (CoC)

This is a full-time course of 18 weeks. The course meets the requirements of latest STCW convention and is highly recognised by the international shipping industry. There are two intakes per year, in April and October. Candidates need to successfully complete the written examinations conducted by SMA and pass the orals conducted by MPA for the award of CoC Class 3 Deck Officer.

Course Duration: 18 weeks
Course Intake: April and October
Fees: S$10,150 including 7% GST (subject to revision)

ASSESSMENT
Modules will be assessed either in-course and/or by means of semestral examinations.

ENTRY REQUIREMENTS
Sea Service Requirements — It is open to candidate with the requisite 36-month sea time or as approved by MPA.

COURSE MODULES

CANDIDATES MUST SUCCESSFULLY COMPLETE THE FOLLOWING MODULES AT SMA	
MA0525	Ship Operations
MA0542	Practical Navigation
MA0543	Coastal Navigation
MA0545	Meteorology
MA0562	Cargo Work & ISM
MA0565	Ship Construction & Ship Stability
MS7341	Mathematics II
MS7452	Applied Science

COC 3 ON-LINE COURSE
Phase 1 (e-learning)/A part of CoC3 Preparatory Course

This programme is designed for local and international deck personnel aspiring to become Junior Deck Officers. By doing this course, the student can reduce in-campus time to 8 weeks preparatory course. (Otherwise the student will have to complete 15 weeks in-campus course). On successful completion of this course, the student will enrol in Phase II in the next available batch of 8-weeks of 'in-campus course' at SMA.
The e-Learning programme allows you to work at your own pace right from the comfort of your home.

SUITABLE FOR
Candidates appearing for Class 3 Deck Officers Certificate of Competency in Singapore.

ASSUMED SKILLS AND KNOWLEDGE
A candidate must fulfill all the following requirements:
- A basic high school qualification with a proficiency in English language
- Sea time must be completed on the ships of more than 3,000 GT engaged in International voyages
- Must have completed at least 18 months of sea time in Deck department (as A/B, O/S or Deck cadet only)

(Candidates are to obtain the 'Letter of Eligibility' (LOE) from MPA, themselves to enrol for in-campus Phase II training. This is an on-line application which may be submitted via MPA Singapore website, **www.mpa.gov.sg**)

COURSE OUTLINE
Once you have enrolled, you will receive an email notifying you of your login details. Use your login details to log into the site. Click on the 'myLearning' tab in the home page to access your courses.

Course covers the following modules, as required by STCW regulation:
- General Ship Knowledge
- Navigation
- Coastal Navigation
- Meteorology
- Mathematics
- Science

MODE OF ASSESSMENT
On-line assessment
Each course has a 'Practice Test' in the assessment section. On completion of the course, you can take this sample test to refresh your learning, and to prepare for your final assessment. This will help you assess your understanding of the course.

On submission of the test, you will receive a complete feedback for the same. This test does not have any pass percentage. To complete the programme successfully, the student has to take a scheduled test for each course. You have to score at least 70% in order to pass a test. Each test consists of 'multiple choice questions', each question has to be answered within two minutes.

During the course, whenever an assessment is conducted, you will be notified about the assessment statistics via email. You have a maximum of three attempts to pass the final tests, failing which you have to re-apply for the test through your e-mentor, by paying an examination fee of $100 USD.

CERTIFICATION
On successful completion of the programme, a programme completion certificate will be issued jointly by SMA and TMS. Certificates will not be issued for individual courses.

APPLICATION PROCEDURE
Apply through PACE website,
www.pace.sp.edu.sg

PHASE 2 (IN-CAMPUS)/A PART OF COC 3 PREPARATORY COURSE
By doing this course, the student can reduce in-campus time to 8 weeks preparatory course. (Otherwise the student will have to complete 15 weeks in-campus course).

ASSUMED SKILLS AND KNOWLEDGE
A candidate must fulfill all the following requirements:
- A basic high school degree with a proficiency in English language
- Sea time must be completed on the ships of more than 3,000 GT engaged in International voyages
- Must have completed at least 36 months of sea time in Deck department (as A/B, O/S or Deck cadet only)
- Passed the in-campus assessment conducted by SMA
- Holding a successful 'Letter of Eligibility' (LOE) issued by MPA

COURSE OUTLINE
Course covers the following modules, as required by STCW regulation:
- General Ship Knowledge
- Navigation
- Coastal Navigation
- Meteorology
- Mathematics
- Science

MODE OF ASSESSMENT
All the written examinations and 'Orals and Simulator Examination' are conducted by MPA.

CHIEF MATES
(Special Limits Course)

PHASE 1
This is a full-time 15-week course. This course is designed as per the requirements given by MPA in consultation with National Trade Union Congress (NTUC), Employment and Employability Institute (e2i) and Singapore Shipping Association(SSA).

The course will help to meet the job demand in Bunker Tankers and other crafts operating within Special Limits in and around Singapore waters.

Course Duration: 15 weeks
Course Intake: April and October (as decided by participating organisations viz MPA, e2i, SSA)
Course Fees: S$6,000 + 7% GST (subject to revision)

ASSESSMENT
Modules will be assessed by in-course assessment.

ENTRY REQUIREMENTS
Candidates as selected by MPA, e2i and SSA.

PHASE 2
This will be on-board training for 18 months with the Employers and students will complete 'e-learning' and 'TARB' book.

PHASE 3
This will be a full-time 15-week course to be conducted at SMA. On completion of Phase 3 at SMA, candidates will undergo 'Orals and Simulator Assessment' by MPA for their final certification.

PHASE 4
This will cover all mandatory STCW short courses under Manila Amendments to STCW convention.

MASTER
(Special Limits Course)

This is a full-time 8-week course. This course is designed as per the requirements given by MPA for students who have completed 24 months sea time after Chief Mates Special Limit CoC.

The course will help to meet the job demand in Bunker Tankers and other crafts operating within Special Limits in and around Singapore waters.

Course Duration: 8 weeks
Course Intake: January and July
Course Fees: S$9,600 + 7% GST (subject to revision)

ASSESSMENT
Modules will be assessed by written examination and in-course assessment as decided by MPA.

ENTRY REQUIREMENTS
Candidates who have completed 24 months of sea time after Chief Mates Special Limits Course.

MARINE ENGINEER OFFICER CLASS 5
(Special Limits Course)

PHASE 1
This is a full-time 15-week course. This course is designed as per the requirements given by MPA in consultation with National Trade Union Congress (NTUC), Employment and Employability Institute(e2i) and Singapore Shipping Association (SSA).

The course will help to meet the job demand for marine engineers in Bunker Tankers and other crafts operating within Special Limits in and around Singapore waters.

Course Duration: 15 weeks
Course Intake: April and October (as decided by participating organisations viz MPA, e2i, SSA)
Course Fees: S$14,000 + 7% GST (for 3 Phases)

ASSESSMENT
Modules will be assessed by in-course assessment.

ENTRY REQUIREMENTS
The entrants to this course are required to have a minimum of any one of these qualifications:
- NITEC/Higher NITEC in Mechanical Technology
- NITEC/Higher NITEC in Marine & Offshore Technology
- NITEC in Automotive Technology (heavy vehicles)
- NITEC in Facility Technology
- Relevant qualification approved by the Director Maritime & Port Authority of Singapore

For male candidates, they must have completed or be exempted from National Service

PHASE 2
This will be on-board training for six months with the Employers and students will complete 'e-learning' and 'TARB' book.

PHASE 3 (7 weeks)
Attends Certificate of Competency Marine Engineer Officer Class 5 Special Limits Preparatory Course for Written and Oral Examinations.

Candidates must pass the Phase 1 training before they can proceed to Phase 3.

MARINE ENGINEER OFFICER CLASS 4
(Special Limits Course)

This is a full time 8-week course. It is designed to provide an avenue for the graduates of Marine Engineer Officer Class 5 Special Limits candidates to progress to a higher position as Chief Engineer on board ships plying within Special Limits waters stipulated by Maritime Port Authority of Singapore (MPA).
Course Fees: $9600.00

ENTRY REQUIREMENTS
The minimum entry standard requirement to Marine Engineer Officer Class 4 Special Limits (MEO 4 SL) Certificate of Competency (CoC) Course is as follows:
- Candidate who holds a Marine Engineer Officer Class 5 Special Limits Certificate of Competency (CoC) issued by MPA

and

- Candidate who have completed a minimum of 24 months shipboard service after holding a Marine Engineer Officer Class 5 Special Limits Certificate of Competency (CoC)

For male candidates, they must have completed or be exempted from National Service.

COURSE MODULES

CANDIDATES MUST SUCCESSFULLY COMPLETE THE FOLLOWING MODULES AT SMA	
Module 1	Engineering Knowledge
Module 2	Naval Architecture and Ship Construction
Module 3	Marine Electrical Practice
Module 4	Engine Room Simulator Exercises and STCW mandatory courses

ASSESSMENT
Candidates must pass the Engine Room Simulator Assessment and Written Examination on Module 1, 2 & 3 above.

CLASS 1 & 2 (MARINE ENGINEER)
Certificate of Competency (CoC) Part A

Part A level at SMA to qualify for the issuance of Class 2 Engineer and/or Class 1 Engineer CoC, if not exempted by MPA, Singapore:
- MA3024 Marine Engineering Drawing & Design
- MA3025 Mathematics
- MA3026 Mechanics
- MA3027 Heat

This Certificate of Competency (CoC) Class 1 & 2 (Part A) course is offered as a Distance Learning Programme (DLP)
Course Fees: S$940.00 + 7% GST †
† Course fees subject to change

ENTRY REQUIREMENTS
Sea Service Requirements — It is open to candidates as approved by MPA.

CLASS 1 & 2 (MARINE ENGINEER)
Certificate of Competency (CoC) Part B

This CoC Class 1 & 2 Marine Engineer Officers course will lead to Class 1 & 2 Certificate of Competency (CoC), issued by MPA, upon successful completion of written examinations at SMA and oral examinations at MPA. Courses meet the requirements of STCW 2010 Convention of IMO.

Course Duration: 5 months
Course Intake: April and October
Course Fees: S$11,110 including 7% GST
The course fees will cover the main courses and written examinations.

Candidates need to pay for the following mandatory and other courses:

- Medical Care Onboard (Fees: S$299.25)†
- Advanced Fire-Fighting (Fees: S$525.00)†**
- CoC 2 & 1 Part A (Fees: S$940.00 + 7% GST)†, if not exempted

† Course fees subject to change
** All candidates who have completed this course at Class 5 Engineer CoC level will be exempted.

ASSESSMENT

Modules will be assessed either in-course and/or by means of written examinations.

ENTRY REQUIREMENTS

Diploma in Marine Engineering or its equivalent and CoC Class 5 Marine Engineer Officer or its equivalent from a recognised maritime administration acceptable to MPA Singapore.

SEA SERVICE REQUIREMENTS

18 months after CoC Class 5 Marine Engineer Officer or its equivalent to qualify for CoC Class 2 Marine Engineer Officer 18 months after Class 2 Engineer CoC to qualify for Class 1 Engineer CoC.

COURSE MODULES

CANDIDATES MUST SUCCESSFULLY COMPLETE THE FOLLOWING MODULES AT SMA

MA3016	Engineering Knowledge Motor
MA3017	Engineering Knowledge General
MA3018	Electrotechnology & Electronics
MA3022	Naval Architecture and Ship Construction

PREPARATORY COURSE

Class 1 (Marine Engineer) Certificate of Competency (CoC)

This 4-week course prepares the candidate for the CoC Class 1 Marine Engineer Officer Orals examination conducted by MPA. It also aims to develop competence to take on the responsibility of a Chief Engineer of a ship in accordance with STCW 2010 Convention.

Course Duration: 4 weeks
Course Intake: Once every 2 months
Course Fees: $1,735 + 7% GST. Oral exam fees of about $175 to be paid to MPA.

ASSESSMENT

Candidates will be assessed by MPA in the CoC Class 1 Oral Examination.

ENTRY REQUIREMENTS

- Completed the CoC 1 & 2 Engineer Course at Singapore Maritime Academy and in possession of a CoC Class 2 Marine Engineer Officer Certificate as issued by MPA.
- Approved sea-going service on ships powered by main propulsion machinery of 3,000kW propulsion power or more.
- Eligible to appear for CoC Class 1 Marine Officer Engineer orals.

COURSE MODULES

CANDIDATES MUST SUCCESSFULLY COMPLETE THE FOLLOWING MODULES AT SMA

- Marine Engineering at the Management Level
- Electrical, Electronic and Control Engineering at the Management Level
- Maintenance and Repair at the Management level
- Controlling the Operation of the Ship and Care for Persons Onboard at the Management Level
- Monitor and control compliance with legislative requirements

COC 5 E-LEARNING (MARINE ENGINEER)

Certificate of Competency (CoC)

This is a web-based self-learning course for anyone who wants to know more about marine engineering. For those who wish to take it up as a sea-going career, they need to meet the requirements of the MPA before going for their oral examinations.

Course Duration: 1 year
Course Intake: This is a web-based self-learning course. You can study anytime and anywhere in the world as long as you can access the internet through a computer.
Course Fees: $1,500 + 7% GST

22-WEEK GRADUATE MECHANICAL ENGINEER (GME) PROGRAMME

(A Conversion Course for Graduates)

The aim of this course is to train engineers with degrees in Mechanical Engineering from recognised universities in accordance with the Reg. III/1 of STCW 1995 Convention. MPA will issue CoC Class 5 Marine Engineer Officer on successful completion of this course and subsequent completion of the required sea service and oral examination. This conversion course creates an opportunity for Mechanical Engineering graduates to make a transition toward successful careers as Marine Engineers in the shipping industry.

Course Duration: 22 weeks
Course Intake: (subject to a minimum class size of 14 students)
Course Fees: S$6,400 + 7% GST
+ Course fees subject to change

PROGRAMME CONTENT

- Bench Fitting, Machining and Welding
- General Ship Knowledge
- Diesel Propulsion Plant
- Engine Auxiliary System
- Auxiliary Boiler
- Auxiliary Machinery
- Mandatory Short Courses in accordance with STCW
- Convention at Operation Level
  Entry Requirements
- Degree in Mechanical Engineering from recognised universities
- Eligibility letter from the MPA, Singapore

Note:
All GME students MUST enrol for the CoC 5 E-Learning course for the online learning. This web-based CoC 5 E-Learning is a recognised learning programme by MPA and all candidates MUST complete the programme and attend a written assessment prior to their MPA CoC Class 5 Oral Examinations.

SHORT COURSES

SMA also regularly conducts a wide range of 'mandatory' and other short courses for the maritime industry. The contents of these courses, where required, meet the STCW2010 requirements and the completion of some of these courses is a pre-requisite for issue of CoC. General information on some of the important short courses is provided below. However, for more details on entry requirements, course schedules and other updated information, please log on to www.sma.sp.edu.sg, or contact our short courses staff at +65 67721817 during working hours (Mon – Fri).

1. MEDICAL FIRST AID ON-BOARD SHIP (STCWVI/4 PARA 1)

This course aims at providing ship officers with a basic knowledge of the principles and practice of first aid. Participants will learn resuscitation and CPR techniques, the treatment of common injuries that could occur on-board ships and the treatment of common ailments. In addition, they will be taught procedures to be followed in the transportation and handling of patients and in seeking radio medical advice. The possession of a valid Medical First Aid Certificate is mandatory for the issue of all classes of Engineering CoC and Class 3 (Deck) CoC.

2. MEDICAL CARE ON-BOARD SHIP (STCWVI/4 PARA 2)

This course aims to provide every seafarer, who is designated to be in charge of medical care on board ship, to apply first aid in the event of an accident or illness on board and to be able to provide medical care to the sick and the injured while they remain on-board and be able to participate in co-coordinated schemes for medical assistance to ships. The possession of a valid Medical Care Certificate is mandatory for the issue of CoC Class 1 & 2 Deck Officer. Applicants for the Medical Care Onboard Ship Course must hold a Class 3 (Deck) or Class 5 (Deck) CoC and a valid recognised Prof. in Medical First Aid Certificate (or equivalent).

3. NAVIGATION CONTROL COURSE (STCWII/2 PARA 2.2)

The course is essentially practical and consists of a series of exercises performed on a Navigation Simulator. It aims at providing training for the maintenance of safe navigation through the use of radar and ARPA and modern navigation systems to assist command decision-making. At the end of the training, participants shall be able to plan, organise and manage a bridge team and, show proficiency in the use of marine radar and ARPA for navigation and collision avoidance, and for the coordination and execution of a 'search and rescue operation'. The possession of a Navigation Control Course (NCC) Certificate is mandatory for the issue of CoC Class 1 (Deck) or CoC Class 2 (Deck). All applicants for this course must possess a Radar Observer Certificate, or ENS Certificate or have a valid Harbour Pilot's licence (recognised by the MPA).

4. BASIC TANKER TRAINING COURSE (STCWV/1-1 AND V/1-2)

The course is designed to meet the training requirements of paragraph 1.2 of Reg.V/1 of STCW, which is applicable to people who are likely to be assigned specific duties and responsibilities related to cargo or cargo equipment on-board any tanker (but not with immediate responsibility). The course introduces to participants the possible dangers to human life and the environment from accidents involving tankers carrying petroleum, liquid chemicals or liquefied gas cargoes in bulk. The course also familiarises participants with the cargo handling equipment, systems and procedures on board different types of tankers, the characteristics and hazards of their cargoes, basic safety and emergency procedures, and pollution prevention. Participants for this course are expected to be above 16 years of age, have basic working knowledge of English and merchant ship terminology.

5. ADVANCED TRAINING FOR TANKER CARGO OPERATIONS STCW REG V/1-1 (PARA 4.3,6.3), REG V/1-2 (PARA 4.3)

Each of these three courses is designed to meet the shore-based training requirements of paragraph 2 of Reg. V/1-1 of STCW – appropriate to the type of tanker. The course provides specialised training at an advanced level for seafarers likely to be assigned duties as Master, Chief Engineer Officer, Chief Officer, Second Engineer Officer, or for people with immediate responsibility for cargo operations on board the type of tanker that they are likely to serve.

a. Advanced Oil Tanker Course

The course content covers oil tanker safety regulations and codes of practice, design and equipment of oil tankers, cargo characteristics, oil tanker operations, safety measures during repairs or maintenance, emergency operations and pollution control.

b. Advanced Chemical Tanker Course

The course content covers chemical tanker safety regulations and codes of practice, design and equipment of chemical tankers, cargo characteristics, chemical tanker operations, safety measures during repairs or maintenance, emergency operations and pollution control.

c. Advanced Liquefied Gas Tanker Course

The course content covers liquefied gas tanker safety regulations and codes of practice, practical gas tanker firefighting, chemistry and physics related to gas cargoes, health hazards, cargo containment, cargo handling systems, ship operating procedures, safety practices and equipment, emergency procedures and general principles of cargo operations. (Note: Participants must be medically fit to undertake strenuous gas fire-fighting training.)

ENTRY REQUIREMENT FOR THESE COURSES

The completion of an approved Tanker Familiarisation Course (at least covering the training requirements of STCW Reg. V/1-2, PARA 2); OR have at least three months sea-service on-board any tanker.

The possession of an Advanced Tanker Safety Course Certificate is one of the requirements towards the issue of an appropriate Dangerous Cargo Endorsement(s) under the Merchant Shipping (Deck Officers) and (Marine Engineer Officers) Regulations.

COURSE MODULES

COURSE	DURATION	FEES
Emergency Occupational Safety & Survival Functions Training Course	1.5 days	$680 + GST
Navigation Control Course, STCW 2010 II/2 PARA 2.2	5 days	S$960 + GST
Basic Tanker Training (Oil, Chemical & Liquified Gas Tankers) STCW V/1-1, 1-2	9.5 days	S$900 + GST
Advanced Oil Tanker Course STCW 2010 V/1-1, PARA 4.37.	7.5 days	S$1,700 + GST
Advanced Chemical Tanker Course STCW 2010 V/1-1, PARA 6.3	7.5 days	S$1,800 + GST
Advanced Liquefied Gas Tanker Course STCW 2010 V/1-2,PARA 4.3	8 days	S$1,700 + GST
Basic Occupational Safety & Security Training Courses, STCW 2010 Reg VI/1, VI/6	8 days	S$1,350 + GST
Global Maritime Distress Safety System – General Operator's Certificate Course & Exam – STCW Reg IV/2 PARA 2.2	2 weeks	S$2,100 + GST
Global Maritime Distress Safety System – Restricted Operator' Course STCW Reg IV/2, PARA 2.2	5 days	S$920 + GST
Proficiency in Survival Craft & Rescue Boat – other than a Fast Rescue Boat, STCW 2010 VI/2 PARA 1.3	4 days	S$690 + GST
Proficiency in Fast Rescue Boat Section STCW 2010 A-VI/2 IMO Model Course 1.24	3 days	S$950 + GST
Safety Familiarisation Training STCW 2010 VI/1 PARA 1	1 day	S$180 + GST
Advanced Fire Fighting Course, STCW 2010 VI/3 PARA 1	5 days	S$700 + GST
Shipboard Training & Assessment Course, STCW 2010 I/6 PARA 1.2	Either 5 days full-time or via Distance Learning	S$300 + GST
Crowd Management & Safety Training for Passenger Ships – other than Ro-Ro Passenger Ships, STCW 2010 V/3 PARA 4 & 7	1 day	S$250 + GST
Crisis Management, Human Behaviour & Safety for Passenger Ships – other than Ro-Ro Passenger Ships, STCW 2010 V/3 PARA 6 & 7	1 ½ days	S$350 + GST
Electronic Navigation Systems Course, STCW 2010 II/1 PARA 5	13 evenings plus 2 full Saturdays	S$1,700 + GST
Refresher course for the GMDSS General Operator's Certificate (GOC)	3 days	S$970 + GST
Operational use of Electronic Chart Display and Information Systems (ECDIS), (STCW Code Section A-II/1 Para 2 & Section B-II/1 Para 12.1)	5 days	S$1,100 + GST
Ship Security Officer (SSO) STCW 2010 VI/5 PARA 1.2	2 days	S$500 + GST
Designated Security Duty Course STCW 2010 VI/6 PARA 4	1 day	S$200 + GST
Medical First Aid On-board Ship, STCW 2010 VI/4 PARA 1	4 days	S$280 + GST
Medical Care On-board Ship, STCW 2010 II/2 PARA 2	5 days	S$350 + GST
High Voltage Installations Operational Course	1 days	S$900 + GST
High Voltage Installations Management Course	3 days	S$2,000 + GST
Bridge and Engine Room Resource Management (Management and Leadership)	4 days	S$1400 + GST
Bridge and Engine Room Resource Management (Operation)	3 days	S$680 + GST

6. GMDSS GLOBAL MARITIME DISTRESS & SAFETY SYSTEM GENERAL OPERATOR'S CERTIFICATE OF COMPETENCY (GOC) (STCWA-IV/2 PARA 2.2)

This course provides students with knowledge and skills in Global Maritime Distress and Safety System, IMO Model Course 1.25 and the ability to operate a maritime mobile communication station. The proper use of communication equipment is emphasised via hands-on simulation. Contents include international radio regulations, SOLAS regulation, radio telephony theory and practical, satellite communication, search and rescue communications and procedures. Satisfactory completion leads to a GMDSS General Operator's Certificate of Competency (for all sea areas) issued by the Infocomm and Media Development Authority of Singapore (IMDA). Candidates for this course must be at least 18 years of age, have basic computer skills, a good working knowledge of English, have no serious impediment of speech, hearing or sight, have normal colour vision and preferably possess 6 months of sea service.

7. GMDSS GLOBAL MARITIME DISTRESS & SAFETY SYSTEM RESTRICTED OPERATOR'S CERTIFICATE OF COMPETENCY (ROC) (STCWA-IV/2 PARA 2.2)

This course provides students with knowledge and skills in Global Maritime Distress and Safety System, IMO Model Course 1.26 and the ability to operate a maritime mobile communication station on board. Satisfactory completion leads to a GMDSS Restricted Operator's Certificate of Competency (for Sea Area 1 only – mainly VHF) issued by the Infocomm and Media Development Authority of Singapore (IMDA). Candidates must be at least 18 years of age, have basic computer skills, a good working knowledge of English, have no serious impediment of speech, hearing or sight, have normal colour vision and preferably have 6 months of sea service.

8. PROFICIENCY IN SURVIVAL CRAFT & RESCUE BOAT (OTHER THAN FAST RESCUE BOAT) (STCW-VI/2 PARA 1.3)

This course provides training to ensure that participants are able to launch and take charge of a survival craft or rescue boat (other than a fast rescue boat), operate the survival craft engine, manage survivors and use locating devices. The certificate, issued by MPA, is mandatory for the issue of Certificates of Competency Class 3 (Deck) and for the issue of any Class of Marine Engineering Certificate of Competency. Candidates must be at least 18 years of age, have basic working knowledge of English, have at least 6 months service on any ship, a basic knowledge of ship terminology and be physically and medically fit for strenuous training activity, including entry into water from a height.

9. PROFICIENCY IN SURVIVAL CRAFT & RESCUE BOAT (OTHER THAN FAST RESCUE BOAT) - BRIDGING COURSE

This course is intended for seafarers who have passed the Proficiency in Survival Craft course under STCW78 rules (or Lifeboatman's under earlier rules) and need to upgrade to STCW requirements by attending this special short course. Particular emphasis will be placed on proficiency of rescue boats (other than fast rescue boats). Candidates may be screened for suitability prior to entry.

10. SAFETY FAMILIARISATION TRAINING (STCW VI/1 PARA 1)

This course familiarises participants in the preliminary essentials of safety and personal survival in relation to fire and other emergencies on board ships, according to the stipulated STCW requirements. Participants must be at least 16 years of age and have basic working of English.

11. BASIC OCCUPATIONAL SAFETY & SECURITY TRAINING (STWC REG VI/1, VI/6)

This training consists of four modules (Personal Safety & Social Responsibility; Fire Prevention & Fire Fighting; Elementary First Aid; and Personal Survival Techniques), which may be taken separately. It aims to train participants in the basic concepts, principles and techniques of personal survival, fire prevention, fire fighting, elementary first aid, personal safety and social responsibilities on board merchant ships, according to the stipulated requirements. This training is intended for most new entrants to the merchant navy, and participants must be at least 16 years of age, physical and medically fit for strenuous activity and have basic working knowledge of English.

12. ADVANCED FIRE FIGHTING AT SEA STCW VI/3, PARA 1

A trainee successfully completing this course will, in the event of a fire on-board a ship, be able to take command, organise the personnel effectively and control the fire fighting operations using those techniques in which he has been trained. He will have also acquired knowledge of fire prevention and an ability to inspect and maintain the fire extinguishing systems and equipment. Participants must possess a valid 'Fire Prevention & Fire Fighting Course' certificate or equivalent (under STCW Reg.VI/1), be physically and medically fit and have good working knowledge of English. This course is required for all Classes of Deck and Marine Engineering Certificates of Competency.

13. ADVANCED FIRE FIGHTING AT SEA-BRIDGING COURSE

This course is intended for Singapore Certificate of Competency (CoC) or Certificate of Service (CoS) holders who have completed a Basic Fire Fighting Course conducted by PSA/NMA and need to upgrade to the Advanced Fire Fighting course under STCW requirements. Participants must not be less than 18 years of age and be physically and medically fit and have good working knowledge of English.

14. SHIPBOARD TRAINING & ASSESSMENT (STCW I/6 PARA 1.2)

The course provides knowledge for conducting training and assessment on-board ships. At the end of the course, participants should be able to explain and demonstrate the concepts and techniques of shipboard training and assessment and to apply them effectively on board ship. Participants should be holders of Class 1, 2, 4 & 5 Deck, or Local Trade Master, or Class 1, 2 & 5 MEO Certificates of Competency.

15. CLASS 2/1 MARINE ENGINEER OFFICER REVALIDATION (STCW I/11 PARA 1.2)

The course is intended for those holding Singapore Class 2 or Class 1 Marine Engineer Officer certificates of competency, or certificates of service, issued prior to 1 April 1998 and require undergoing this training to update their knowledge to meet the requirements of Section A-III/2 of the STCW Code. The course shall, amongst others, include changes to national and international regulations concerning the safety of life at sea and the protection of the marine environment.

16. CROWD MANAGEMENT & SAFETY TRAINING FOR PASSENGER SHIPS — OTHER THAN RO-RO PASSENGER SHIPS (STCW V/2 PARA 4 & 7)

The course is intended for all personnel on passenger ships, other than Ro-Ro passenger ships, who are required to provide direct services to passengers or designated to assist passengers in emergency situations. Candidates for this course should have completed basic safety training under STCW VI/1 or safety familiarisation training under STCW V/3.

17. CRISIS MANAGEMENT, HUMAN BEHAVIOUR & SAFETY FOR PASSENGER SHIPS — OTHER THAN RO-RO PASSENGER SHIPS (STCW V/2 PARA 6 & 7)

The course is intended for those likely to become Masters or senior officers on passenger ships, other than Ro-Ro passenger ships. Candidates for this course should hold a Deck or Marine Engineer Officer certificate of competency of any class.

18. OPERATIONAL USE OF ELECTRONIC CHART DISPLAY AND INFORMATION SYSTEMS (ECDIS), (STCW CODE SECTION A-II/1 PARA 2 & SECTION B-II/1 PARA 12.1)

This course is intended to provide thorough training in the basic theory and proper use of Electronic Chart Display and Information Systems (ECDIS) for those who will be in charge of a navigational watch, on vessels equipped with ECDIS, in order to enhance navigational safety. The training will include (amongst others) the safe operation of ECDIS equipment; a thorough knowledge of the Electronic Navigational Chart (ENC) and its use with navigation sensors; the interpretation and proper use of ECDIS related information, and the knowledge of the capability and limitations of ECDIS as an aid to navigation. The syllabus for this course exceeds the requirements of IMO model Course No.1.27 (2012) and training is conducted on SMA's newly equipped 10-bridge-station ECDIS Simulator. The ECDIS simulator provides training at a management and operational levels and is fully compliant with the Standards of Training, Certification and Watchkeeping (STCW) 2010 requirements. Candidates for this course should be at least 18 years of age and they must hold a Certificate of Competency as a Navigating Officer, OR be Deck Cadets who have satisfactorily completed an approved Electronic Navigations Systems Course (ENS), and, preferably have participated in supervised Bridge Watchkeeping duties for at least 6 months, and have adequate working knowledge of English (spoken and written).

19. GMDSS GENERAL OPERATOR'S CERTIFICATE (REFRESHER)

This course provides students with knowledge, application and operation of GMDSS equipment and able to take primary responsibility for radio communications on board ships during distress incidents. The proper use of communication equipment is emphasised via hands-on simulation. Candidates for this course must be a holder of GMDSS General Operator's Certificate issued by the Infocomm and Media Development Authority of Singapore (IMDA) that do not meet the sea time requirements (at least 12 months in total of sea going service from the issue date of existing GOC) for revalidation of their certificate.

20. ELECTRONIC NAVIGATION SYSTEMS (STCW II/1 PARA 5)

The course aims at providing those who are likely to become officers in charge of a navigational watch, with training for the maintenance of a safe navigational watch through the use of radar, ARPA and use of electronic systems of position fixing and navigational systems including the use of echo-sounders, and compasses. The electronic navigation aids simulators will be extensively used to allow the officers to develop essential skills in handling radar, ARPA and other navigational aids. Entry to the course is open to candidates at least 18 years of age, possessing at least 12 months deck sea service, and having a good working knowledge of English.

21. ELECTRONIC NAVIGATION SYSTEMS — BRIDGING COURSE

Intended for seafarers with at least 12 months deck sea service (including 6 months on the Bridge), who have completed a Radar Observers or Radar Interpretation course approved under the previous rules. A full Electronic Navigation Systems Certificate would be issued to those who, after meeting the entry requirements, satisfactorily complete this course. Candidates should have a good working knowledge of English. The resources in the academy have been designed and developed to provide a broad-based, practice-oriented learning environment and are equipped with the latest technology. They are established to complement and reinforce academic studies with focus on practice and application.

22. MARITIME CREW RESOURCE MANAGEMENT COURSE

This training programme deals with management in highly operational situations, for example on-board ship's bridges, in engine rooms, in control rooms of power plants, in aircraft cockpits, and even in medical operating theatres. It is a fact that the way human beings interact, communicate and make decisions in such situations is very similar. So, management errors are also similar. The base for this course was developed in the airline industry as a result of research that showed that most aircraft accidents are caused not by technical errors, but by crew management errors.

23. Dynamic Position (DP) Induction course (Offshore Scheme)

The DP Induction (Basic) Course is accredited by the Nautical Institute. It is the first step towards certification of Dynamic Position Operator. The course is a full 4-day training on our latest Dynamic Positioning simulator. The DP simulator has been set up to train DP Operators up to DP 2 class vessel.

Upon successful completion of the course, participants will have a basic understanding and basic DP handling of the equipment for a DP vessel. This course is suitable for participants with marine background and wants to serve in the offshore industry. The participants are required to sit for an online examination set by Nautical Institute on the final day of the course. Upon passing the examination and completion of the course, the participants will be issued a Nautical Institute Log Book, where they are required to complete the tasks set by Nautical Institute in their log book before they are allowed to attend the Dynamic Positioning Simulator Course. The participants are also required to record their DP sea time in the log book. The participants are required to clock 60 days of DP sea time before attending the Simulator course.

24. DP Simulator (Advance) Course

The DP Simulator (Advance) Course is accredited by the Nautical Institute and is a full 4-day course. As part of the course requirements, the participants are required to complete the tasks assigned in their logbooks and clock a minimum of 60 days of DP sea time before attending this course. The course exposes the participants to various different routine and emergency operations onboard a DP vessel. On the final day of the course, the participants are required to perform a DP Set-up Assessment and also required to sit for an online examination set by the Nautical Institute. After passing the online examination and assessment of the course, the participants are required to complete another 60 days of DP sea time before they may apply for their DP license with the Nautical Institute.

25. THE SHIP SECURITY OFFICER COURSE STCW VI/ 5 PARA 1.2

The course aims to provide knowledge to those who may be designated to perform the duties and responsibilities of a Ship Security Officer (SSO), as defined in section A/2.1.6 (and section A/12) of the ISPS Code and section A-VI/ 5 of the STCW Code as amended, and in particular the duties and responsibilities with respect to a security of a ship, for implementing and maintaining a Ship Security Plan and for liaising with the Company Security Officer (CSO) and the Port Facility Security Officer (PFSO).

26. SECURITY AWARENESS TRAINING FOR SEAFARERS WITH DESIGNATED SECURITY DUTIES STCW VI/6/ PARA 4

This course is intended to provide the knowledge required to enable personnel to do their designated security duties as required by the vessels Ship Security Plan (SSP). This would be to enhance ship security in accordance with the requirements of Chapter XI-2 of SOLAS 74 as amended, the ISPS Code, and section A-VI/ 6-2 of the STCW Code as amended.

LABORATORIES/ WORKSHOPS

The **Fabrication & Engineering Skills Workshop** is equipped with a wide range of hand tools. Machine tools including the laser alignment machine as well as equipment employing joining technologies such as gas, electric arc welding, TIG and WIG. It serves to equip our engineering graduates with fabrication and engineering skills for the industry through the process of producing workpieces and working on projects:

- Using the wide range of machine tools
- Using the gas and electric arc welding systems
- Bench fitting using a range of hand tools
- Conducting alignment testing

The **Electrical Laboratory** is equipped with modular workstations. It also houses an operational marine switchboard served by two generator sets. They support the learning of the following:

- Characteristics and principles of operation of electrical machines
- Power generation and distribution on board ship
- Reading of electrical diagrams
- Operation of different types of motor starter
- Electrical measurements
- Electrical fitting skill
- Electrical fault diagnosis
- Characteristics of analogue electronic components

The **Thermo Mechanics Laboratory** is designed to enhance the classroom learning experience and is composed of three laboratories:

Energy Management Laboratory

- Aids the learning of the fundamentals of fluid mechanics in pumps and pumping systems
- Aids the learning of the thermodynamic performance of piston compressors, heat engines, refrigerating and air-conditioning plants

Mechanics Laboratory

- Analysis of static and dynamic mechanical system using simple mechanisms and simulated machines
- Analysis of material strength and characteristics under tension, bending and torsional conditions

Fuel & Lube-Oil Laboratory

- Analysis of physical behaviour and chemical characteristics of typical marine fuels and lube oils

The **Workplace Safety & Health (WSH) Laboratory** provides an environment for the study of the fundamentals in shipboard safety particularly in the areas of fire fighting and personal safety. Realistic installations and equipment of the latest design are in use. It is developed to support courses in:

- Basic fire fighting (principles and practice)
- Advanced fire fighting (strategy and tactics)
- Shipboard safety management
- Air Sampling & Analysis
- Hazardous Materials Incident Response
- Industrial Hygiene & Industrial safety
- Occupational Ergonomics

The **Control Engineering Laboratory** is equipped with industrial instrumentation and control systems to reinforce classroom lessons in the following areas:

- Process Measurement Technology
- Automatic Feedback Control Systems
- Pneumatic and Electronic Logic Circuits
- Programmable controllers
- Boiler Process Control Systems
- Basic Digital Electronics

The **Boiler House** provides a learning environment similar to that found in steam generation plants. It is equipped with two operational boilers and other steam teaching aids to support the following learning objectives:

- Operations of shipboard auxiliary boilers
- Familiarisation of various boiler mountings
- Familiarisation of modern boiler controls
- Practices for safe and economic operations of steam systems

The **Integrated Simulation Centre (ISC)** was jointly set up by the MPA and SMA to further enhance the quality and efficiency of maritime training conducted in Singapore using simulators. It is the official venue for MPA examinations on topics related to maritime simulations. ISC simulators offer different realistic scenarios for training of ship officers and crew in a risk-free environment. Students will experience first-hand state-of-the-art technology employed for seafarers' trainings and shipping operations via sessions on the Navigation Bridges and the Engine Room Simulators. Other advanced facilities such as the **Dynamic Positioning Offshore Handling Laboratory** and the Liquid Cargo Handling Simulators which are housed within the ISC also add to the range of maritime training capabilities it offers. Although developed primarily for the training of shipboard personnel, the ISC is also capable of conducting marine research and development for port planning.

In the **Full Mission Engine Room Simulator**, the comprehensive, realistic, interactive and dynamic systems simulate real-world ship propulsion plants. It is housed in a purpose built complex to support the following learning objectives:

- Exposure to the latest techniques in data acquisition, presentation and control
- Interactive experience with fully integrated and dynamic systems
- Familiarisation with operational routines and procedures
- Team work
- Process analysis and condition and performance monitoring
- Failure management and loss prevention
- Man-machine interfacing

The **Full-Mission Ship-handling Simulator** consists of five Navigating Bridges, three Instructor Stations and Briefing/Debriefing Room. The bridges have a horizontal field of view (HFOV) 240 and are fully equipped with the latest navigational equipment. All the bridges are fully equipped with state-of-the-art Computer Generated Image (CGI) system to create a highly realistic environment using improved technology of 1080p 120hz LED displays.

In addition to facilitating R&D in the field of navigation, the simulator also facilitates the following areas of training:

- Bridge Watchkeeping Principles & Procedures
- Electronic Navigation System integrations and operations
- Safe and efficient operations principles of RADAR and ARPA
- Safe and efficient navigation using ECDIS
- Bridge Team Work & Management
- Bridge Resource Management
- Basic & Advance Shiphandling
- Ship to Ship transfer and approach
- Shipboard Emergencies & Crisis Management
- Anti Piracy Navigation
- Ice Navigation

The **Maritime I.T. Laboratory** is equipped with the latest ship management software programmes. Also, students can access the online Portnet and Tradenet Systems.

The **Liquid Cargo Handling Simulator (LCHS)** models the cargo and ballast handling system/s of existing and modern tankers, their relevant auxiliaries, and the terminal facilities and processes required for tanker safety operations.

The LCHS has the overall ability and capacity to provide simulation, through the use of computer software models, covering all the processes in relation to existing and modern liquid cargo-handling system, cargo vapour recovery system and ballast handling systems, and other related auxiliary systems, for the types of ships and tanker terminals stated below:

a) Multi-grade VLCC
b) Multi-grade Petroleum Product Tanker
c) Multi-grade Chemical Tanker
d) LNG Tanker (Membrane Type & Moss Tank)
e) LPG Tanker

The simulator can provide the trainee with all the relevant critical cues and will enhance their awareness of the need for proper and safe procedures at all times when carrying out the various operations on-board tanker. These simulations of real-tanker models will enhance their ability to make decisions when experiencing operational problems and solving them, thus promoting safety and protecting the environment.

The **e-Navigation Simulator** is designed in full compliance with the latest International Maritime Organization (IMO) regulations. The simulation system is able to train students in the use of all shipboard electronic navigation and communication equipment, which includes ECDIS, Navigation Aids and the Global Maritime Distress and Safety System (GMDSS). The e-Navigation Simulator facilitates the following areas of training:

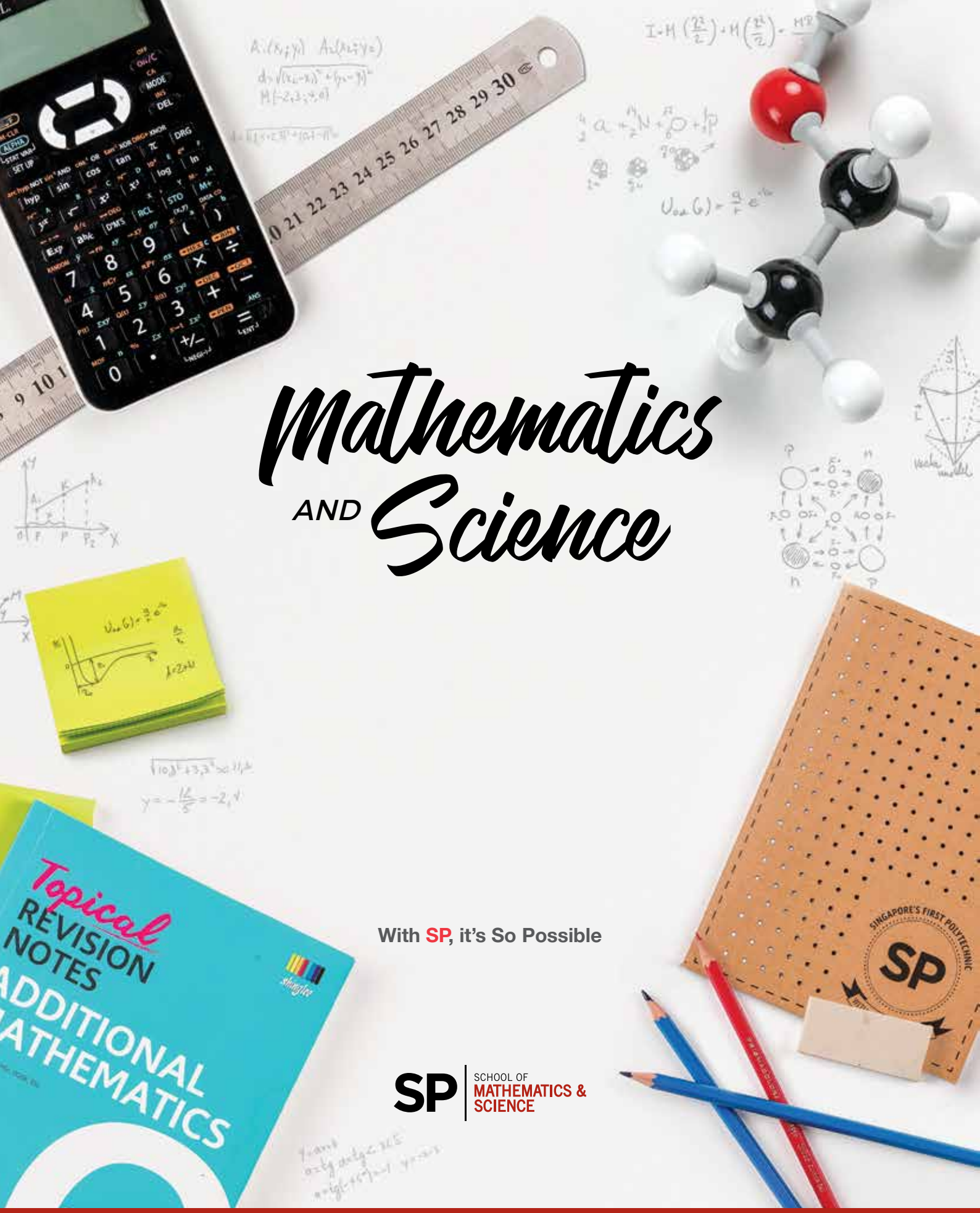
- Basic bridge work for cadets
- ECDIS
- GMDSS GOC
- GMDSS ROC
- Use of Radar, ARPA and other navigational aids ENS

The **Dynamic Positioning Offshore Handling Laboratory** conducts training for DP Operator serving on-board DP fitted vessels primarily engaged in the Off Shore Oil and Gas Industry. It is accredited to the Nautical Institute, London, as an approved Training Centre. The laboratory is equipped with 4 bridges of Class B Simulator. Each bridge is configured to the Offshore DP vessel of Class 2 of Navis DP System and equipped with 7 visual channels and touch screen monitors. Training can be conducted using 8 DP ship models.

The **Ship Planning Laboratory (SPL)** is a 24-station ECDIS and Passage Manager. The SPL prepares students for the transition from navigation using paper chart to using ECDIS to maintain the safety of navigation. Students will acquire the proficiency in operating, interpreting and analysing the information obtained from ECDIS. They would also experience the capability and limitations of ECDIS operations.

The **Poly Marina** on the West Coast waterfront is equipped with fully enclosed and partially enclosed lifeboats capable of being launched from a gravity davit as well as life rafts, which are necessary for training in basic safety, practical seamanship, proficiency in survival craft and other related maritime courses. Poly Marina is also the main national centre in Singapore for the conduct of Powered Pleasure Craft Driving Licence practical handling assessment. It houses powerboats, dinghies, kayaks and a 42-foot Grand Banks which makes Singapore Polytechnic the only education institution that is able to offer both maritime training as well as promote leisure sea sports activities to its students. In collaboration with a leading training centre, Poly Marina is also equipped with specialised training facilities to provide safety training courses for the offshore industry.

The **Maritime Business Centre** is a learning space that will provide the opportunity for students to strengthen their analytical skills, think critically on the scenario-based (case study) approach, develop them with strong knowledge of the maritime industry and equip them with IT and problem-solving skills. This learning space, flavoured with maritime culture, will create a lively environment for the students and by the students, lecturers or mentors including shipping professionals and maritime companies. It will depict the offices of real shipping companies for action, experiential and active learning through role plays of shipping scenarios (case study).



Mathematics AND Science

With SP, it's So Possible

SP | SCHOOL OF MATHEMATICS & SCIENCE

School of Mathematics & Science aims to build a strong foundation in mathematics and science in our students to enable them to master their core disciplines so as to meet the needs of industry and university. The school offers both core and advanced modules in Mathematics, Computing, and Physics to students in Engineering, Technology, and Business courses. It also offers the Specialist Diploma in Data Science to meet the needs of the industry.

POLYTECHNIC FOUNDATION PROGRAMME

The one-year Polytechnic Foundation Programme (PFP) offered by SP is broad-based and multi-disciplinary with the aim of providing students with a strong foundation in English language, Mathematics and Science. The programme offers a practical oriented curriculum to prepare polytechnic-bound Normal (Academic) students well for the course of their choice in SP.

The SP PFP will be conducted through small-group teaching to ensure that students receive ample support in their academic studies. Active and authentic learning will be incorporated throughout the programme to promote students' engagement in the learning process. Through multi-disciplinary project work, students will also be exposed to basic Design Thinking skills that will enable them to conceive innovative solutions that meet the needs of users.

Besides the structured curriculum, students will also be participating in out-of-classroom activities such as industry visits and field trips to allow them to connect to their course of study.

SP offers a number of diploma courses under the PFP. Courses are categorised as Science and Technology based or non-Science and Technology based. Entry requirements as well as the diploma courses offered can be accessed through the PFP website at **http://www.sp.edu.sg/pfp**.

COURSE MODULES

(FOR SCIENCE AND TECHNOLOGY COURSES)

MODULE CODE	MODULE	HOURS
Semester 1		
CP901Y	Application Science	37.5
LC701Y	Foundation Language and Communication Skills	75
LC702Y	Culture, Aesthetics and Society	30
LC703Y	Active and Effective Citizenry	45
MS960Y	Foundation Mathematics	90
MS980Y	Physics	37.5
MS9700	Fundamentals of Information Technology	60
Semester 2		
CP901Z	Application Science	37.5
ET0181	Fundamentals of Innovation Development	60
LC701Z	Foundation Language and Communication Skills	75
LC702Z	Culture, Aesthetics and Society	30
LC703Z	Active and Effective Citizenry	45
MS960Z	Foundation Mathematics	90
MS980Z	Physics	37.5

COURSE MODULES

(FOR NON-SCIENCE AND TECHNOLOGY COURSES)

MODULE CODE	MODULE	HOURS
Semester 1		
BA901Y	Fundamentals of Enterprise Development	75
LC701Y	Foundation Language and Communication Skills	75
LC702Y	Culture, Aesthetics and Society	30
LC703Y	Active and Effective Citizenry	45
MS960Y	Foundation Mathematics	90
MS9700	Fundamentals of Information Technology	60
Semester 2		
BA901Z	Fundamentals of Enterprise Development	75
LC701Z	Foundation Language and Communication Skills	75
LC702Z	Culture, Aesthetics and Society	30
LC703Z	Active and Effective Citizenry	45
MS960Z	Foundation Mathematics	90
MS9810	Science for Everyday Living	60

** All full-time diploma students are required to take two compulsory Education and Career Guidance Modules in SP. Students will take SP101A: Education and Career Guidance 1 – Personal Development (15 hours) in their first year. In their second or third year, students will take SP201A: Education and Career Guidance 2 – Career Development (30 hours).*

** Students are required to take one Sports for Life (SFL) module during PFP in SP. Students will go through Strength and Conditioning programme in semester one and Games Series programme in semester two.*

BRIDGING PROGRAMMES

BRIDGING MATHEMATICS FOR ITE UPGRADERS

ITE upgraders who enrol into SP's Engineering courses will undertake a structured Bridging Mathematics programme. Students in this programme will take additional mathematics modules to help them bridge the gaps and strengthen their mathematics foundation. This will enable them to better cope with the demands of the core Mathematics modules in their respective Engineering course.

The Bridging Mathematics programme for each category of ITE upgraders comprises two modules. Students who have read an elective mathematics module in ITE may be exempted from the first module of the respective category.

ONLY FOR ITE STUDENTS JOINING SP FROM YEAR 1

MODULE CODE	MODULE	HOURS
MS010Q	Bridging Mathematics	30
MS011Q	Bridging Mathematics I	30

ONLY FOR YEAR 2 DIRECT ENTRY STUDENTS FROM ITE

MODULE CODE	MODULE	HOURS
MS020Q	Bridging Mathematics II (A)	30
MS021Q	Bridging Mathematics II (B)	30

ADVANCED PROGRAMMES

ADVANCED PROGRAMMES IN MATHEMATICS AND PHYSICS FOR ENGINEERING AND INFO-TECHNOLOGY STUDENTS

The Advanced Mathematics modules are aimed at preparing students for further studies. The training will help students build a solid foundation in mathematics and develop analytical, logical thinking and problem solving skills. Students who complete all three modules may receive module exemptions from local universities when they pursue their university studies.

For students from:

School of Architecture & the Built Environment (only certain Diplomas)

School of Chemical & Life Sciences (only certain Diplomas)

School of Electrical & Electronic Engineering (All Diplomas)

School of Mechanical & Aeronautical Engineering (All Diplomas)

Singapore Maritime Academy (only Diploma in Marine Engineering)

School of Digital Media and Infocomm Technology(*)

(*) Students from School of Digital Media and Infocomm Technology may be required to read a qualifying module, MS100Q, before reading the Advanced Mathematics modules.

MODULE CODE	MODULE	HOURS
MS801M*	Advanced Mathematics I	60
MS802M	Advanced Mathematics II	60
MS803M	Advanced Mathematics III	60

For students who are not able to take up the Advanced Mathematics modules indicated above, an advanced module in Further Mathematics is offered to them. Its purpose is to provide students with essential mathematical knowledge for further studies at university.

For students from:
School of Electrical & Electronic Engineering (All Diplomas)
School of Mechanical & Aeronautical Engineering (All Diplomas)
School of Business (All Diplomas)
School of Digital Media and Infocomm Technology (All Diplomas)
School of Architecture and the Built Environment (Only certain Diplomas)

MODULE CODE	MODULE	HOURS
MS837M	Further Mathematics	60

In addition, an advanced module in Physics is also offered to strengthen the physics foundation of students and prepare them for further studies.

For students from:
School of Electrical & Electronic Engineering (All Diplomas)
School of Mechanical & Aeronautical Engineering (All Diplomas)
School of Digital Media and Infocomm Technology (All Diplomas)

MODULE CODE	MODULE	HOURS
MS864M	Physics	60

ADVANCED PROGRAMMES IN MATHEMATICS AND PHYSICS FOR INFO-TECHNOLOGY*

The Higher Mathematics modules are aimed at strengthening the students' foundation in mathematics to prepare them for further studies. The training will help them develop analytical, logical thinking and problem-solving skills.

For students from:
School of Digital Media & Infocomm Technology (only certain Diplomas)

MODULE CODE	MODULE	HOURS
MS861M**	Higher Mathematics I	60
MS862M	Higher Mathematics II	60
MS863M	Higher Mathematics III	60

Students who are not able to take up the Higher Mathematics Modules indicated above, may read the advanced module in Further Mathematics, MS837M. This module prepares students with the essential mathematical knowledge necessary for further studies at university.

(*) This program will be retired in AY1819.
MS863M will have its final run in AY1819S1.

For students from:
School of Digital Media & Infocomm Technology (All Diplomas)

MODULE CODE	MODULE	HOURS
MS837M	Further Mathematics	60

In addition, an advanced module in Physics is also offered to strengthen the physics foundation of students and prepare them for further studies.

For students from:
School of Digital Media & Infocomm Technology (only certain Diplomas)

MODULE CODE	MODULE	HOURS
MS864M	Physics	60

MATHEMATICS FOR BUSINESS STUDENTS

An advanced module in Mathematics is offered to Business students. This module is designed to provide foundational mathematical knowledge required in Business courses at the university.

For students from:
School of Business (only certain Diplomas)

MODULE CODE	MODULE	HOURS
MS837M	Further Mathematics	60

SPECIALIST DIPLOMA IN **DATA SCIENCE** (PART-TIME)

This is a one-year part-time course that provides training in the increasingly important areas of data science and analytics. The course is conducted in the evening.

ENTRY REQUIREMENTS

Applicants to this course must have, as a minimum requirement, a polytechnic diploma or higher qualification. Applicants are expected to be proficient in mathematics at the diploma level or its equivalent.

COURSE ASSESSMENT

Students must complete and pass the assessments of all the modules in the two post-diploma certificates in order to be awarded the specialist diploma.

COURSE STRUCTURE

Students are awarded the Specialist Diploma in Data Science after successfully completing two post-diploma certificates (PDCs) in one of the following possible progressions.

Specialist Diploma in Data Science (Data Analytics)

Semester 1 (PDC 1 Certificate in Fundamentals of Data Science)
Semester 2 (PDC 2 Certificate in Data Analytics)

Specialist Diploma in Data Science (Predictive Analytics)

Semester 1 (PDC 1 Certificate in Fundamentals of Data Science)
Semester 2 (PDC 3 Certificate in Predictive Analytics)

Each PDC is comprised of two modules that are taken together during one semester. The modules within each PDC are as follows.

PDC 1 Certificate in Fundamentals of Data Science

MODULE CODE	MODULE	HOURS
IT8701	Introduction to Programming for Data Science	60
MS9001	Introduction to Statistics for Data Science	60

PDC 2 Certificate in Data Analytics

MODULE CODE	MODULE	HOURS
MS9002	Data Mining Techniques	60
MS9003	Applied Statistical Methods	60

PDC 3 Certificate in Predictive Analytics

MODULE CODE	MODULE	HOURS
MS9004	Introduction to Statistical Modelling	60
MS9005	Generalised Modelling and Forecasting	60

The School of Digital Media and Infocomm Technology also offers the Specialist Diploma in Data Science (Artificial Intelligence) and the Specialist Diploma in Data Science (Big Data & Streaming Analytics). Please see page 149.

SHORT COURSES

The school also offers short courses in Mathematics and Physics. These short courses prepare polytechnic graduates for further studies in the universities.

PREPARATORY MATHEMATICS FOR UNIVERSITY

This is a refresher course in mathematics designed specifically for polytechnic graduates who plan to pursue a degree in engineering or IT.

PREPARATORY PHYSICS FOR UNIVERSITY

This course provides students with a good foundation in physics for further studies in universities. Topics covered include physical quantities and units, kinematics, dynamics, oscillations, waves, electricity, magnetism and electromagnetism. The extensive use of vectors and calculus in developing concepts allows the students to see how mathematics is used as a concise language of Physics.

TRAINING FACILITIES

COMPUTER LABORATORY

The computer laboratory provides students from various schools with practical training in computer programming and computer applications. Students will have opportunities to gain competence in a broad range of computing skills. The laboratory is also used for the teaching of mathematics.

The laboratory is designed to allow a better integration of IT into the mathematics curriculum. It is equipped with a networking system to create a dynamic and interactive teaching and learning environment for both lecturers and students. Students are allowed to explore mathematical and scientific concepts using the latest application software. This helps to inspire them to think creatively in this IT-enhanced environment.

Certification examinations like Microsoft Office Specialist (MOS) are conducted in the laboratories as well. In the evenings, short courses are often conducted in the laboratories for industrial and business personnel.

DEVELOPMENT LABORATORY

The development laboratory provides a space for staff to brainstorm, design, construct and develop experiments or activities related to teaching and research. The laboratory is equipped with a 3D-printer, Arduino kits and other tools to support research and development. It also consists of multiple wall partitions, movable tables and chairs to facilitate small group discussions. There are also display cabinets to showcase 3D models and projects.

LEARNING LABORATORIES

The learning laboratories support the teaching of Physics, Chemistry/Biology and Engineering and Technology Project modules of the Polytechnic Foundation Programme. Students will have opportunities to strengthen their understanding of scientific concepts and gain hands-on practical skills through experiments and projects conducted in the laboratories. The learning laboratory for Chemistry/Biology is managed by the School of Chemical & Life Sciences.

The design and layout of the learning laboratories encourage collaborative learning. Each laboratory is equipped with the necessary IT, video and audio systems to support the teaching and facilitation of the learning environment for the students.

MICROSOFT OFFICE SPECIALIST (MOS)

The School of Mathematics & Science is the authorised centre for the administration of Microsoft Office Specialist Examination in SP. It provides administrative support for students to acquire certifications in software application skills.

The mission of the Department of Educational Development (EDU) is to enhance the quality of teaching and learning in Singapore Polytechnic (SP) by providing expertise for the professional development of academic staff and assisting academic schools in developing forward-looking curriculum and strategies.

The key functions of EDU include encouraging and leading educational innovations and initiatives; providing consultancy in curriculum, teaching, learning and assessment; applying educational research to improve pedagogical practices; promoting the use of ICT; and providing multimedia production services for e-learning content creation.

EDUCATIONAL DEVELOPMENT

EDU pursues pedagogical innovations, translates new research findings into practical curriculum applications and leads educational initiatives, such as SP's Holistic Education, Conceive-Design-Implement-Operate (CDIO), Design Thinking, Learning Express, Intrinsic Motivation, Learning Experience Design and Pedagogy for the Professions.

HOLISTIC EDUCATION

EDU supports academic schools in their implementation of SP's Holistic Education. EDU works with the academic schools to redesign their syllabi, learning and assessment activities to better reflect SP's desired graduate attributes.

PEDAGOGY FOR THE PROFESSIONS

EDU helps to chart SP's pedagogical direction in preparing our students for work, life and the world through Pedagogy for the Professions. The four dominant teaching methods i.e. Project with CDIO elements, Case Method, Critiques and Simulated Practice are used by our courses to prepare our students with the knowledge, skills, values, attitudes and behaviours for them to grow and to innovate in their respective professions.

Underpinning these methods are four principles of learning experiences: work-place practice oriented; inquiry-based; active and experiential; and collaboration.

CONCEIVE-DESIGN-IMPLEMENT-OPERATE (CDIO) FRAMEWORK

The CDIO framework was developed by MIT to improve engineering education by aligning it to real-world contexts and practices. EDU assists schools/departments in adapting the framework to their curricula. It also participates in the international CDIO collaborators network and shares its CDIO experience with educators from the region.

INTRINSIC MOTIVATION

The initiative on intrinsic motivation (IM) aims to develop a growth mindset and self-directedness in students through a learning environment that supports their psychological needs of autonomy, relatedness and competence. EDU works with course chairs on re-designing curricula, to include engaging learning activities and interactions that promote a sense of engagement, connectedness and achievement, and through which students develop passion and purpose for their disciplines.

DESIGN THINKING

This is a key education initiative to support SP's Holistic Education and a work-ready, life-ready and world-ready graduate. Design thinking taps the collective creative potential of multidisciplinary teams. It uses the designer's sensibility coupled with deep user empathy to identify unmet needs and create solutions that matter to people. Integrating design thinking into the SP curricula broadens the knowledge, skills and perspective of our students, giving them the key ingredients to succeed in innovation. EDU works with course teams to infuse Design Thinking into the curricula and conducts multi-disciplinary design thinking workshops for staff and students.

LEARNING EXPRESS

The Learning Express seeks to promote Design Thinking and Social Innovation. It brings together students from various disciplines and partner institutions in Asia to co-create innovative solutions that strive to meet the needs of local communities in the region. The multi-disciplinary, multinational teams of students apply domain skills and the Design Thinking methodology to challenges such as clean water, alternative energy, food production and innovation, healthcare and social enterprise. The immersive experience in various communities and cultures in the region also provide students a rich learning experience of diversity and purpose for their discipline. EDU works with schools to organise Learning Express expeditions to communities in Asia.

PROFESSIONAL STAFF DEVELOPMENT

EDU offers an extensive range of training, specialised workshops and educational talks on current topics relating to teaching and learning. Workshops are tailored to key SP thrusts as well as specific school and department needs. The programmes are part of EDU's continuing efforts to provide the required training and support for SP's pedagogic leaders and lecturers.

CERTIFICATE IN TEACHING (HIGHER EDUCATION)

All new academic staff are prepared for their professional teaching role at SP through the Certificate in Teaching (Higher Education). This is a compulsory programme that provides key induction into good practices in learning design, teaching and assessment, as well as the use of information communication technologies in supporting student learning. An abridged version of the programme is offered to Adjunct Lecturers.

COURSE CHAIR PROGRAMMES

Programme for the Course Chairs provides support in the areas of Course direction, design, management and administration matters, including curricula design for Enhanced Internship and Earn-and-Learn Programmes. It aims to prepare course chairs for their dual roles of pedagogic leaders and course managers.

ACADEMIC MENTOR PROGRAMME

EDU conducts the Academic Mentor (AM) programme for academic staff on the teaching career path. The Academic Mentor programme aims to build a high level of pedagogic competence and the ability to mentor and coach academic faculty. The training will equip academic mentors with the capability to lead educational initiatives related to teaching quality and innovation.

OTHER PROFESSIONAL DEVELOPMENT ACTIVITIES

As part of its professional development efforts, EDU also hosts the annual Excellence in Education and Training Convention (EETC) that aims to introduce staff to a wide range of innovative educational practices. The EETC is also a platform to honour SP staff who, have excelled in teaching, pastoral care; education technology or other dimensions of teaching and learning. In addition, the department also organises monthly pedagogy meetings, a sharing platform for Deputy Directors (Courses) to share, identify and evaluate, as a community, the relevance of new developments in curriculum, teaching and learning, and ICT to their professional practice.

USING TECHNOLOGY IN TEACHING AND LEARNING

EDU provides education and technical expertise in the use of technology for teaching and learning. It works closely with academic schools to conceptualise and implement pedagogically viable blended learning e.g. Flipped Classroom, and the design and development of interactive courseware and instructional videos.

EDU manages an enterprise learning management system. The system allows students to access their learning materials, participate in quizzes and discussions, and submit assignments anytime, anywhere. EDU also evaluates and recommends relevant software applications.

EDU is the custodian department in SP's drive to infuse EduTech into teaching and learning. It works closely with academic schools to leverage EduTech to excite, engage, empower and evaluate students' learning. A resource-rich online portal, known as the EduTech Exchange, was set up to support staff in their EduTech journey.

MEDIA DEVELOPMENT

EDU offers video production facilities and multimedia design expertise to academic schools and departments. The Media Production Centre provides audio, video, animation and graphic production for the creation of web-based instructional materials and video packages. Services include:

- Teaching and Learning videos (instructional, documentary and animation style)
- E-Learning multimedia content
- Basic Video Production Mini-Workshops for staff and students
- Promotional videos for schools and departments
- Campus-level events video coverage

BA003M
CHINESE BUSINESS RESEARCH AND IMMERSION
Enables students to participate in an immersion programme to China. Students will research on a specific aspect of Chinese business practice and on an industry-specific business issue in the course of this immersion.

BA009M
GOVERNANCE AND AUDIT PRACTICUM
Enables students to apply their theoretical concepts of audit and accounting in practice, through a practical auditing/accounting work attachment experience in a voluntary welfare organisation/charity body.

BA010M
BUSINESS AND PERSONAL INSIGHTS AND PERSPECTIVES
Enables students to get a broader perspective of the business and economic environment, to explore strategy models and apply these in a business case study analysis. It also allows them to develop personal skills in negotiations, impromptu and public speaking.

BA126M
RESEARCH PROJECT
Enables students to participate in a joint research project on issues such as governance of voluntary welfare organisations and the corporate giving culture in Singapore Stock Exchange listed companies.

BA0162
MEDIA AND PROMOTIONAL PUBLICITY
Provides students with an understanding of the importance of media relations and the different ways to generate publicity through the mass media. Students also learn how companies, their products and services can be promoted using special events, corporate websites, newsletters and audio-visual materials.

BA0163
MARKETING COMMUNICATIONS
Aims to provide students with an understanding of the role of promotion within the overall marketing mix strategy of an organisation. It covers some contextual topics such as the communications process, consumer decision-making and promotional planning, as well as the core topics pertaining to the use of Advertising, Sales Promotion, Public Relations, Sponsorship, Point of Purchase and Personal Selling in an integrated promotional mix.

BA0173
SUPPLY CHAIN MANAGEMENT
Introduces the concepts and challenges of supply chain management (SCM). It covers the theoretical principles underlying key supply chain processes and also provides some insights into how these principles are applied in real-world situations. Students will also understand the role of information technology in SCM.

BA0176
GLOBAL BUSINESS ENVIRONMENT
Aims to provide students with the skills and knowledge for global market analysis and the formulation of international strategies. It will provide students with an understanding of the rationale for developing an external economy, the impact of environmental forces, the role of international organisations/groupings like WTO and NAFTA, and opportunities in emerging markets.

BA0183
SELLING AND SALES MANAGEMENT
Provides students with an understanding of the principles and techniques of personal selling and sales management. Key topics of selling such as the right approach to prospecting, making a convincing sales presentation, meeting objections correctly, and closing a sale are included. In the sales management component of the module, students will be taught how to analyse the sales environment, do a sales plan, organise a sales force, forecast sales and design a sales compensation scheme.

BA0206
INDEPENDENT STUDY PROJECT
Seeks to develop the students' critical understanding of a field of study and their capacity to pursue independent research, culminating in the research assignment which will demonstrate their knowledge and competence in the chosen field of specialisation.

BA0209
FINANCIAL AND MANAGEMENT ACCOUNTING
Provides students with an understanding of financial accounting, covering company and group financial statements. Students learn to prepare final accounts of companies and to read and understand published accounts. They will also learn to analyse and interpret financial statements using tools such as horizontal and vertical analyses. Budgeting, breakeven/incremental analyses and activity-based costing will also be taught to assist in management planning and control.

BA0217
FUNDAMENTALS OF ECONOMICS
Provides students with an overview of concepts and issues in both micro and and issues in both micro and macro economics. Topics include scarcity and choice, demand and supply, cost and revenue, business cycles and economic indicators, fiscal and monetary policies, and international trade and finance.

BA0220
ORGANISATIONAL MANAGEMENT
Provides students with basic knowledge in management principles and organisational behaviour. Focuses on topics such as decision-making, organising, attitudes, personality, group dynamics, motivation, leadership and interpersonal skills.

BA0227
ESSENTIALS OF FINANCE
Provides students with a basic understanding of financial terms and concepts with specific emphasis on equipping them with the ability to read financial statements and reports.

BA0231
CUSTOMER RELATIONSHIP MANAGEMENT
Introduces the basic concept of customer relationship management and its strategic importance in today's business environment. It also discusses the various tools commonly employed by organisations to manage customer data, develop customer loyalty and improve customer profitability.

BA0232
BUSINESS PLANNING FOR NEW VENTURES
Introduces students to the process of starting a new venture. It provides students with a basic understanding of the financial, operational and marketing issues involved in setting up and managing a small business.

BA0247
INTERNET PROGRAMMING
Provides fundamental concepts and skills for Internet programming. Students will be taught client-side web programming using VBScript. Students will learn to create Active Server Pages (ASP) and ActiveX Data Objects (ADO), and integrate Microsoft Access database into Web applications using ADO and Open Database Connectivity (ODBC).

BA0275
BUSINESS ACCOUNTING
This module will provide students with an understanding of the fundamental accounting principles underlying accounting practice, from the preparation of accounting records to the financial statements of a company. It will also cover accounting for cash, property, plant and equipment as well as Goods and Services Tax. Students will learn how to analyse and interpret a simple set of financial statements for a company.

BA0276
ACCOUNTING
Provides students with an understanding of the basic concepts and principles of accounting. Significant areas are the double entry concept, accounting process, accounting for cash and bank, and the financial statements of service and merchandising businesses.

BA0299
PRINCIPLES OF IMPORT-EXPORT TRADE
Introduces students to the basics of trade, practical aspects of importing and exporting goods, and the various shipping documents commonly encountered in shipping goods internationally by both sea and air freights. Students will also be exposed to INCO terms, shipping procedures and shipping terminologies.

BA0300
BUSINESS AND TECHNOLOGY
Technology can transform business and therefore businesses must understand the technology available to them. This module teaches students the emerging trends in technology as they relate to a wide variety of businesses. Students will also learn strategies to apply technology based on business models. At the end of the module, students will be able to identify and recommend various technology tools and platforms to transform business in an industry specific to their course of study.

BA0302
INTERNATIONAL MANAGEMENT
Exposes students to the knowledge and skills needed to function in a multinational corporation. It focuses on key concepts and techniques essential to operate in a multinational environment and adapting management practices to different economic, political and cultural environments.

BA0303
OVERSEAS BUSINESS STUDY MISSION
Requires students to go on an intensive study mission to a foreign country to witness and experience how international business and trade are conducted and to seek potential business opportunities. Students learn by attending seminars, visiting government ministries and companies. They will be given ample opportunities to meet and network with business people and visit special events such as trade shows.

BA0312
PRINCIPLES OF MARKETING
Introduces students to basic principles and concepts of marketing. The topics that will be covered include an overview of the strategic marketing management process, an appreciation of the marketing environment, an understanding of target market selection, as well as the management of the marketing mix elements that include the 4P's namely: Product, Price, Place and Promotion.

BA0313
ESSENTIALS OF FINANCIAL MANAGEMENT
Provides students with an understanding of basic accounting and financial concepts essential in understanding and interpreting financial statements and reports. In addition, students will be exposed to financial techniques such as time value of value and capital budgeting.

BA0314
MARKETING INTELLIGENCE
Provides students with a working knowledge of the research techniques used in marketing intelligence and research. Topics dealt with include research designs, sampling techniques, data collection methods, fieldwork operations, data analysis, and preparation of research reports.

BA0316
EMOTIONAL INTELLIGENCE
This module is designed to introduce and evaluate the competencies of emotional intelligence. Students will be able to describe the difference between intellectual and emotional intelligence.
This module will study the different emotional intelligence competencies framework that covers Know Yourself, Choose Yourself and Give Yourself. Students will discover their own self-awareness and techniques through the SEI Assessment (Six Seconds Emotional Intelligence Assessment).
Its primary goal is to help students become familiar with the many theories of emotional intelligence, building better self-awareness, management and direction through the practice of emotional intelligence elements and practising the infusion in the real world.

BA0330
INTERNET MARKETING
Examines how the functional aspects of the marketing process can be enhanced through application of technological developments on the Internet. It also delves into issues of concern arising from the use of the Internet in the marketing domain, and how they impact on the marketing of goods and services to consumers.

BA0347
MARKETING INTELLIGENCE & RESEARCH
Provides an overview of marketing intelligence, marketing survey research and illustrates how these can be interpreted to help an organisation make sound decisions. Topics covered include competitive intelligence, research designs, data collection methods, data analysis, fieldwork operations and preparation of research reports.

BA0348
CONSUMER PSYCHOLOGY
Provides students with an understanding of why and how individuals and groups engage in consumer activities and the cognitive processes and behaviour involved when people purchase and use products and services.

BA0349
CHANGE MANAGEMENT
Provides students with insights to different change models and how they are suitable for different types of organisation change. It also examines the complexities, pitfalls and resistance experienced during change implementation, including the role of leadership in sustaining organisation change.

BA0352/BA0353
ENTREPRENEURSHIP PRACTICUM 1 & 2
This module provides students with hands-on, practical and intensive learning opportunities. Students create business of economic and/or social value by developing core capabilities of idea generation, opportunity recognition, resource acquisition and entrepreneurial management. Entrepreneurship students will learn to shape entrepreneurial opportunities, assess financial feasibility, while living an entrepreneurial experience. This experience includes forming teams, constructing business models, talking with partners and customers, assessing feasibility, while launching a new venture or initiative. The skills and competencies gained are vital for success in business or organisation, including from start-ups, corporations, non-profit, global, non-profit global franchises or any other setting.

BA0354
ENTREPRENEURSHIP AND SMALL BUSINESS
This module discusses the concept of entrepreneurship and the characteristics of small enterprises. Students will also learn the business strategies used by small enterprises to create a sustainable competitive advantage in the dynamic business environment.

BA0358
FUNDAMENTALS OF MARKETING
Introduces students to the basics of marketing. Topics include the strategic marketing management process, market opportunities analysis and target market selection. The elements of the marketing mix will also be examined. An integrated approach will be adopted to discuss how these elements can be blended to produce an effective marketing programme.

BA0365
COSTING AND COMPANY LAW
Introduces students to the basics of costing and variance analysis, including marginal and absorption costing. Issues of transfer pricing between related companies will be covered. Students will learn the basic concepts of company law, insolvency law and also explore the impact of law on the accounting profession.

BA0367
PROFESSIONAL PREPARATION AND PERSONAL BRANDING
Aims to introduce the essential skills needed by a business executive to function effectively in the business world. The module includes a component on 'personal branding' to guide the student to develop a personal brand identity that will aid him or her to project and establish an image appropriate for the profession.

BA0368
INVESTMENT ANALYSIS
Provides financial techniques to perform profitability analysis of capital investment and introduces Bloomberg analytics as practicum to perform portfolio research and analysis.

BA0369
PROFESSIONAL PREPARATION
Aims to equip students with skills in developing a personal branding to project an image that is distinct and memorable that would help them in their career and personal life.

BA0371
MARKETING MANAGEMENT
Emphasises two key areas: integration and application of marketing concepts learnt from the course and other specialised marketing modules to a client-based project. Topics include situation analyses, marketing objectives and strategies, and implementation and control of marketing activities.

BA0372
FUNDAMENTALS OF ECONOMICS
Provides students with an overview of concepts and issues in both micro and macro economics. Topics include scarcity and choice, demand and supply, cost and revenue, business cycles and economic indicators, fiscal and monetary policies, and international trade and finance.
Synopses for new modules

BA0374
INTEGRATED DIGITAL MARKETING
Aims to provide students with an understanding of the integrated role digital marketing has within a marketing mix strategy & communications framework. Students will be taught core topics & principles in digital marketing and marketing communications; with an emphasis on emerging tools such as content marketing, user journey mapping, online public relations & digital campaign reporting to enhance customer lifecycles within a full marketing communications strategy.

BA0377
SERVICE EXPERIENCE & INNOVATION
This module aims to instil a wide repertoire of user research methods, observational and analytical methods will be taught to allow students to understand the users as social beings interacting with spaces, objects and time. Students will also be equipped with facilitation skills to engage users at various levels in order to identify potential design outcomes and entrepreneurial opportunities.

BA0378
CUSTOMER SERVICE & SALES MANAGEMENT
Through an industry project, students will learn that it is important for all organization(s) to clearly define customer service, to design a communication and implementation system to deliver service excellence and to identify key performance indicators for measurement. In this module, students will see the connection between service excellence and sales and that "the better you serve the more you will sell". The Sales Management aspects of this module will include determining how an organisation recruits, selects and trains its sales force and how to critique a sales management system.

BA0379
LOGISTICS OPERATIONS
This module provides students with a better understanding of logistics operations from the perspective of transportation and warehousing. It also discusses the importance of efficient logistics operations to businesses.

BA0380
BUSINESS OPPORTUNITY
With this module, students will begin by learning the fundamentals of how to identify and evaluate opportunities. They will learn business ethics, then explore ways to shape and evaluate the viability of business opportunities by understanding key industry, market and competitive factors as well as customer needs. Students will also understand and evaluate different forms of business models, after which they will create and assess the feasibility of their business ideas before developing their business plans.

BA0381
BUSINESS INNOVATION & PROCESS
This module focuses on idea generation and the use of design thinking to identify new opportunities. Students will be introduced to a range of design thinking tools that will help them to innovate and experiment in a collaborative and entrepreneurial setting. Student will also be equipped with facilitation skills to engage users at various levels in order to observe and identify potential problems. At the end of the module, students will be able to present a proposal from conceptualisation to ideation and prototyping by applying the design thinking methodology.

BA0382
BUSINESS OPERATIONS & PROCESSES
This module gives students an appreciation of the key operations functions in business, and an understanding of the basic concepts to design, manage and improve operations and processes in manufacturing and service industries.

BA0383
BRAND MANAGEMENT
Students will be introduced to theories and concepts of branding, and exposed to case-based teaching featuring successful branding strategies that have been adopted by organisations worldwide which have catapulted strong brand positioning and equity. The module is designed to enable students to manage key elements of a strong brand strategy and to equip students with knowledge and skills to design and implement both strategic and tactical integrated branding strategy that would increase the organisation's brand value and business.

BA0384
RETAIL MANAGEMENT
This module focuses on the challenges and emerging trends in the retail industry and the operational and strategic decisions required for the business and evaluate their implications on marketing a retail business. Students will learn how to apply relevant integrated traditional and new media marketing concepts to enhance consumer shopping and buying experience.

BA0385
SERVICE OPERATIONS
The module is designed to provide students with an understanding of the analysis, decision making and implementation issues of managing the operational aspects of a service. Students will be taught concepts and decisions such as location, layout, capacity, inventory, distribution and quality assurance. It focuses on the quality of customer satisfaction and prepares students to discover creative entrepreneurial opportunities.

BA0386
MARKET FEASIBILITY & BRANDING
This module equips students with the essential skills required to understand markets, customers and trends, conduct feasibility studies, interviews and observation, to develop a brand strategy and to create a marketing plan for their business. Students will understand the importance of branding and gain valuable skill-sets related to branding a business.

BA0387
START-UP FINANCE
The module introduces students to raising capital to fund a new venture. Students will be exposed to an array of options and considerations before deciding upon the best approach for financing their business, for example, various aspects of funding for small start-ups including the possibility of planning and executing a crowdfunding campaign for their entrepreneurial venture. Students will also learn about exit strategies, valuation, deal structures, scenario planning and how to pitch their business ideas to obtain funds for their start-up.

BA0388
APPLIED INDUSTRY PROJECT (MARKETING MANAGEMENT)
This semester-long supervised final year project module will require students to formulate a marketing proposal in response to a real problem or client project of an industry partner. Students will work in teams and will adopt agency-style of handling their industry client. They will apply design thinking, analytics, research, and problem-solving skills accumulated and developed from all other modules to help solve their client's marketing problem. The project strives for a holistic integration of all students' skills and understanding before they progress to internship/graduate.

BA0389
DIGITAL MARKETING
Equips students with the knowledge and skills to use digital marketing effectively and ethically. Students will learn the key features of popular social media platforms that digital marketing agencies and businesses use to reach out to their consumers. They are also taught how to plan and design social media marketing strategies and campaigns that can be integrated with traditional marketing methods.

BA0390
PROJECT & CHANGE MANAGEMENT
This module provides students an opportunity to integrate project management skills and knowledge acquired from the course. Students will also learn how to use Microsoft Project to manage a project. Students will gain insights to different change models and how they are suitable for different types of organisation change. It also examines the complexities, pitfalls and resistance experienced during change implementation, including the role of leadership in sustaining organisation change.

BA0391
E-COMMERCE OPERATIONS & TECHNOLOGY
This module introduces students to e-commerce in Singapore and its neighbouring countries. Students will understand the overall structure for an effective e-commerce system. It will prepare students with basic concepts and knowledge of how e-commerce system works.

BA0392
BUSINESS NEGOTIATION SKILLS
Students will be taught the key principles of negotiation and strategies to develop effective business negotiation skills. At the end of the module, students will be able to appreciate the influence of psychology and culture on business negotiation and conflict management and develop effective negotiation strategies.

BA0397
LEADERSHIP & PROJECT MANAGEMENT
This module provides students an opportunity to integrate entrepreneurial knowledge, organisational behaviour, information systems, operations and project management skills. Students will gain insights to getting the right people and systems in place, managing with limited resources, leadership and delegation, turning around a troubled business, establishing and communicating culture, and creating a vision to drive the business beyond start-up.

BA0398
HUMAN RESOURCE MANAGEMENT PRACTICES
Provides students with an understanding of the importance of human resource management in an organisation. Key topics include human resource planning, recruitment and selection, training and development, performance appraisal, compensation, fundamentals of employee and industrial relations and the Employment Act, Singapore.

BA0399
INTERNATIONAL TRADE OPERATIONS
This module introduces students to the basics of import/export and trade documentation from a trader's perspective. It covers essential trade and shipping documents, methods of payment, INCO terms and the practical aspects of importing and exporting goods in Singapore, including customs procedures. The module is highly relevant for anyone interested or involved in international trade.

BA0400
BUSINESS LAW
Commences with the basic features of the Singapore legal system. It then proceeds to introduce students to the basic principles of contract law, the Sale of Goods Act, the law of tort, cheques, agency and intellectual property. The legal aspects of business organisations will also be covered.

BA0406
GAMING OPERATIONS AND MANAGEMENT
Aims to provide an introduction and understanding of the basic principles involved in the operations and management of the gaming industry. Gaming is present in our everyday lives and the students will see and understand why this industry has become so successful today.

BA0409
RESORT MANAGEMENT
Emphasises on the various types of resorts available worldwide including how to operate and manage a successful resort. The module also covers Spas and the major role it plays in resort operations. Students are also taught real-life scenarios that allow them to use their Emotional Intelligence (EI), an important skill in working with people in the industry.

BA0416
SERVICE QUALITY MANAGEMENT
Aims to create a 'mindset for service' among students to equip them with skills and knowledge in providing excellent service for future employment in service industries. It also provides a broad understanding of service management concepts covering hospitality and tourism service operations, Service Profit Chain, Customer Satisfaction, Customer Loyalty, Total Quality Management and Emotional Intelligence (EI) with application to services in the tourism industry.

BA0418
SPONSORSHIP MARKETING IN TOURISM
Focuses on sponsorship as a critical component of marketing in the tourism industry. This equips students with an understanding of the paradigm shift in marketing today. The basics of branding, customer experience management and database marketing are included to complement and improve the efficacy of sponsorship as a marketing tool. Emotional Intelligence deemed to be an important skill both in business and in life are also incorporated in the module.

BA0419
INTRODUCTION TO HOTEL AND RESORT OPERATIONS
Aims to introduce students to the organisational structure and operational mechanics of how the departments of hotels and resorts operate. It studies the front-of-house and back-of-house systems, the use of the hotel Property Management System (PMS), Opera, the standard operational procedures and controls associated with a modern hotel and resort. Elements of Emotional Intelligence (EI) are also taught and practised during the practical training sessions to further enhance the EQ and professionalism of the students.

BA0433
FOOD AND BEVERAGE MANAGEMENT
This module aims to provide basic learning of the various management skills required in Food and Beverage. In addition, the module will involve operational service aspects in a restaurant. Students will be equipped with the 'tools' in operating a successful restaurant. A compulsory hands-on training in a regional resort is also part of this module. In addition, elements of Emotional Intelligence are also taught and practiced in the hands on training of this module.

BA0421
EVENTS MANAGEMENT
Gives students an understanding of the principles and practices of Events Management which covers the MICE industry. Topics covered include fundamentals of organising business meetings and seminars, incentive travel programmes, conventions, exhibition and trade shows. Students will also learn about accommodation, data management and other services for international participants of these events.

BA0422
AIRLINE AND CRUISE MANAGEMENT
Provides an introduction to basic operational and management aspects of air and cruise travel. Students will have a profound knowledge of airline ground handling operations and current trends in cruising.

BA0424
TRAVEL AND TOURISM PRACTICES
Provides students with an overview of the travel agency business, both inbound and outbound, in Singapore and the current issues relating to it. Students will learn the practices involved in designing, selling tourism products and travel related services with the application of Emotional Intelligence (EI) competencies. They will also be acquainted with the application of IT in travel operations.

BA0430
FRONT OFFICE OPERATIONS
This module will provide coverage on the history, development and organizational structure and operational skills necessary to run an effective Front Office operation. The students will have an in-depth understanding on the key sections that make up Front Office and more importantly, learn about the complex interrelationships of these sections that are crucial in seamless service delivery and guest satisfaction. The module will also introduce students to the OPERA Property Management Systems with emphasis on Reservations, Front Office and Rooms Management. The students will be equipped with the necessary skill and knowledge to operate and perform key functions relating to reservations, guest profiles, setting options and requests, assigning of rooms, checking in/out and guest accounts management to highlight revenue management and customer relationship management. further enhance the EQ and professionalism of the students.

BA0431
ATTRACTIONS OPERATIONS
Provides an introduction to the various classifications of attractions. Students will have knowledge of key areas in operations of an attraction and the factors that are critical for its success. There will be active discussions on challenges that attractions around the world face such as environmental and sustainability.

BA0432
HOTEL SALES AND MARKETING
Designed to provide students with an introduction to the Marketing Division in a hotel. Hotel Sales and Marketing studies the functions of the key departments that form this Division, namely Room Sales, Event Sales, Revenue Management and Marketing Communications. The highlight of this course would be Sales Management, preparing the students for exciting careers such as Corporate Sales Executive, Government Sales Executive, Tour and Travel Sales Co-ordinator and Events Sales Executive. The sales techniques they learn will be specific to the hospitality industry, enabling them to be work-ready when they commence working in this industry.

BA0488
APPLIED INDUSTRY PROJECT (OPERATIONS MANAGEMENT)
This semester-long supervised final year project module will require students to propose a business operations solution in response to a real-world problem faced by an industry client. Students will work in teams, and apply design thinking, data analytics, and problem-solving techniques acquired from other modules in earlier semesters. The project strives for a holistic integration of students' technical skills and competencies before they progress to internship/graduate.

BA0506
EMPLOYEE AND INDUSTRIAL RELATIONS
Provides students with an understanding of the current industrial relations climate, the tripartite system, employee engagement and involvement programmes, industrial relations negotiation process, issues and problems encountered by management in dealing with their employees and/or unions. Elements of Emotional Intelligence (EI) are also infused into the module to enhance the EQ of the students.

BA0508
ECONOMICS
Economics will provide students with an understanding of the micro and macroeconomic concepts and applications which are needed in decision-making processes in the business world. It also enables students to have a better understanding and appreciation of the larger economic environment that they are facing.

BA0509
MANAGEMENT AND HUMAN RESOURCE PRACTICES
Management & human resource practices covers the management functions performed by managers, skills and competencies required of managers and organisational behaviour concepts. It highlights the importance of managing human resources and the responsibilities of a manager in carrying out the human resource functions.

BA0701
INTRODUCTION TO PSYCHOLOGY
Introduces students to the basic information for understanding themselves better, helping them to be more aware of the implications of psychology on the behaviour of people. Key topics include Learning and Conditioning, Memory, Perception, Developmental Psychology, Abnormal Psychology and Personality.

BA0702
APPLIED PSYCHOLOGY IN EFFECTIVE WORK RELATIONSHIP SKILLS
Introduces students to theories and practical applications of basic counselling skills to build good interpersonal relationships in both personal and work contexts. Topics covered include basic counselling and psychotherapy theories and techniques, application of knowledge in the business context, and Neuro-Linguistic Programming. Students will practise these skills in class demonstrations and simulated business case studies.

BA0703
WORK GROUP DYNAMICS AND SOCIAL PSYCHOLOGY
Introduces students to the influence of social psychology on work group dynamics and processes. The concepts of a support group and the psychological aspects of group processes from initial forming to final termination will be introduced through readings and hands-on practices. An appreciation of social psychology, conflict management in work group contexts, and abnormal psychological disorders over lifespan will also be given.

BA0711
ECONOMIC ANALYSIS
Equips students with deeper knowledge of microeconomic and macroeconomic theories so as to draw out relevant applications to real-life economic events. Topics covered include analysis of key economic models and principles, economic growth models, business cycles and impact of monetary and fiscal policies.

BA0721
ENTERPRISE MODELS
Introduces participants to three business models for entrepreneurs – retail, franchising and licensing, and online businesses. Since retail is an important sector in Singapore's service industry, any aspiring entrepreneur should have knowledge of opportunities in retail. Participants will also be introduced to opportunities in franchising and licensing and online businesses.

BA0722
ENTREPRENEURIAL FINANCE FOR DECISION-MAKING
Examines the elements of entrepreneurial finance, focusing on essentials of financial management related to start-up ventures and early stages of company development. Tutorials will address key questions which challenge all entrepreneurs: start-up costs, sources of funds and eligibility for government funding. Participants will be able to make financial decisions that will ensure long-term profitability.

BA0723
BUILDING THE ENTREPRENEURIAL ORGANISATION
Teaches students about starting, managing and building the entrepreneurial organisation in today's world of rapid technological development and economic uncertainty. The use of diagnostics, case studies, discussion topics and assignments cover critical themes that include character traits of successful entrepreneurs, relationships and networks, entrepreneurial leadership, innovation, culture, creativity, and building organisational and strategic capabilities in the context of a new, small firm.

BA0724
ENTREPRENEURIAL MARKETING
Focuses on what entrepreneurs need to know about marketing. It is exciting, intensive and covers topics on customers' needs and value creation, marketing research, strategies and tactics, sales and negotiation, building strong brands, business-to-business as well as business-to-consumer marketing. The hands-on approach to this module will help participants connect an entrepreneur's business idea to the marketing process required to capture customers and attain desirable sales performance.

BA0725
BUSINESS PLAN PROJECT
Requires participants to write a business proposal. They will identify and quantify market opportunities and plan to start a new enterprise. Topics include opportunity assessment through an environmental analysis, marketing propositions, resource management and a financial feasibility study. This module is intended for those who want to start their own business or further develop an existing business.

BA0731
AUDIT AND ASSURANCE
Introduces students to the concepts, processes and need for assurance and internal controls in companies. It allows students to gain knowledge on how to gather evidence for audit engagements and also explores the ethics behind the accounting profession.

BA0732
PRINCIPLES OF TAXATION
Provides students with an understanding of the objectives, types of tax and tax administration. It explores areas of personal income tax, corporate tax as well as goods and services tax.

BA0733
COSTING AND COMPANY LAW
Introduces students to the basics of costing and variance analysis, including marginal and absorption costing. Issues of transfer pricing between related companies will be covered. Students will learn the basic concepts of company law, insolvency law and also explore the impact of law on the accounting profession.

BA0801
STATISTICS
Provides students with an understanding of basic statistics concepts and their relevance to the business environment. Topics covered include descriptive statistics, probability distributions, sampling, estimations, hypothesis testing, chi-square, analysis of variance, linear regression and correlation, and index numbers. Statistical software and computer-based learning (CBL) packages are also introduced.

BA0804
PERFORMANCE MANAGEMENT
Provides students with an understanding of the importance of performance management in an organisation. Topics such as performance management process, methods for assessing and managing performance will be covered. Students will develop skills in conducting performance reviews and handling difficult situations in performance management. Elements of Emotional Intelligence (EI) are also infused into the module to enhance the EQ of the students.

BA0806
HR INFORMATION SYSTEM
Introduces students to the importance of using a HR Information System (HRIS) to manage employee information and how an effective HRIS can meet the informational needs of Human Resources. There will be hands-on practices on a leading HRIS software.

BA0808
GLOBAL HRM (HUMAN RESOURCE MANAGEMENT)
Provides the foundational building blocks for students to relate the impact of internationalisation of organisations to their HRM practices, in particular, the increasing challenges and choices available within international HRM. Global HRM is characterised by HRM practices that cut across cultures and national boundaries. Elements of Emotional Intelligence (EI) are also infused into the module to enhance the EQ of the students.

BA0810
PSYCHOLOGY IN WORK BEHAVIOUR
Introduces students to work psychology in an organisation. Areas covered include the impact of work motivation and satisfaction, learning styles and vocational choices of employees. This enables students to act as facilitators in employee development. Elements of Emotional Intelligence (EI) are also infused into the module to enhance the EQ of the students.

BA0813
EMPLOYMENT LAW
Provides students with an understanding and appreciation of Singapore's employment law which include the Employment Act, Industrial Relations Act, Trade Unions Act, Trade Disputes Act, Work Injury Compensation Act, and the Retirement and Re-employment Act.

BA0814
PSYCHOLOGY IN COUNSELLING
Introduces the theories and practical applications of basic counselling skills in both organisational and business contexts. Topics include basic counselling and psychotherapy theories, techniques, and application of these knowledge and skills at the workplace. Students will have the chance to practise and apply these skills in class demonstrations. Elements of Emotional Intelligence (EI) are also infused into the module to enhance the EQ of the students.

BA0815
NEGOTIATION AND CONFLICT MANAGEMENT
Aims to expose students to the influence of social psychology on organisation negotiations and conflict management. Conflict management styles would be identified and negotiation skills are applied to effect a cooperative, win-win negotiation by applying psychological and sociological theories to practical situations. Elements of Emotional Intelligence (EI) are also infused into the module to enhance the EQ of the students.

BA0818
RESEARCH METHODS
Provides students with a working knowledge of the research techniques used in Human Resource Management research. Topics dealt with include research systems and activities, research designs, data collection methods, data analyses, fieldwork operations and preparation of research reports.

BA0819
LEARNING AND TALENT DEVELOPMENT
Provides students with knowledge of training and development issues. Students will be taught the different aspects in conceptualising, designing, implementation and evaluation of the training programmes. Apart from the theoretical concepts, students can look forward in putting these theories into practices through role-plays, industrial speakers/ visits and hands-on activities.

BA0820
TOTAL REWARDS MANAGEMENT
Introduces students to the importance of using total rewards to attract, retain and motivate employees in an organisation. Elements of total rewards, pay model, job evaluation, salary surveys, pay structure, linking pay and performance, employee benefits and services and work-life strategy will be covered. Students will also learn local practices of pay administration and wage systems.

BA0821
TALENT SOURCING AND ACQUISITION
Provides students with an understanding of the importance of talent sourcing and acquisition of staff in an organisation. Recruitment methods and selection techniques that are relevant and useful to the assessment of candidates' skills and competencies will be covered. Students will develop skills in recruitment and selection through simulation exercises. Elements of Emotional Intelligence (EI) are also infused into the module to enhance the EQ of the students.

BA0823
INTEGRATED HUMAN RESOURCE PROJECT

BA0824
HR ANALYTICS
This module provides students with a working knowledge on the key HR Analytics principles that will allow them to apply the right concepts and principles to their respective work environment. Students will go through a series of analytics exercises from problem definition to data collection and preparation, to data analyses and storytelling, where they will learn and practice the tools and techniques to turn data into useful insights for decision making. They will also learn about specific HR functional analytics, such as talent acquisition, learning and development, compensation and benefits, and employee engagement.

BA0902
LAW RELATING TO INTERNATIONAL BUSINESS
Provides students with an understanding of the general aspects of law and an appreciation of how they facilitate decision-making in the context of international business. Students will also be taught the salient provisions of selected Treaties and Free Trade Agreements.

BA0903
INTERNATIONAL RELATIONS
Aims to introduce the basic concepts and theories of international relations. The key areas of discussion include examining the political and military relations among states, international political economy and the politics of global welfare (e.g. the environment, resource scarcity, north-south relations, poverty, disease, hunger, and human rights).

BA0904
LEADERSHIP AND EMOTIONAL INTELLIGENCE
Aims to provide students with an understanding of the key principles of leadership and emotional intelligence, and to impart an understanding of the essential elements that make an effective leader. Students will learn self-awareness and people skills to manage group emotions during conflict and change.

BA0905
GLOBAL SUPPLY CHAIN MANAGEMENT
Provide students with the basic concepts and global perspective of supply chain management (SCM) and its relation to international business strategy. It covers end-to-end global supply chains and processes, particularly in supply chain strategies, sourcing, inventory management, distribution, transportation, reverse logistics and supply chain outsourcing. In additional, the impact and role of information technology will also be discussed. With its international focus, this module will enhance the students' global understanding necessary to address the challenges of our dynamic and interdependent world.

BA0906
INTERNATIONAL FINANCE
Introduces students to the international financial markets and the necessary concepts and skills in global financial management. Students will learn about foreign exchange market, various approaches in international financing, transfer pricing issues, financial exposures, risk management derivatives and strategies.

BA0907
CULTURAL INTELLIGENCE
Aims to provide students with a good understanding of the different dimensions of culture and the concept of ethics in business. It aims to strengthen the student's ability to understand, predict and handle diverse situations that occur in a multicultural work environment.

BA0908
DOING BUSINESS OVERSEAS
Requires students, working in teams, to apply their business knowledge in the real-world by engaging the industry in client-based projects. The project teams will need to investigate the feasibility of venturing into targeted overseas markets and recommend the most suitable market entry mode. Each project team must submit an initial business plan and make a formal presentation to the client.

BA0909
INTERNATIONAL MARKETING AND RESEARCH
Aims to provide students with the knowledge, techniques and skills essential for scanning foreign markets for customers and suppliers. Students will then learn to develop appropriate marketing strategies based on the results of the research.

BA0910
INTERNATIONAL BUSINESS STRATEGY
Aims to provide students with various frameworks for strategic analysis and decision-making in a global perspective, and introduce them to various business-level and foreign market-entry strategies.

BA0912
INTERNATIONAL BUSINESS STRATEGY
Aims to provide students with various frameworks for strategic analysis and decision-making in a global perspective, and introduce them to various business-level and foreign market-entry strategies.

BA0913
INTERNATIONAL SUPPLY CHAIN MANAGEMENT
Provides students with the basic concepts and global perspective of supply chain management (SCM) and its importance to businesses. It covers the theoretical principles underlying key supply chain processes, including distribution, sourcing, transportation, demand management, inventory management, reverse logistics and supply chain outsourcing.

BA1239
PRINCIPLES OF GLOBAL MARKETING
Recognise the importance of overseas markets for Singapore's goods and services. It introduces students to be intricacies of marketing mix when marketing overseas.

BA1253
INTEGRATED ACCOUNTING PRACTICE
This hands-on module is designed to provide students with a platform to apply and integrate knowledge and skills acquired from other modules. Students will learn about the accounting functions of a company through designing and maintaining a full set of accounting records, preparing published accounts and computing tax returns. In addition, they will get to design business analytic reports to aid management in decision making and meet the information needs of the business and apply knowledge and skills learned from the auditing module to perform an audit on the accounts prepared by another group of students.

BA1260
FINANCIAL ACCOUNTING
Develops students' ability to prepare financial statements for partnership, companies and small entities, in accordance to the Singapore's Financial Reporting Standards (FRS). Topics covered include FRS Preface and Framework, inventories, property, plant and equipment, impairment of assets, provisions and contingent liabilities and events after reporting period. Students will also apply FRSs to various business situations and prepare the statement of cash flows.

BA1261
ADVANCED FINANCIAL ACCOUNTING
Introduces students to more complex accounting topics on group accounting (including accounting for subsidiaries and associates using consolidation procedures), accounting for changes in foreign exchange rates, financial instruments, deferred taxation and accounting for leases.

BA1262
COST & MANAGEMENT ACCOUNTING
Develops students' understanding of the basic mechanics of a cost accounting system, thereby enabling them to account for various cost elements, such as materials, labour and overheads, in a manufacturing concern as well as appreciate contemporary issues relating to costing. They will also be able to understand the different concepts for stock valuation profit measurement and relevant cost information for basic managerial decision-making. Basic analysis of changes in operation performance resulting from changes in budgeted sales and production volumes will also be introduced. Topics covered include absorption and marginal costing, cost volume profit analysis, job order costing and budgeting.

BA1263
ADVANCED COST & MANAGEMENT ACCOUNTING
Building on concepts learnt in the core Cost & Management Accounting (CMA) module, the advanced CMA module applies the concepts to aid management in their planning, control, performance evaluation and decision making processes. Concepts learnt on basic product costing system are extended to cover specialised costing methods such as activity based costing, process costing, joint and by-product costing. Further to the use of budgeting as a planning tool, which is covered in the core CMA module, the use of budgets as a control and performance evaluation tool in standard costing and variance analysis will be covered here. Decentralisation, performance evaluation of decentralised units,

transfer pricing, relevant costing for more complex decision-making and contemporary issues are further applications of the concepts learnt in the core CMA module.

BA1264
AUDITING
Aims to provide practical guidance in the application of audit concepts and audit documentation. Using a case study audit of a Singapore incorporated company, the student assumes the role of a junior auditor in applying the relevant audit procedures to uncover common audit misstatements for the audit partner's review.

BA1265
ADVANCED AUDITING
Building on the concepts covered in the core audit module, this advanced audit module aims to provide practical audit guidance through various case studies relevant to the audit planning process and other areas of audit complexity. The student will assist the Audit Partner to improve the overall audit effectiveness by identifying audit exceptions and recommending suitable responses for the Audit Partner's approval.

BA1266
TAXATION
Introduces students to basic principles and practice of Singapore Taxation and equips students with working knowledge of tax administration, goods and services tax and skills to prepare tax computation for individuals, sole traders, partnerships and companies.

BA1267
ADVANCED TAXATION
Develops students with working knowledge of foreign tax relief, double taxation, major relief schemes under goods and services tax, tax incentives for investments, mergers and acquisition and tax computation of investment holding companies.

BA1268
BUSINESS & COMPANY LAW
This module incorporates the basic principles of business law namely the Singapore Legal System, law of contract and tort. It also focuses on Company Law relating to the formation and governance of the various business organisations in Singapore and the Company's corporate personality and powers, the internal and external relationships between the Company and its shareholders, company directors and creditors so as to enable students to appreciate the legal rights, responsibilities and risks present in the business setting.

BA1269
BUSINESS STRATEGY AND ETHICS
Equips students with skills to analyse the issues facing industries and companies through the use of specific business models using a case study. Students will be required to implement a strategy for the company, including any ethical implications.

BA1270
CLIENT PROJECT
This supervised project module will require students to respond to a situation or real problem of an industry partner. Students will work in teams on focal areas dependent on the client's needs and requirements. The project strives for a holistic integration of all the students' skills and understanding and develop their critical thinking and problem solving ability.

BA2011
INVESTMENT
Aims to equip students with a working knowledge of fundamental and technical analyses, and their applications in security analysis. More in-depth coverage of the stocks and features of capital market instruments will be taught, and students will have the opportunity to participate in an online stock trading game to reinforce their understanding of the dealing mechanics of stock trading, and to apply their knowledge of security analysis.

BA2021
PORTFOLIO MANAGEMENT
Introduces the procedures involved in portfolio management. Key topics include quantifying risk and return, analysing portfolio theories and evaluating portfolio performance.

BA2034
CORPORATE FINANCE
Focuses on basic tenets in financial management such as risk-return concepts, valuation models and strategic long-term investment and financing decisions. Capital budgeting techniques under certainty and risk, as well as special topics in financial decisions on dividend policies, economic value added (EVA), management performance indicators and mergers, etc. are included.

BA2045
FINANCIAL PLANNING
Introduces the students to the principles and current practices of personal financial planning. It provides an overview of risk management, insurance planning, tax planning, retirement planning, estate planning and credit management. The Financial Advisers Act that governs the practice of financial planners is also introduced.

BA2046
FINANCIAL MARKETS AND INSTITUTIONS
Covers the financial activities in various financial markets. Students get to learn the roles of financial institutions and the regulatory boards. Financial products and their market places such as primary and secondary trading in commodities, securities, money and foreign exchanges, capital and derivatives markets are discussed.

BA2048
INTERNATIONAL TRADE FINANCE AND DOCUMENTATION
Covers the functions and uses of trade documents, trade terms, the various methods of payments in trade, the risks faced by traders in international trade, and the different types of counter trade. In addition, students are taught the International Chamber of Commerce (ICC) 'Uniform Rules for Collection' and 'Uniform Customs and Practice for Documentary Credits'.

BA2050
WEALTH ADVISORY PROCESS AND RELATIONSHIP SKILLS
Aims to equip students with sales and relationship skills necessary in wealth advisory and management. Topics cover the client marketing process from a non-technical angle. These include pre-customer acquisition groundwork, after-sales service and relationship deepening.

BA2056
FINANCIAL MARKETS AND INSTITUTIONS
Introduces the features and activities in the financial markets of Singapore and the world. At the conclusion of this module, students will be able to understand the roles and operations of financial institutions and other key market players, appreciate the roles of regulatory bodies including the Central Bank (MAS) in the current trend of deregulation, competition and globalisation and understand the nature of activities instruments/products and services of various financial markets namely primary and secondary markets, money markets, capital markets and derivatives markets.

BA2063
FOREX TRADING
Covers the foreign exchange market which includes spot, forwards and swaps, the mechanics of dealing, and the factors influencing exchange rates. The money market will also be covered. Students will undergo simulated trading exercises to equip them with the practical skills of dealing.

BA2079
TECHNICAL ANALYSIS AND TRADING
Covers the study of price actions and technical indicators in analysing financial markets. It examines trend-following techniques as well as oscillators in forecasting market trends. Students will learn and apply technical analysis concepts, trading principles, marketing timing, trading psychology and guidelines on risk management. Students are prepared for the rigours of trading by completing a technical bourse game.

BA2080
CUSTOMER SERVICE EXPERIENCE
Aims to equip students with sales and relationship skills necessary in wealth advisory and management. Topics will cover the client marketing process from a non-technical angle. These include: the phase on pre-customer acquisition groundwork, after-sales service and relationship deepening. Design Thinking tools will be infused into the module to create customer-centric solutions.

BA2081
EQUITY AND FIXED INCOME ANALYSIS
Provides a working knowledge of the equity and bond markets and the key players. Major equity topics include dealing mechanics, fundamental analysis and common valuation models. The module also examines the investment characteristics of fixed income securities, bond price volatility and behaviour and basic bond portfolio strategies.

BA2082
FINANCIAL REGULATIONS AND COMPLIANCE
The module aims to familiarise students with the stockbroking industry and regulatory framework relating to securities trading in Singapore. Students will learn the rules and regulations governing securities trading, public listing, stockbroking operations, dealing ethics, money laundering, takeovers and corporate disclosure.

BA2083
TREASURY AND DERIVATIVES
Provides an overview of the foreign exchange market, money market, and other financial markets. Students will be introduced to the mechanics of trading in the various instruments in these markets and using these instruments for funding and investment. The module will also discuss the nature of futures markets, behaviour of futures prices and the mechanics of futures trading. Financial futures and options will be introduced as trading and hedging strategies. Students will have exposure to simulated forex and derivatives trading.

BA2084
FINAL YEAR PROJECT
Provides students an opportunity to integrate the banking and finance knowledge they have acquired from the course to work as a team to analyse issues, synthesize information and solve problems to provide customer-centric solutions.

BA2087
FINANCIAL MANAGEMENT
The module provides a basic understanding of the principles and practices of modern financial management. This module covers the financial management tools necessary to make better decisions based on financial data. This includes both short- and long-term financial management concepts and practices. Besides the important quantitative aspects, the module will bring an awareness of the need for businesses to operate ethically while seeking to maximise returns for their owners.

BA2105
ENTERPRISE INFORMATION SYSTEM
Introduces the theory and practice of systems analysis in the problem definition, requirements analysis and logical design phases of a systems project life cycle. It will enable the students to undertake the analysis of a given problem situation, to produce a definition of user requirements and to design an appropriate information system from the requirement specifications, using appropriate methods, tools and techniques. Students will have the opportunity to apply their learning through the Microsoft Dynamic practicum platform.

BA2107
BUSINESS ANALYTICS
This module aims to introduce the basic business analytics skills to students, allowing them to gain business insights through raw data and apply this skillset across different industries. Students will have an overview of the business analytics success pillars framework. They will be using Excel to identify patterns and trends, using Dashboards for analysis and presentation and applying Linear Regression to raw data to establish relationships.

BA2108
DATABASE MANAGEMENT
Aims to equip students with database knowledge which include characteristics of a relational model, functions of relational database management systems (RDBMS), process of normalisation, entity relationship modelling, database system development cycle, as well as practical skills in Structured Query Language (SQL).

BA2153
FINANCIAL MARKETS PRODUCTS
Introduces students to a wide array of financial instruments that are available in the financial markets. It covers fixed incomes instruments, securities, foreign exchange and derivatives products.

BA2203
PRINCIPLES OF NEW MEDIA MARKETING
This module aims to identify the important new media trends and to allow students to understand how companies are responding to the rapidly evolving digital world of user-generated contents, consumer communities and other new forms of communication such as social networking and tagging.

BA2208
INFOCOMM SECURITY
Provides students with an understanding of infocomm security concepts and issues. Students will be able to identify the risks, threats and vulnerabilities of the Internet, and learn how to defend against security breaches by identifying effective countermeasures to be taken against identified vulnerabilities. Students will also learn about ethical and responsibility issues through case studies of security breaches.

BA2211
ENTERPRISE RISK MANAGEMENT
The module will give students a basic grasp of risks faced by financial institutions and businesses as in the course of their operations. Selected risks will be analysed, including the ways in which these risks are generated, measured, and reported. The module will also describe some ways in which these risks can be managed or hedged.

BA2215
PREDICTIVE ANALYTICS I
This module aims to provide advanced business analytics concepts and techniques to perform data analysis for predicting outcomes based on past data. Students will use Macros, Visual Basics Applications to create predictive models and understand the assumptions underlying the predictive models. Students will also be taught data visualisation and apply them to create real-world solutions.

BA2217
PREDICTIVE ANALYTICS II
This module aims to provide students with hands on practice of up to date Analytics programs that are being used by the industry and higher institution of studies. Students will be creating models and identifying trends and patterns to form analysis strategies based on real-world problems. Students will be exposed mainly to R programming and Tableau.

BA2218
ESSENTIAL PROGRAMMING (PYTHON)
Starting with the basics of Python, students would progress to concepts like data manipulation. Additional focus will be placed on python libraries that enable data analytics. Students will also complete on an analytics project which they will manage with MS Visio.

BA2305
MOBILE MARKETING
Provides students with an overview of Mobile Marketing in the business world and to expose them to the business models, opportunities, issues and technology that are involved in the mobile marketing industry. The module will also familiarise students with tools for developing mobile applications.

BA2307
ENTERPRISE BUSINESS PROCESSES
Provides students with broad-based understanding of how basic business processes in the areas of accounting, materials management, procurement, production, sales and services are represented within an Enterprise Resource Planning (ERP) solution.

BA2311
BANKING OPERATIONAL RISK MANAGEMENT
Introduces students to the operational risks faced by a financial institution. Understand the key principles of an operational risk framework, key risk indicators, risk culture and appetite, the application of operational risk tools, data challenges and guidelines on regulatory reporting.

BA2312
INVESTMENT OPERATIONS
Introduces to students how foreign exchange, derivatives and securities are traded internationally. Students will be skilled in the processing of these trades from their inception to their final settlement. The monitoring and mitigation of credit and settlement risks will also be introduced.

BA2317
FINAL YEAR PROJECT
Provides students with an opportunity to integrate technical skills and business knowledge they have acquired from the course and experience problem solving, communicating and working as a team to develop a business proposal and solution for real clients. Basic principles of managing an analytics or IT project will also be taught. It will cover the planning, scheduling and development budget of the work, monitoring and control of projects from the perspective of project managers.

BA2318
UIUX WITH WEB APPS
This hands-on module allows students to study the design of user interfaces (UI), and craft engaging user experiences (UX). Students will build web-based applications; in the process, they will learn web technologies, apply design thinking skills, and Agile/ prototyping techniques.

BA3203
BUSINESS INNOVATION PROCESS (VISUALISATION, IDEATION AND PROTOTYPING)
Focuses on the idea generation and concept development of the business design process. Students will be introduced to a range of tools that will help them to innovate in a collaborative setting. At the end of the module, students will be able to independently execute a design project from conceptualisation to ideation by applying the design thinking methodology.

BA3204
FUNDAMENTALS OF DESIGN
Provides students an opportunity to appreciate art, design and ideas of the Art and Craft Modernism and Post Modernism Movements. These movements represent a series of events and developments that have very significant impact on how artists and designers have reconfigured and reinterpreted these movements to create new innovative designs.

Students will be tasked to apply the principles of design used in these movements to create branding and advertisements for their personalised businesses; which will aid them in understanding the basics of a good design and equip them with common language used among designers and the ability to think out of the box. Students will also be shown the workflow used by professional designers through the use of Adobe Design software to design and prototype artworks that reflect the application of the principles taught in class.

BA3205
EMOTIONAL INTELLIGENCE AND EMPATHY
Emotional Intelligence is increasingly relevant to organisational development and developing people. The module purports that in order to be successful, individuals require effective awareness, control and management of their own emotions, and those of other people. EQ embraces two aspects of intelligence, which is to understand yourself, your goals, intentions, responses and behaviour, plus the empathetic skills to understand others and their feelings.

The EQ principles provide a way to understand and assess people's behaviours, management styles, attitudes, interpersonal skills, and potential. In Business Innovation, EQ also plays a very important role in the successful design of products and services.

BA3206
BRANDING AND VISUAL COMMUNICATION
Introduces students to the theory and ideas of branding, as well as some of the more successful branding strategies that have been adopted by organisations worldwide which has helped them to seal their market positioning. This course is designed to help students understand and manage key elements of a strong brand strategy. It will provide the knowledge needed to design and implement both strategic and tactical integrated branding programmes that will increase the value of the organisation's brand and business.

BA3207
DESIGN THINKING PROCESS (FUNDAMENTALS OF DESIGN THINKING AND ETHNOGRAPHIC STUDIES)
This semester-long studio based module revolves around teaching the fundamentals of Design Thinking. The innovation process will cover deep consumer understanding, rapid prototyping of concepts that address a consumer need, and a strategy that makes the concept viable and sustainable. Students will be engaged in a real client-based project, with an emphasis on ethnographic research that will spearhead the development of meaningful innovation solutions.

BA3301
PROJECT MANAGEMENT
Provides students with an opportunity to integrate knowledge, design thinking framework and project management skills that they have acquired from the course. Students will apply analytical, design thinking, problem solving, project management, presentation and communication skills. Students will also learn how to use Microsoft Project to manage a project.

BA3303
INNOVATION MANAGEMENT
Provides students with an opportunity to recognise strategies that can enhance the successful implementation of business innovation. Leveraging on concepts like blue ocean innovation and value ecosystem, students will learn to construct a strategy that best suits the identified business innovation.

BA3304
STRATEGIC MANAGEMENT AND DESIGN
Aims to develop the students' understanding of the role and process of strategic management. Students will use various business tools to analyse the external environment, develop the organisation's vision, mission and objectives, and learn to craft and execute business strategy for sustainable, long-term growth and profitability.

BA3306
CHANGE MANAGEMENT
Provides students with insights to different change models and how they are suitable for different types of organisation change. It also examines the complexities, pitfalls and resistance experienced during change implementation, including the role of leadership in sustaining organisation change.

BA3307
BUSINESS MODEL DESIGN AND STRATEGY
Understanding the functional areas of a business and their relationships with one another while learning to use Business Strategy Tools such as Business Model Canvas, Value Proposition Canvas and Roger Martin's 'Playing to Win' strategy.

BA4111
BUSINESS STATISTICS
Provides students with an understanding of basic statistical concepts and their relevance to the business environment. Topics covered include descriptive statistics, simple probability, normal distribution, sampling, estimation, hypothesis testing, and linear regression and correlation.

BA4112
BASIC ECONOMICS
Enables students to understand basic microeconomics and macroeconomics concepts, and relate the concepts taught to real-world situations. Concepts will include demand and supply, the determination of prices, different market structures, the role of governments, economic indicators and international trade.

BA4113
MARKETING FUNDAMENTALS
Introduces students to basic marketing principles, including the strategic marketing management process, the marketing environment, understanding consumer behaviour, target market selection, and management of the marketing mix elements that include the 4P's: Product, Price, Place and Promotion.

BA4114
FUNDAMENTALS OF ACCOUNTING
Provides students with an understanding of fundamental accounting practices from the preparation of accounting records to the financial statements of a sole trader. Significant areas are the double entry concept, accounting process, special journals, subsidiary ledgers and control accounts, and the financial statements of service and merchandising businesses.

BA4115
ORGANISATIONAL BEHAVIOUR
Provides students with an understanding of human behaviour in organisations at the individual, group and corporate levels. Major topics include attitudes, personality, perception, group dynamics, motivation, leadership, communication and interpersonal skills.

BA4116
INTRODUCTION TO BUSINESS LAW
Provides students with an understanding of the basic features of the Singapore Legal System, and introduces to them the basic principles of contract law. Areas of law directly relevant to business, such as the law of tort and agency will be covered. The legal aspects of business organisations will also be emphasised.

BA4121
INTRODUCTION TO ELECTRONIC BUSINESS
Introduces students to the evolving field of e-business. Students will learn strategies including B2B, B2C and electronic marketing. An emphasis is placed on evaluating e-commerce sites in the areas of security, payment systems, design and usability. The module will also discuss the latest trends and developments in e-business.

BA4122
ESSENTIALS OF FINANCIAL AND MANAGEMENT ACCOUNTING
Provides students with an understanding of the fundamentals of financial and management accounting concepts for companies.

BA4123
NEW MEDIA MARKETING
Enables students to identify new media trends, how companies are responding to the evolving digital world of user-generated content, consumer communities and other new forms, such as social networking. Students also learn how companies utilise the new marketing planning framework to create new media marketing campaigns, using the right channels and measuring its effectiveness.

BA4124
ESSENTIALS OF CONSUMER PSYCHOLOGY
Provides students with an understanding of why and how individuals and groups engage in consumer activities and the cognitive processes and behaviour involved when people purchase and use products and services.

BA4125
ESSENTIALS OF CUSTOMER RELATIONSHIP MANAGEMENT
Enables students to understand Customer Relationship Management (CRM), and the key components that make up the CRM infrastructure. It covers the usefulness of Customer Life Time Value and RFM Analysis, how organisations plan for implementation of a CRM programme and the various customer touch-points in the practice of CRM.

BA4126
SERVICE QUALITY
Creates a 'mindset for service' among students and to equip them with the necessary customer service skills and knowledge in providing excellent service for future employment in service-related industries.

BA4131
PRINCIPLES OF MANAGEMENT
Provides students with an understanding of the basic management functions, namely, planning, organising and controlling. Other related topics such as corporate culture and environment, decision-making and management of change are also included.

BA4132
HUMAN RESOURCE MANAGEMENT
Provides students with an understanding of human resource management in an organisation. Key topics include human resource planning, recruitment and selection, training and development, performance appraisal, compensation, grievance procedures, and discipline approaches.

BA4133
FINANCIAL MANAGEMENT
Provides students with an understanding of basic accounting and financial concepts. In addition, students will be exposed to basic time value of money concepts and financial techniques used to analyse and evaluate capital investment projects.

BA4134
SUPPLY CHAIN MANAGEMENT
Provides students with the concepts and global perspectives of supply chain management (SCM), and its importance to businesses. It covers key supply chain processes, including distribution, sourcing, transportation, demand management,

inventory management, reverse logistics and supply chain outsourcing. The impact of information technology and E-business on SCM are discussed.

BA501B
ENTREPRENEURSHIP
Introduces students to the process of business ideas generation and gives them a basic understanding of marketing and finance fundamentals. Students are expected to integrate the knowledge learnt through their business projects.

BA5120
SERVICES MARKETING
Equips students with an understanding of the services management for different types of business sectors. Topics include formulation of marketing strategies, management of customer mix and planning, and implementation of marketing efforts in the distinctive areas of services marketing.

BA5121
GLOBAL MARKETING STRATEGY
Equips students with the knowledge of developing marketing strategies for international markets, and highlights the impact of international competitors in the domestic market. Topics include deciding which markets to enter, how firms enter international markets, international marketing programmes and implementation of international marketing programmes. Marketing to specific foreign countries will also be covered.

BA5123
BUYER BEHAVIOUR
Covers essential concepts of buying behaviour of individual consumers and institutional customers. Students will develop an understanding of consumer behaviour and its relationship to purchase decisions. Topics include consumers' decision-making, purchase processes and the basic factors which influence consumer behaviour. On institutional customers, areas covered are buying behaviour and industrial procurement and buyer-seller relationship.

BA5124
MARKETING MANAGEMENT
Gives a broad overview of the marketing discipline to provide both marketing and non-marketing personnel with a better perspective of the marketing function and the marketing management process. Topics covered include marketing fundamentals, market opportunity analysis, market segmentation and positioning, the elements of the marketing mix and marketing management in a contemporary context.

BA5130
SOCIAL MEDIA MARKETING
Exposes students, through hands-on application of social media marketing programmes, to the use of user-generated content, consumer communities and other emerging forms of non-traditional communication channels for marketing campaigns. Trends and developments in the social media landscape will be explored to ensure students gain a greater understanding of communication through social networking, tagging and other evolving media tools for effective marketing.

BA514Z
SELLING AND SALES MANAGEMENT
Introduces students to the principles of successful selling and effective sales management. Various methods of selling approach, presentation and closing techniques will be taught. Other topics include designing the sales organisation, sales forecasting, budgeting, management of sales territory, sales force compensation and appraisal systems.

BA518Z
MARKETING COMMUNICATIONS STRATEGY
Builds a sound theoretical and practical understanding of the formulation of promotional strategy and the management of the integrated marketing communication process. Strategic issues relating to advertising, public relations, personal selling and sales promotion will be covered.

BA5204
SUPPLY CHAIN MANAGEMENT
Introduces students to the contemporary concepts, principles and business practices in supply chain management. It will cover the principles underlying key supply chain processes, including distribution, sourcing, transportation, demand management, reverse logistics and outsourcing. The importance of using information technology to integrate and share information with internal and external parties across the supply chain will also be discussed.

BA6001
INTRODUCTION TO ACCOUNTING
Provides students with an understanding of the basic concepts and principles of accounting. Significant areas are double entry concept, the accounting process, financial statements of trading firms, basic costing concepts, cash flow statement appreciation, cost volume profit analysis and budgeting.

BA711M
ECONOMIC ANALYSIS
Provides students with a deeper knowledge of microeconomic and macroeconomic theories so as to draw out relevant applications to real-life economic events. Topics covered include game theory, economic growth models, and the impact of monetary and fiscal policies.

BA901Y/Z
FUNDAMENTALS OF ENTERPRISE DEVELOPMENT
Aims to equip students with fundamental business knowledge and skills and to develop the students' Design Thinking, problem-solving and communication skills. Students will use Design Thinking methodology to ideate, conduct user research, develop a prototype and write the marketing plan.

BA9014
BUSINESS MANAGEMENT FOR OPTOMETRY PRACTICE
Introduces students to business planning and retail operations. Students will apply the knowledge in an integrated manner to prepare a business project for an optometry practice. The module also provides an understanding of the legal and professional regulations governing the optometry practice in Singapore.

BA9017
TECHNOPRENEURSHIP
Provides students with the basic concepts of planning for a technology-based venture. It covers business ideas generation, marketing and finance. Students will apply this knowledge in an integrated manner to develop a simple business plan.

BA9019
INTRODUCTION TO BUSINESS MANAGEMENT
Aims to give students some general background and insight into the legal, financial and human aspects of commercial business. Business operations, partnerships and limited liability companies will be considered. Students will then learn about main financial documents, business indicators and sources of finance. Concepts of human aspects of industry will be presented with organisational structures and employment laws.

BA9023
PERSONAL SELLING
Provides students with a practical knowledge of the art and science of effective personal selling. It encompasses the learning of the comprehensive process of personal selling to consumers and businesses and putting into practice under realistic scenarios and assessments.

BA9024
PROFESSIONAL SELLING
At the end of the course, students will be able to: (a) Appreciate the important role of personal selling in an economy. (b) Apply with understanding the basic principles, various techniques and process of personal and relationship selling.

BE110Z
ARCHITECTURAL DESIGN STUDIO I
Facilitates the development of critical and design thinking, visualisation and documentation skills. Students are introduced to sketching, visual presentation and orthographic techniques and model-making in a design studio-based learning environment. They also learn to formulate architectural design ideas and development of aesthetics and 3D spatial awareness and appreciation through design primers and exercises. Students are tasked to apply considerations of anthropometry, environmental and functional concerns in the creation of a simple living habitat in a given context.

BE111Z
HISTORY & THEORY OF ARCHITECTURE I
Introduces principles of architectural thought, design and technologies through an overview of architectural development in early Western history and its parallel development in Asia. It provides students with a basic knowledge and understanding of architectural design language and thinking to facilitate their own generation of critical design strategies in their project work. Students are required to express their thought in writing and to articulate their interpretation of their own design ideas in their individual project work.

BE112Z
MATERIALS & ARCHITECTURAL TECHNOLOGY I
Provides students with the fundamental knowledge of building technology, and architectural detailing using basic building materials. Students explore and discover the design potential of these materials in response to structural and environmental forces. They learn to appreciate the concepts and behaviour of simple building structures and its components. Students are required to apply their knowledge through the understanding of basic structural principles and detailing of the architectural elements and finishes of their design project.

BE113Z
ENVIRONMENTAL SCIENCE I
Introduces the fundamentals of ecology and its impact on global warming and sustainability. It examines the potential of passive environmental approaches to minimise our dependence on artificial or mechanical means of achieving human comfort. Relevant codes of practice pertaining to drainage, daylighting and natural ventilation are referred to develop an appreciation for ecological design and its application to their design project.

BE115Z
ARCHITECTURAL VISUAL COMMUNICATION I
Provides students with the knowledge and skills to use 2D and 3D (modelling) software for architectural documentation and presentation. Students are introduced to CAD standards pertaining to architectural symbols, drawing conventions, line colour and layering systems. They are also exposed to digital presentation software to develop skills in visual composition. For their project, students have to apply their knowledge and skills to render, document and present their design.

BE120Z
ARCHITECTURAL DESIGN STUDIO II
Requires students to apply and integrate their knowledge and skills on a project from design formulation to design development in context and with reference to local code of practices. Through precedent studies, students learn to formulate design strategies with considerations for sociocultural influences in communal housing and modular prefabrication using precast concrete technology; document their design process in a journal and prepare documentation of drawings for the purpose of architectural design presentation, statutory submissions and detailing of a medium-rise residential development.

BE121Z
HISTORY & THEORY OF ARCHITECTURE II
Examines the philosophy and evolution of design language and architectural intention from the 19th century to the present in the West and its parallel development in Asia. It provides students with a basic knowledge and understanding of architectural design language and thinking to facilitate their own generation of critical design strategies in their project work. Students are required to express their thought in writing and to articulate the interpretation of their own ideas in their individual project work.

BE122Z
MATERIALS & ARCHITECTURAL TECHNOLOGY II
Teaches students about design buildability with reference to the concept of prefabrication using precast concrete technology and other natural and processed materials and architectural detailing for effective building and construction performance. Students also learn the fundamentals of various reinforced concrete structures and architectural elements, basement construction and lightweight metal architectural components. Students are required to apply their understanding of these systems in their project.

BE123Z
ENVIRONMENTAL SCIENCE II
Reinforces students' understanding of ecological design concepts with emphasis on building orientation, natural resources and waste management. Rainwater recycling/ harvesting and waste segregation disposal systems are examined. Students also learn the local codes and practices for domestic water supply, electrical substation and electrical supply, vertical transportation, drainage (sewerage, surface and roof for multiple storeys) and their impact and implications on spatial and façade design as well as site planning. Students also learn the fundamentals of public facilities and air-conditioning system used in residential buildings. Students are required to demonstrate their understanding of these systems in their project.

BE125Z
ARCHITECTURAL VISUAL COMMUNICATION II
Provides students with the fundamental and intermediate knowledge of Building Information Modelling (BIM) software, for architectural documentation and presentation. Students are introduced to ReVIT standards, including drawing and modelling conventions, families and quantity takeoff. They will continue to develop their tools and skills in documentation, rendering, visual and graphical composition and presentation.

BE130Z
ARCHITECTURAL DESIGN STUDIO III
Provides students with the knowledge for a comprehensive practice-oriented design process, with a synthesis of multiple competencies. Students experience the rigors of the design process from design conceptualisation to design development from macro to micro scales including documentation for statutory submissions. The emphasis will be on the exploration of technology in the conceptualisation and the development of the architectural expressions and detailing. Students are required to demonstrate their application and integration of multi-disciplinary knowledge to their project.

BE131Z
HISTORY & THEORY OF ARCHITECTURE III
Continues the examination of the philosophy and evolution of design language and architectural intention from the 19th century to the present in the West, but with greater emphasis on Asian and local developments. It advances students with an intermediate knowledge and understanding of social, cultural, economic and political issues in relation to architecture to facilitate their generation of critical design strategies in their project work. Students are required to express their thought in writing and to articulate the interpretation of their own ideas in their individual project work.

BE132Z
MATERIALS & ARCHITECTURAL TECHNOLOGY III
Provides students with the knowledge of building materials and construction technologies and detailing methods typically used in high-rise buildings. This includes steel-framed and composite construction, lightweight roof and façade cladding technologies. They are introduced to proprietary systems (such as false ceilings, dry wall partitions, sun shading devices). Students explore the impact of these materials and systems on the design and detailing of their project.

BE133Z
ENVIRONMENTAL SCIENCE III
Continues the study of environmental and resource management, and the integration of advanced building systems such as air-conditioning, mechanical ventilation, firefighting equipment and systems, and their impact on architecture and the environment. Students are required to demonstrate their understanding of these systems and a sustainable approach to environmental design in their project.

BE134Z
ARCHITECTURAL PRACTICE
Introduces students to the concepts of professionalism and ethics, marketing and branding, time and work management, and contract administration procedures that are relevant to architectural practice. The students will also learn the fundamentals of various quality systems relevant in the building industry.

BE2501
LAW I
Gives an appreciation of the nature, sources of law and the structure and hierarchy of courts in Singapore. It introduces Contract Law and its role in business and economic activity. Students will be given an appreciation of the application of the Law of Contract in the events industry.

BE2503
EVENT MATERIALS & DECORATION
Provides students with an understanding of the physical, functional and aesthetic properties of common materials for event decoration and finishes, and their uses in buildings and other supporting infrastructures which are related to the organising of events, conventions and exhibitions.

BE2504
IT APPLICATIONS FOR EVENTS I
Gives students an understanding of the types of application software that can be used in preparing promotional materials for events and projects. Students will learn the skills to make various types of promotional materials like brochures, posters, leaflets, flyers, web pages using common application software.

BE2506
EVENT EXPERIENCE
Aims to give students a realistic, meaningful, enjoyable and insightful experience of all the processes in the creation, planning, organising, management and carrying out of a simple event.

BE2509
AUDIO VISUAL SYSTEMS
Introduces students to the principles of light and sound. Students will be given an understanding of the effects that light and sound have on the environment. They will learn how to design, experiment, select and implement light and sound systems for different events.

BE2510
ECONOMICS
Gives students an understanding of basic microeconomic and macroeconomic concepts. Students will understand the principles of production, distribution and consumption of products and services through topics such as resource allocation, demand and supply, price determination, production equilibrium, market structure, national income, macro equilibrium and objectives, money, monetary and fiscal policies and international trade.

BE2511
PRINCIPLES OF MARKETING
Gives students an understanding of the role of marketing in the events industry. Students will learn the concepts and process of marketing, market segmentation and positioning, marketing strategies, key elements of a marketing plan, importance of branding and concepts of corporate identity.

BE2512
DESIGN, DRAWINGS & CADD
Gives students the ability to interpret and comprehend event facilities construction drawings and details. Students will learn to produce scale drawings manually as well as using proprietary application software. Students will also be given an appreciation of design, the importance of design, design process, elements and principles of design.

BE2513
PRINCIPLES OF MANAGEMENT
Provides students with an understanding of the principles of management. Students will be introduced to the process of management, decision-making, organisational behaviour and culture, organisational structure and design, leadership and motivation theories, group dynamics, communication and interpersonal skills.

BE2514
FOOD & BEVERAGES
Gives students an understanding of the provision of appropriate food and beverages for events and their licensing requirements. Students will also be given an appreciation of food purchasing, preparation, storage, service, catering, food safety and waste management.

BE2515
EVENT CREATION & MARKET RESEARCH
Gives students an understanding of event conceptualisation and creation of special events through the understanding of markets and market research, event studies, events and public policy, event proposal and bids, as well as sponsorship. Students will be given a heads up on trends impacting the event industry.

BE260Y/Z
INTEGRATED PROJECT
Aims to develop initiative, self-reliance and organisational abilities by making students work independently in an authentic work situation. It draws upon the various aspects of the course content and requires students to integrate their learning through initiation, planning, implementation, execution and shut-down of an event. Students will be working in groups and guided by a project supervisor.

BE2601
LOGISTICS & SITE OPERATIONS
Gives students an understanding of the basic requirements for logistics and operations for events. Students will learn the logistics requirements for the supply of event customers, products and facilities for event/site logistics, operation, maintenance and shutdown including ticketing, queuing, transportation, accommodation, infrastructure facilities, car parking, communication, cleaning and waste management, risk management, etc.

BE2602
ACCOUNTS & FINANCE
Gives students an understanding of the basic concepts and principles of accounting. Types of business organisations, preparation and interpretation of balance sheet and profit and loss statement, basic financial ratio analysis, sources of finance, cash flow analysis and budget and variance will also be taught.

BE2605
IT APPLICATIONS FOR EVENTS II
Equips students with skillsets in using computer applications for storing, organising and manipulating data as well as project planning.

BE2607
LAW II
Provides students with an understanding of the general principles of the Laws of Tort and Agency and their application in events, businesses and economic activities.

BE2612
EVENT FACILITIES CONSTRUCTION
Gives students an understanding of the construction of common types of event structures and facilities suitable for indoor and outdoor events. Topics covered include fencing and barricades, scaffolding, tentages and stage, signage, backdrop and props, grandstands, event cubicles and partitions, etc.

BE2613
PROJECT MANAGEMENT
Provides an introduction to project management as an approach to event operations. In particular, it covers all stages of event management including initiation, planning, implementation, staging the event and completing the event. It also covers the preparation of an event brief, selection and appointment of event vendors and contractors, understanding stakeholders' requirements, event evaluation and reporting and crisis management.

BE2614
ENVIRONMENTAL SAFETY & HEALTH
Gives students an appreciation of environmental safety and health issues in the events industry including accident prevention, risk assessment and management, general safety measures, health and hygiene issues, electrical, mechanical and fire hazards, energy conservation, safety audit, waste management, etc.

BE2616
PUBLIC RELATIONS
Gives students an understanding of the role and value of public relations in the context of the events industry. Students will learn the functions, planning process, techniques and tools of public relations.

BE2617
MICE MANAGEMENT
Gives students an understanding of the principles and practices of the MICE industry. Topics covered include fundamentals of organising business meetings and seminars, incentive travel programmes, conventions, exhibition and trade shows.

BE2707
EVENT BUDGETING & CONTROL
Enables students to understand the various cost areas in a budget for an event, practical means of controlling cash flow for an event and the management of revenues including event sponsorships.

BE2711
ENTREPRENEURSHIP
Aims to give students an entrepreneurial mindset. It requires students to find a niche in the event industry, develop and evaluate their business ideas, recognise business opportunities and learn through simulation how to start and manage an event-related business venture.

BE2714
CROSS-CULTURAL STUDIES
Gives students an understanding of the globalisation of business and the impact of culture on operating and managing business in a multi-cultural market and workplace. Students will be given an appreciation of culture generally and an understanding of cultural differences among people, methods of dealing with the differences and cross-cultural communication.

BE2716
VENUE & FACILITIES MANAGEMENT
Gives students an understanding of traditional and non-traditional venues, venue evaluation and selection, space management of event venues, management, maintenance and operation of venues and security management. Students will also learn the essentials of managing event facilities such as electrical, mechanical ventilation and air-conditioning system, fire protection and communication, plumbing and sanitary installations in events.

BE2717
EVENT TOURISM & LEISURE
Gives students an understanding of the role of events in the travel and tourism industry. Students will also learn the importance of events in destination marketing and management.

BE2718
RESOURCE PROCUREMENT & NEGOTIATION
Gives students an understanding of tendering procedures, tender documents to procure work, materials, goods and services, legal issues governing events and the labour resource for events and human resource management for event staff and volunteers. Students will also learn the principles of negotiation, the skills of effective negotiation, the negotiation process and the preparation and execution of negotiation strategies/tactics.

BE510Z
LANDSCAPE DESIGN STUDIO I
Provides students with the fundamental knowledge and design thinking skills in visualisation and communication for landscape design. The module will introduce students to the landscape design presentation techniques both 2D and 3D drawings, models and basic digital presentation. Students also learn to apply and integrate concepts and fundamentals of landscape design, technology and ecology in small-scale projects.

BE511Z
PLANTS & LANDSCAPE TECHNOLOGY
Develops in students the sensitivities of space making and visualisation in using plant materials from the tropics. It also develops students' understanding of the basic botanical science concerning plants' character of growth, planting, maintenance and basic propagation techniques. Students also learn the basics of construction involved in landscaping structures and works.

BE512Z
HISTORY & THEORY OF LANDSCAPE DESIGN I
Develops students' understanding of design principles, appreciation towards human physical and mental responses to the natural environment. It introduces the historical, socio-cultural background and theories of landscape architecture in South East Asia and Asia with emphasis from vernacular to the modern adaptation.

BE513Z
ENVIRONMENTAL SYSTEMS & PROCESSES
Introduces students to the role of environmental processes in shaping the patterns of the physical environment and the operation of global environment systems. There will be fundamental knowledge on the need for sustainable interactions of humans with their environment and for control of environmental crisis such as global warming and depletion of natural resources.

BE520Z
LANDSCAPE DESIGN STUDIO II
Facilitates students to explore and discover solutions appropriate for vertical garden and green façade designs as well as site planning for residential and community based projects. In the design process, students further develop skills to resolve and integrate a complexity of multidisciplinary information and constraints.

BE5200
PROJECT MANAGEMENT IN LANDSCAPE ARCHITECTURE I
Introduces the principles of quality management in a design office as well as the fundamentals of project management for a landscaping project including cost estimation, specifications and contracts administration.

BE521Z
PLANTS & SKY-RISE TECHNOLOGY
Develops in students a good understanding on the importance of integration between landscape and architecture. Students also develop an appreciation of sky-rise technology with landscape consideration. There is an emphasis on the construction of roof garden system with use of appropriate planting and hardscape materials and considerations for drainage. Students will also be introduced to the basic concept of water management, lighting and relevant local codes.

BE522Z
HISTORY & THEORY OF LANDSCAPE DESIGN II
Develops students' appreciation for the adaptive use of art elements and methodologies in formal landscape planning associated with the Western landscape architecture from renaissance to the present day adaptation.

BE523Z
COMPUTER-AIDED DESIGN & PRESENTATION
Provides students with the knowledge to use software and digital techniques for design, presentation and documentation of landscape design. This is complementary to study models and other media of communications.

BE530Z
LANDSCAPE DESIGN STUDIO III
Enables students to experience the design process of urban open space planning and landform designs with considerations to local authority's policies and design guidelines. It involves further development of critical thinking and problem-solving skills to strategise and make decisions. It facilitates students' developing skills in the integration of natural with built forms in the creation of an urban landscape. It is a holistic approach to create a relationship for sustainable development.

BE5300
PLANTS & SITE PLANNING
Develops in students the knowledge of site inventory, and their impact to site planning and design of an urban site. It also develops students' knowledge in plant selection and planting design for public spaces and their aspects of urban biodiversity and management.

BE5301
URBAN ENVIRONMENT & SOCIETY
Examines the social and economic sustainability issues and techniques for good urban spaces and landscapes design with emphasis to local context. The political and economic landscapes are studied to understand the impact and implications on the lifestyles and well-being of the people in Singapore.

BE5304
PROJECT MANAGEMENT IN LANDSCAPE ARCHITECTURE II
Introduces the documentation and preparation for a landscaping project including cost estimation, specifications and contracts administration. It also emphasises on developing effective portfolio at showcasing students' skills in landscape and related field.

BE6701
INTRODUCTION TO FACILITIES MANAGEMENT
Provides students with an understanding of the operation of the diverse and dynamic facilities management industry. It covers the scope of work under the facilities manager's purview, job role of the facilities manager in different types of assets, namely commercial (retail, offices), industrial, business parks, infrastructural (airports, trains, cruise liners), institutional (teaching institutions, hospitals), recreational (hotels, resorts, country clubs, theme parks, attractions) and residential (public and private housing), the key players, stakeholders and regulatory bodies in this industry and their inter-relationships.

BE6702
BUILDING SERVICES 1
Equips students with the knowledge of mechanical and electrical engineering systems including water supply, sanitary plumbing and drainage, gas installation, refuse disposal, electrical distribution, lightning protection and telecommunication.

BE6703
STRUCTURE & FABRIC
Gives students an understanding of elementary building construction, renovation and refurbishment of low-rise buildings, including the materials, the structural elements, the architectural components and finishes. Students will learn the different forms of building construction with the use of drawings and apply this understanding to construction, renovation and refurbishment work to buildings.

BE6704
PRINCIPLES OF MANAGEMENT
Provides students with an understanding of the principles of management. Students will be introduced to the process of management, decision-making, organisational behaviour and culture, organisational structure and design, leadership and motivation theories, group dynamics, communication and interpersonal skills.

BE6705
FACILITIES SERVICES MANAGEMENT 1
Provides an overview of efficient soft services in facilities management for a more productive and hospitable environment across commercial, industrial, business parks, infrastructural, institutional, recreational and residential (public and private housing) facilities. These services can be provided individually or as part of an integrated solution. Gives students an understanding of front of house services such as concierge, reception and portering. Students will learn basic skills and understand the importance of service quality in the facilities management industry. This module will also cover back of house services such as security management, fleet and carpark management.

BE6706
LAW
Gives an appreciation of the nature and sources of law as well as the structure and hierarchy of courts in Singapore. It introduces Law of Contract and Torts and their roles in business and economic activity.

BE6707
EVENT & VENUE MANAGEMENT
Provides an introduction to event management. In particular, it will cover all the stages of event management including initiation, planning, implementation, staging and completing the event. Gives an understanding of the principles of selecting and managing venues and facilities space. It focuses on how the space and facilities in venues are evaluated, planned, managed, operated and maintained.

BE6708
ECONOMICS
Gives students an understanding of basic microeconomic and macroeconomic concepts. Coverage includes resource allocation, demand and supply, price determination, production equilibrium, market structure, national income, macro equilibrium and objectives, money, monetary and fiscal policies and international trade.

BE6709
LEISURE AMENITIES MANAGEMENT
Gives students an understanding of leisure facilities and other amenities and their maintenance and management. It covers leisure facilities such as external works, clubhouses, gyms, swimming pools, spas, jacuzzi, saunas, steam rooms, games rooms, tennis and squash courts, business centre, playgrounds and landscaping gardens.

BE6801
ACCOUNTS & FINANCE
Gives students an understanding of the basic concepts and principles of accounting. Types of business organisations, preparation and interpretation of balance sheet and profit and loss statement, basic financial ratio analysis, sources of finance, cash flow analysis, and budget and variance will also be taught.

BE6802
BUILDING SERVICES 2
Equips students with the knowledge of mechanical and electrical engineering systems including lighting, ventilation, air conditioning, lifts and escalators.

BE6803
ENVIRONMENTAL MANAGEMENT & SUSTAINABILITY
Describes sustainability and its role in the overall business strategy of an organisation. This module covers utilities management, energy savings initiatives and techniques, building automation, developing sustainable buildings, green building technologies, waste control and reduction.

BE6804
FACILITIES MANAGEMENT & COMMUNICATIONS
Gives students an understanding of the importance of property & facilities maintenance management in the overall success of an organisation and its business. The various aspects of property & facilities maintenance management including planning, organisation and execution of maintenance work, keeping records and documentation, life cycle costing, estimating and budgeting, tenancy management, project and improvement work, maintenance and operation, etc., and legislations governing maintenance of properties in Singapore will be covered. Provides students with an understanding of how to write proper agendas, minutes of meetings, circulars and technical reports in facilities management.

BE6805
MARKETING & PUBLIC RELATIONS
Gives students an understanding of the role of marketing and Public Relations (PR) in the industry. Students will learn the functions, planning process, techniques and tools of integrated marketing communications. Students will also learn the context, functions, media relations, traditional and new media, and tools of PR to achieve maximum coverage.

BE6806
BUILDING DEFECTS DIAGNOSIS & RECTIFICATION
Gives students an understanding of the factors leading to building deterioration and defects. It also enables students to identify common building defects, diagnose their cases and understand their respective preventive and remedial measures.

BE6807
TOWN COUNCIL & STRATA MANAGEMENT
Gives students an understanding of the applicable legislations governing the management and maintenance of public housing estates in Town Council and private strata titled properties consisting of residential, office, retail, industrial and mixed development.

BE6808
CUSTOMER RELATIONSHIP MANAGEMENT
Gives students the basic skills and understanding necessary for effective customer service. Students will learn the four components of Customer Relation Management viz. information, process, technology and people.

BE6809
IT for FM
Gives students the ability to draft and present drawings using proprietary application software to interpret and comprehend construction drawings and details. Students are introduced to Computer Aided Design (CAD) standards and drafting. Provides students an understanding of Building Information Modelling (BIM) and how BIM can be integrated with Building Management Systems to optimize construction drawings and information input by architects, structural engineers and mechanical & electrical engineers. Gives students the ability to utilise the tools available for integrating both logical and graphical BIM data, and to maximise the potential of BIM to support lifecycle space and asset management.

BE6810
FIRE SAFETY MANAGEMENT
Prepares students for the duties of a Fire Safety Manager. It covers the similar contents of the Fire Safety Manager Course offered by the SCDF. The principles of fire and fire safety design and management will be covered.

BE6811
FACILITIES SERVICES MANAGEMENT 2
Provides an overview of efficient soft services in facilities management for a more productive and hospitable environment across commercial, industrial, business parks, infrastructural, institutional, recreational and residential (public and private housing) facilities. These services can be provided individually or as part of an integrated solution. Gives students an understanding of catering services such as food solutions and management of food hygiene. Students will learn basic skills and understand the importance of service quality in facilities management industry. This module also encompasses housekeeping services, pest control and waste management.

BE6901
CROSS CULTURAL STUDIES FOR BUSINESS
Gives students an understanding of the globalisation of business and the impact of culture on operating and managing business in a multicultural market and workplace. Students will be given an appreciation of culture generally and an understanding of cultural differences among people, methods of dealing with the differences and cross-cultural communication in the business environment.

BE6902
FINAL SEMESTER INTEGRATED PROJECT
Aims to develop initiative, self-reliance and organisational abilities by making students work independently in an authentic work situation. It consists of an in-depth study of real issues or topics related to actual practice in property & facilities management. It draws upon the various aspects of the course content and may require thorough literature research and fieldwork, and writing a report, model making or video production or writing an application software. An element of creativity, innovation and enterprise (CIE) is also required. Students will be working in groups and guided by a project supervisor.

BE6903
MAINTENANCE OF BUILDING SERVICES
Provides students with an appreciation for the operation and maintenance of mechanical and electrical systems of buildings.

BE6904
PROCUREMENT & PROJECT MANAGEMENT
Gives students an understanding of the procurement and contract administration process in facilities management, covering outsourcing models, procurement methods, types of contract, service level agreement, tendering process, specification, tender documents, evaluation of tenders and tenderers including monitoring and managing performance of contracts. It also provides an understanding of project management in the context of facilities management and covers all phases of project management.

BE6905
REFURBISHMENT & ASSET ENHANCEMENT INITIATIVES
Gives students an understanding of the material and methods employed in sustainable refurbishment, retrofitting and A&A including the associated temporary works like scaffolding, hoardings, temporary support systems, underpinning, etc. It also covers the safety considerations while refurbishment is in progress. Provides an overview and appreciation of the key features of Smart buildings within the context of facilities management. It covers building and facility systems, communications, business systems, technology solutions, such as digitization, remote access, voice activated controls, mobile applications and the Internet of Things that contribute to sustainability and operational efficiency. Understanding of the functioning of these systems and devices, and the ability to capitalise on them as facilities managers will also be covered.

BE6906
SAFETY, HEALTH & SECURITY
Gives students an understanding of safety, health and welfare of workmen when carrying out renovation, refurbishment and facilities management work. It helps students acquire knowledge and supervisory skills for good housekeeping, risk management and maintenance of safe working environments, as well as an understanding of the procedures under the Workplace Safety and Health Act and other related legislation. The installation and operation of modern building security systems, management, planning and deployment of security personnel for the safety of occupants will also be covered.

BE8101
GEOMATICS 1 & GIS
Aims to introduce the principles involved in the practice of spatial data acquisition, processing and presentation of these surveyed data digitally. Students will learn the basic concepts of principles of point location, determination of heights by levelling, collimation error determination and the establishment of reference marks by traversing. They will also learn the basic functions of ArcGIS software to plot the surveyed data and the conversion of topographic data of the SP campus into a GIS database.

BE8103
ECONOMICS
Gives students an understanding of basic microeconomic and macroeconomic concepts. Topics covered include basic concepts of economics, demand and supply, market equilibrium, elasticity, production and costs, market structure, perfect competition, monopoly, national income and money.

BE8104
STRUCTURAL MECHANICS
Aims to cover the fundamentals of statics and strengths of materials. Students learn to solve problems involving the analysis of statically determinate beams, frame structures and the calculations of stresses and strains. Topics covered include equilibrium of forces, pin-jointed frames, shear forces and bending moments, sectional properties, direct stresses and strains as well as column buckling.

BE8109
HYDROLOGY & HYDRAULICS
Provides the basic knowledge of hydrology, hydrostatics, hydrodynamics and their applications in practice. Students will learn about properties of fluids and calculate forces exerted on plane surfaces by stationary fluid. They will learn to calculate flow measurement through pipes and open channels by using the venturimeter, and orifices. Students will also learn to design pipelines and open channels to convey stormwater. Classroom teaching is reinforced with tutorials in small groups and practical sessions in the laboratory.

BE811Z
INTRODUCTION TO CIVIL ENGINEERING & BUILDING
This module introduces students to civil engineering and building. It is a Year 1 capstone module in which students learn to apply basic sciences and mathematics for simple civil engineering and building projects. The module follows the project cycle of conceive, design, implement and operate (CDIO). Students will learn to take personal responsibility in learning the entire process of implementing a project. They will work on a challenge-based learning project using timber strips to build a simple structural model so as to acquire interpersonal and technical skills and work attitudes. Challenge-based learning provides an authentic learning process that challenges students to make a difference.

BE812Z
CAD WITH BUILDING INFORMATION MODELLING (BIM)
Aims to give students some general background and insights into building construction stages, steps and information flow in Civil Engineering building and structure modelling and to equip students with fundamental CAD and Building Information Modelling (BIM) skills. It attempts to use computer hands-on practical session and project-based learning to achieve these goals. Students will learn visualisation skill, latest CAD and BIM technologies, and will be facilitated with learning environment that encourages independent learning. Students will apply these knowledge and skills in an integrated manner to develop a virtual construction simulation model of 3D building and civil engineering structures. This module also serves as a foundation for other CAD and BIM application environment in Year 2 and Year 3 of this course.

BE8201
REINFORCED CONCRETE DESIGN & CAD
Provides students with an understanding of reinforced concrete design according to Eurocode 2. It covers the design of basic structural elements of a building such as beams, slabs, columns and footings. The students will learn to use CAD software to detail the reinforcement bars as calculated from their design.

BE8202
STRUCTURAL ANALYSIS
Provides the basic knowledge of analysis for determinate and indeterminate structures. Students will learn to analyse structures by using the classical methods such as principles of virtual works and moment distribution method. The theoretical analysis is supplemented by computer application of available structural analysis software and laboratory simulation sessions, which are tailored to give a better understanding of the structural theory.

BE8205
SAFETY, HEALTH & ENVIRONMENTAL MANAGEMENT
Provides students with an understanding of the safety, health and environmental hazards inherent in the construction industry and the preventive measures to ensure safe and healthy work environment. It helps students acquire knowledge and supervisory skills for good housekeeping, risk management and maintenance of safe working environment and understand procedures under the Workplace Safety and Health Act and other related legislation. It also introduces environmental control concepts at construction sites such as solid waste management, vector control, food hygiene, water, air and noise pollution control.

BE8206
GEOTECHNICAL ENGINEERING
Provides students with the fundamentals of soil mechanics. Topics include soil classification, ground investigation, basic properties, compaction, permeability, stresses in soil, shear strength and the design of retaining walls and footings to Eurocode 7. Classroom instructions are supplemented by tutorials, laboratory sessions, assignment on slope model testing and e-learning.

BE8207
CIVIL ENGINEERING CONSTRUCTION & MEASUREMENT
Provides students with the principles and methods of piling, basement excavation and geotechnical instrumentations and concrete practice. Students will also be taught the basic principles of measurements in earthwork, in situ concrete and concrete ancillaries and pipeworks. A project-based assignment and tutorial exercises are given to enhance the understanding of concepts taught in the classrooms.

BE8209
GEOMATICS 2 & GPS
In this module, students will apply what they have learnt in Geomatics I and GIS to civil engineering applications. The field exercises include longitudinal / cross-sections levelling, setting-out surveys, topographical surveys and GPS surveys. Students will use various surveying instruments such as Total Stations, Automatic / Digital Levels and Global Positioning System (GPS) Receivers during their practical fieldwork. They will also use Computer Aided Design (CAD) software to plot the surveyed data. In addition, the module introduces the students to hydrographic surveying.

BE8212
WATER TECHNOLOGY
Provides students with an overview of water resource and water pollution control practice. Fundamental principle and current engineering practice in water treatment and distribution, wastewater collection and treatment, sludge treatment and disposal, and water reclamation will be taught in the module. Lab works for water and wastewater analysis will also be conducted. Upon completion of the module, students should be able to have some background knowledge to carry out simple design and operation of water treatment and reclamation system.

BE8300
GREEN BUILDING TECHNOLOGY
Equips students with the knowledge of green building systems, selection of green building materials, economic analysis of green buildings and the various Green Building Technologies to achieve a sustainable built environment. Project work, case studies and site visits to buildings with green mark awards are aimed to enhance further understanding of green building concepts taught.

BE8301
ABC WATERS DESIGN
Covers the planning, design and performance of 'Active, Beautiful, Clean' (ABC) water design features, safety considerations, public health and maintenance of the systems. Students will learn how these principles act together to achieve a sustainable environment. Real-life case studies and site visits around Singapore will be included to allow students to have a better visualisation of the design and engineering principles. Launched in 2006, PUB's Active, Beautiful, Clean Waters (ABC Waters) programme aims to integrate Singapore's parks, reservoirs and waterways, recreational infrastructures and facilities.

BE8306
CIVIL ENGINEERING PROJECT MANAGEMENT
Provides students with the knowledge on principles of project management and their applications in construction projects. Techniques in managing construction projects will be taught including project planning, project procurement, engineering economics, cash flow analysis, gantt chart, and critical path methods using network diagrams. Students will explore the use of computer software in project management to manage projects.

BE8307
STEEL DESIGN & CAD
Covers the basic concepts and principles of structural steel design and detailing to Eurocode 3. Students will be taught the design of structural members such as tension and compression members, column bases, and the design of simple connections in bolted or welded construction. Students will learn to design and sketch structural steelwork drawings with emphasis placed on standard detailing practice. They will also learn to appreciate the use of Steel CAD software to produce these drawings. Classroom teaching is supplemented with individual assignments, group work and presentations and site visits.

BE831Z
FINAL YEAR PROJECT
Allows students to apply concepts learnt in the various civil engineering modules and provide solutions to problems. Final year students will work in small groups which will foster team work. The project may be industrial-based or research-based and will be guided by academic staff. The project group will be required to submit a formal written report and may also be required to do an oral presentation.

BE8310
COMPUTER PROGRAMMING WITH APPLICATIONS IN CIVIL ENGINEERING
Provides students with basic knowledge, hands-on practice, practical skills and techniques of computer programming as well as its application in solving civil engineering problems. It covers customisation of commonly used software in civil structural engineering such as Microsoft Excel to automate the repetitive tasks involved and add 'intelligent' behaviour to their existing functionalities and therefore leads to increased productivity.

BE8313
TRANSPORTATION ENGINEERING
Equips students with basic knowledge of transportation engineering. The module focuses on urban highway engineering and covers various topics ranging from planning to design and construction. Students will learn to analyse traffic demand, acquire and interpret traffic flow data, perform geometric design of highways, and carry out design of flexible pavements. Instruction will take place through a combination of lectures, tutorials and laboratory (practical) sessions.

BE8314
CIVIL ENGINEERING TECHNOLOGY
Covers the selection of suitable construction plants and the planning of civil engineering works such as earthworks, roadworks, bridges, tunnels, dredging and land reclamation. These include most aspects of advanced construction with an insight into techniques applied in large-scale development using standard or specialised machineries and equipment. Also taught is the adoption of game-changing technologies like Prefabricated Pre-finished Volumetric Construction (PPVC) and Cross Laminated Timber (CLT) construction technique. Classroom instructions are supplemented with tutorials, problem-based assignments and presentations.

BE8315
STRUCTURAL BIM E-SUBMISSION
Supports the learning objectives of the Conceive-Design-Implement-Operate (CDIO) initiative and attempts to use the computer technologies and project-based learning to achieve these goals. It allows students to acquire knowledge on the design of a complete structure and the associated ancillary civil engineering works and gives them practice on how to extract relevant information from Architectural Drawings for Structural and Civil Engineering Design. It also aims to expose them to the submission procedures using BIM as required by the relevant authorities.

BE8316
ENTREPRENEURSHIP
Introduces students to techniques designed to grow an economic enterprise in construction industry. Such techniques include assessments of marketing opportunities, intelligence gathering on customers and competitors, generating sales, follow-up sales activity, business plan writing and business model design. The student will learn to develop business opportunities through value chain of construction project life cycle. The business development involves evaluating a business and then realising its full potential, networking and teamwork, using such tools as marketing, sales, information and financial management, and customer service.

BE8317
STRUCTURAL INSPECTION & REPAIR
Provides students with the knowledge of concrete deterioration, hands-on practice of non-destructive testing techniques and methods of concrete repair. Students will be taught the causes of defects in reinforced concrete. They will also be given hands-on practical skills on non-destructive testing techniques such as the rebound hammer test, ultrasonic pulse velocity test, penetration resistance test, core test, half-cell potential test etc. Students will also learn various methods of concrete repair and strengthening such as patch repair, jacketing, sprayed concrete and fibre wrap.

BE8319
ACCOUNTS & FINANCE
This module equips students with basic knowledge and understanding of the fundamental principles of accounting and finance. Students will also learn about the different types of organisations and their possible sources of finance; the various classifications of costs and behaviour; cost allocation used in planning/budgeting process and the time value of money. Students will also be taught to read financial statements, as well as perform qualitative analysis and quantitative/ financial analysis for a holistic appreciation of the performance of an organisation through a range of in-course activities and a mini project.

BE8320
PRECAST & PRE-STRESSED CONCRETE TECHNOLOGY
Equips students with the understanding to design and implement a building project using the precast concrete technology through BIM collaboration and innovation. This technology has been identified as one of the key areas of focus that contribute to faster and less labour intensive construction through the ease of manufacture (off-site) and efficiency of assembly (on-site). This would eventually lead to improved productivity in the construction industry. The next part of the module deals with developments and challenges in pre-stressed, precast concrete technology. This will include the basic understanding of pre-stressed precast concrete technology, the design concepts, post-tensioning applications in buildings and pre-stressed precast applications in bridges and viaduct construction.

BE8321
SOLID WASTE MANAGEMENT
The module teaches the basic concepts on solid waste management including the type and characteristic of solid waste, solid waste handling, separation, collection, disposal and waste minimisation. In addition, students will learn BCA and NEA requirements on solid waste management at construction sites. Classroom teaching will be supplemented by mini projects, case studies and a site visit.

BE9001
DETAILING FOR SUSTAINABLE DESIGN IN ARCHITECTURE & LANDSCAPE
Students will utilise design principles of passive design strategies involved in sustainable design for the tropics, to further examine the deep effects of materials selection, sustainable technologies and systems have on buildability.

BE9004
ADVANCED DIGITAL PRESENTATION
Endeavours to cultivate a culture of critical questioning and analysing in students while improving their skill in using digital tools to enhance clarity in presentation. Students will examine the principles and strategies of digital presentation in design projects.

BE9005
ARCHITECTURE APPRECIATION
Introduces architecture through case studies and project visits. This is to enlighten and illustrate to students that architecture involves the process and the product of planning, designing, and constructing buildings and other physical structures given the context and the requirement stipulated. Eventually students should be very familiar and able to understand the structural skeleton, construction principles, materials and spatial qualities given a piece of architecture. The major assignment will involve the selection of a piece of architecture and analysing it through modelling, graphic presentation and verbal expression in terms of its design philosophy/concept, structural element and rationale, materials and spaces.

BE9301/9302/9303
VERTICAL STUDIO ELECTIVES
Electives offered are refreshed yearly. Students across all three years can expect to choose from a range of options to enhance and deepen their skill sets, or be introduced to new and cutting-edge ideas during a workshop based 2-week elective. They can expect to have intense interaction and work closely with both full-time staff and/or specialist adjuncts brought in to engage their tutees. Topics may include 3D prototyping, parametric design, advance materiality and detailing, art, craft and techne and sustainability.

CP0304
LABORATORY MANAGEMENT AND BIOSAFETY
Provides an overview of quality management for the laboratory and accreditation. The practice of safe science in clinical and life science laboratories is also covered.

CP0401
HAIR-CARE RAW MATERIALS AND FORMULATIONS
Provides an understanding of the ingredients used in formulating hair products, their purpose and formulating techniques. The topics for this module cover a detailed study of surfactants, thickeners, actives, preservatives and other ingredients in hair.

CP0402
PERFUMERY
Provides an overview of the history of the perfume industry and its process of development from conceptualisation to market launch. Raw materials, formulation techniques for creating and matching fragrances as well as fragrance applications with emphasis on recent updates and ongoing research are covered.

CP0403
DERMAL PHARMACOLOGY AND COSMETIC REGULATIONS
Provides an overview of the physiology and histology of the skin, hypersensitivity and immunological skin reactions, common skin disorders and their treatment. Toxicological, phototoxicity and photosensitivity effects from cosmetic ingredients will be included. Local and international cosmetic regulations, banned substances in cosmetics formulations, labelling and licensing requirements for cosmetic products are covered.

CP0404
SKINCARE RAW MATERIALS AND FORMULATIONS
Provides an overview of ingredients used in skincare products. Formulations, preparations and evaluations will be covered across main areas in personal care from anti-ageing creams to coloured lipsticks and sunscreens. Different preparation, testing and evaluation methods as well as safety and stability studies will be included. Updates of new technologies and raw materials used in microemulsions, liposomes, skin lightening and skin delivery systems are discussed.

CP0405
COLLOID AND POLYMER SCIENCE
Provides an overview of the principles of colloid science and polymer science and its practical applications in cosmetic formulation chemistry. The different classes of polymers, their properties and applications in cosmetic formulations will be reviewed. In colloidal science, the topics include the dynamics of surfactants at interphases, emulsion theory, solubilised systems, foams and dispersion systems in cosmetic formulations. New technologies such as microemulsions, liposomes and the use of organofunctional silicones will be discussed as a basis for designing stable cosmetic emulsions.

CP0406
COSMETIC SCIENCE LABORATORY
Provides hands-on experience in formulating and evaluating hair and skincare products. The study of different emulsions types in creams and lotions as well as in surfactant systems will be covered. Knowledge of the major microorganisms and contamination sources causing spoilage to cosmetics will also be covered.

CP0807
MICROBIOLOGY A
Provides an overview of host-parasite relationship and its role both in the practice of diagnostic microbiology and in the management of infectious diseases. Different immune systems involved in host defence and which lead to damage in response to infection are covered.

CP0808
MICROBIOLOGY B
Aims to provide a broad understanding of the biology, pathogenesis and diagnosis of infections caused by viral, fungal and parasitic pathogens that are medically relevant or foodborne. The use of therapeutic agent and preventive strategies will be included. New emerging illnesses and their suspected etiological agents are discussed.

CP0809
MICROBIOLOGICAL TECHNIQUES
Students will acquire practical skills in both conventional and rapid methods in diagnostic bacteriology and virology.

CP0810
INDUSTRIAL, APPLIED AND ENVIRONMENTAL MICROBIOLOGY
Provides a reinforcement of the students' understanding of the microbial world. The module expands the microbiology issues beyond the medical industry into food, environmental, industrial and pharmaceutical industries. The key concepts of the applications of microbiology germane into the various industries are covered.

CP0811
RAPID METHODS AND AUTOMATION IN MICROBIOLOGY
Introduces standard and newly introduced rapid, automated methods for the detection of microorganisms, as well as molecular genotyping methods for epidemiological studies. Basic bioinformatics tools for genetic and protein analysis are included.

CP1101
FOOD PRODUCT DESIGN
Today, consumers look for new experiences in the food they consume. Food technologists have to understand the market environment and unmask consumer insights before they embark on product development activities. The module examines the business and technical perspectives for development of new product concepts. Using the knowledge and skills learnt, students will identify product strategy and develop products taking into consideration cost, ingredients, nutrition and sensory attributes.

CP1102
CONSUMER AND SENSORY STUDIES
Sensory evaluation is a very important tool for product development. Food manufacturers are recognising the value of using consumer and sensory studies to measure product acceptability, differences, improvements and opportunities. This module aims to provide deeper knowledge and practical tools in experimental design and sensory analysis. Case studies combined with hands-on sessions using statistical methods needed for sensory and consumer insight work will be used to reinforce understanding in this field.

CP1103
FOOD LEGISLATION
Food legislation compliance is important in order to safeguard the quality and safety or raw and processed food. This module exposes students to the practical issues with regard to the regulatory issues in the commercialisation of new food products for key markets. Students will apply the knowledge to evaluate ingredients, products and process for compliance with national and international regulations.

CP1104
SUSTAINABLE FOOD MANUFACTURING
This module analyses the sustainability issues in food manufacturing. Students will be exposed to minimal food processing techniques and novel technologies. Appropriate tools will be introduced and applied to improve food manufacturing processes in order to eliminate waste, decrease variation, enhance product quality and increase productivity.

CP1105
APPLIED FOOD PACKAGING
This module offers opportunities to establish connections between food chemistry, packaging design and material science. A spectrum of skills and know-how pertaining to the principles of packaging materials and technologies will be acquired. The concepts on the shelf life evaluation will also be reinforced through applications to various food products. Students will gain competency in integrating food packaging knowledge into the shelf life assessment of food products in accordance to performance, economics, brand value and identify key packaging decision making processes for the company.

CP1106
FOOD OPERATIONS MANAGEMENT
Food operations management is necessary to ensure effective and efficient food processing. This module aims to address both the "big picture" and the decision making tools. It aims to provide a practical approach to solve operations problems and develop solutions to those problems that can make a difference to a firm's competitiveness.

CP1107
APPLIED FOOD ANALYSIS
This module aims to provide an overview of the strategies in the selection of appropriate instrumental techniques. Through case studies, students will apply the strategies in method development, validation and estimation of measurement uncertainty.

CP1108
ADVANCED FOOD MICROBIOLOGY
This module aims to deepen the students' practical skills in the areas of plant sanitation monitoring and evaluation which are relevant in the food industry. Students will acquire both biochemical and microbiological techniques to detect and identify pathogens and spoilage microorganisms in different foods. Interpretation of microbiological test results will also be discussed.

CP1109
FOOD SAFETY MANAGEMENT SYSTEM
Food Safety Management System (FSMS) is an important requirement for organisations in the food chain to ensure that safe food is produced from farm to fork. The system provides a proactive, systematic and logical approach to enhance food safety compliance. This module builds on the prior knowledge of Hazard Analysis Critical Control Point (HACCP) system and Good Manufacturing Practices (GMP). It aims to emphasise effective auditing processes and techniques in setting up a FSMS using ISO22000 Standard, British Retail Consortium (BRC) Standard and crisis management programme.

CP1110
CAPSTONE PROJECT
The capstone project, designed by the company mentor and SP facilitator, allows trainees to apply their knowledge, analytical and problem solving skills specific to his/her area of work. Through the project, students will develop a better understanding of the complex process of safe food production.

CP1111
ON-THE-JOB TRAINING (OJT)
OJT enables trainees to consolidate and apply theoretical knowledge to on-the-job activities in the industry. Through this, relevant occupational skills are deepened in at least one of the three functions, namely: Food Product Innovation, Food Processing and Food Safety and Quality Management.

CP1201
MATERIAL AND ENERGY BALANCE
This module covers principles of material and energy balances. It enables learners to perform material and energy balances on common unit operations of chemical processes. Learners will apply the principles through hands-on sessions using small-scale pilot plant, process dynamic simulation software and process design simulation software.

CP1202
THERMODYNAMICS
This module covers the principles of thermodynamics for steady and unsteady state systems.
Learners would be able to derive relationships that quantitatively describe the transformation between different forms of energy on a macroscopic scale, and enable them to link the effects of thermodynamics to various process operations.

CP1203
FLUID FLOW, HEAT TRANSFER AND MASS TRANSFER
This module covers the fundamental principles and processes of fluid flow, heat and mass transfer, as well as their application in the process industry. Learners will be equipped with relevant knowledge and skills to operate and troubleshoot fluid flow, heat and mass transfer equipment.

CP1204
SEPARATION PROCESSES
This module covers design and operation of classical and advanced separation processes that are commonly found in the chemical industry. Learners will be attuned to the complex relationships between various process parameters and gain competence in the operation and troubleshooting of these processes and their associated equipment.

CP1205
CHEMICAL REACTION ENGINEERING
This module applies chemical engineering principles in the areas of chemical reaction kinetics and reactor design. Factors affecting reaction kinetics are studied to understand the interactions of mass and heat transfers with fluid flow in reactor design and operation. Various models for reactors will be studied, compared and contrasted to enable the selection of appropriate reactor to achieve maximum performance given any feed composition and operation conditions.

CP1206
PROCESS CONTROL
This module covers the applications of control strategies (classical and advanced) and technologies to equip learners with up to date knowledge and skills to control automated systems in the process industry. Learners will be equipped with relevant knowledge and skills to monitor, control and troubleshoot automated processes in a safe manner.

CP1207
PROCESS OPTIMISATION
This module covers classical and latest process optimisation strategies and systems for the chemical industry. Classical deterministic and stochastic optimisation methods will be introduced for design and process operation optimisation. Learners will utilise software to solve formulated chemical engineering optimisation problems. Latest process control and optimisation implementation will be illustrated through real world examples.

CP1208
PROCESS SAFETY
This module covers principles and applications of process safety strategies and safety management systems, with focus on relevant industrial standards and code of practices, in the process industry.

CP1209
INTERNSHIP (ON-THE-JOB TRAINING)
This module enable learners to consolidate and apply theoretical knowledge in real-world on-the-job (OJT) needs in the industry. Through this, relevant industry and occupational skills are deepened using the OJT blueprint developed by the company, subject to approval by Singapore Polytechnic.

CP1210
PROJECT
This module serves as a culmination of academic and intellectual experience for learners to investigate a problem or challenge in the area of chemical engineering. The project presents a real problem or challenge to learners to collaboratively work with the stakeholders to analyse, develop and present a resolved project outcome. Learners will be expected to demonstrate skills such as writing project proposal, experimental design, problem solving, oral communication, research capacity, media literacy, project planning, time management and personal effectiveness. Learners will be able to deepen their skills sets in core chemical engineering while broadening their soft skills to be a resourceful and resilient lifelong learner.

CP1301
SPECIALTY CHEMICALS
This module provides an overview of the chemistry and functionalities of specialty chemicals such as surfactants and additives that are utilised in high performance applications (e.g. consumer care, lubricants, adhesives, coatings, paints etc.). They may be categorised according to their functions such as dispersants, foam boosters, wetting agents, emulsifiers, cleansing agents, solubilisers, photoinitiators, colourants, light stabilisers, aesthetic enhancers, protective barriers, preservatives and others. The effective application of the ingredients will influence the final qualities of the formulations in accordance to specific requirements.

CP1302
SPECIALTY POLYMER
This module covers the science of macromolecules in terms of the underlying principles of chain- and step-growth polymerisation, concepts of average molecular mass and its distribution, polymer solution and rheology behaviour. It further develops an in-depth understanding of the relationship between structure, property and application of the various thermoplastics and thermosets.

CP1303
PERFORMANCE EVALUATION TECHNIQUES
This module aims to investigate the chemical composition, morphology, thermal, mechanical and physical properties of materials. It covers the working principles of a wide range of instrumentations for chemical analysis and material characterisation. Students will learn the application of UV-Vis/FTIR/ICP-OES and EDS spectroscopy, HPLC/GC and LC-MS/GPC chromatographic techniques, TGA, DSC, light scattering/diffraction, microscopic methods, etc. for performance evaluation purposes.

CP1304
FORMULATION SCIENCE & TECHNOLOGY I
This module aims to develop an in-depth understanding of science underlying the formulation of stable colloidal systems. Students will hone their ability to generate creative ideas and design product formulations with appropriate evaluation protocols that would bring about desirable attributes required for specific applications in consumer care. Students will be able to rationalise the underlying chemical interactions of the various ingredients as well as the principles of the different delivery mechanisms in a formulation.

CP1305
FORMULATION SCIENCE & TECHNOLOGY II
This module further extends the application of the formulation principles for other industrial product formulations (i.e. coatings, lubricants etc.). Students will leverage on the formulation science and technology to create feasible solutions for various end-use situations. With the help of case studies, students will be able to design product formulations and evaluation protocols to meet the desirable performance requirements in the targeted field of application.

CP1306
STATISTICAL DATA ANALYSIS
This module introduces the concepts and methods of statistical data analysis using statistical tool such as Minitab with emphasis on interpretation of results. Topics include review of descriptive statistics, fundamental of sampling distributions and continuous probability distributions, concepts of inference and hypothesis testing, linear regression and correlation, analysis of single factor and factorial experiments, and statistical quality control.

CP1307
SPECIALISED TOPICS
This module provides an overview of selected current topics in the Specialty Chemicals industry. It covers the concepts and principles of the latest scientific advances and technological know-hows employed which may include microencapsulation, nanomaterial and biomaterial technologies.

CP1308
PRODUCT OPTIMISATION
This module aims to provide a practical perspective in optimising formulation design and processing parameters for enhanced performance in accordance to standards and quality requirements. Students will apply their technical knowledge to achieve optimum performance characteristics with the help of experimental design methodology. Students will hone their problem solving and data analysis skills using statistical aids to optimise product formulae and processing variables.

CP1309
NEW PRODUCT DEVELOPMENT
This module analyses the different stages of new product development process (NDP) with a focus in the concepts and challenges central to product innovation, including economic, environmental, regulatory considerations during the design and development process. The principles and techniques of quality design, quality assurance and project management will also be employed.

CP1701
APPLIED NUTRITION
This module aims to provide students with a basic understanding of the science of nutrition and the importance of nutritional adequacy and balance for optimal growth and health. The Dietary sources of the major nutrients, their digestion, absorption, and metabolism are covered in the module. Students will learn the different functions of nutrients, including their deficiencies and excesses affecting health. They will also learn about the nutrient needs in the different stages of growth and learn how to read food labels.

CP1702
DIET AND DISEASE
This module provides students with an understanding of the role of nutrition in disease prevention and management, with particular emphasis of key chronic lifestyle diseases and nutrition-related deficiencies like heart disease, diabetes and osteoporosis. Student will learn to develop sound recommendations in the nutritional prevention of these diseases.

CP1703
SPORTS NUTRITION
This module aims to provide students with an overview and appreciation of the underlying principles and practice involved in the evolving field of exercise and sports nutrition. Students will be able to develop skills targeted in optimising nutrition-related strategies in both the fields of exercise undertaken for good health, as well as sports for performance.

CP1704
EXERCISE PHYSIOLOGY
The aim of this module is to provide students with an overview and appreciation of physiological principles that explain how the human body functions during exercise. Concepts such as how the different energy systems affect exercise performance as well as the body's adaptation to chronic exercise and its use of various substrates during different exercise intensities will be covered.

CP1705
PHYSICAL FITNESS CONDITIONING AND EXERCISE PRESCRIPTION
The aim of this module is to provide students with an overview and appreciation of the wide spectrum of physical fitness assessment and exercise prescription. The students will learn to apply the knowledge of exercise physiology in the fitness and performance arena to attain general wellness levels and achieve maximum performance in sport or exercise. Students will also be taught the various methods and considerations in prescribing exercise for the general and special populations.

CP1706
EXERCISE REHABILITATION
Students will gain an understanding of the process of evaluating and diagnosing movement inefficiencies, thereby improving movement quality and enhancing injuries reduction. Topics include the applications of biomechanical principles, movement analysis and therapeutic exercises principles.

CP2029
BASIC PATHOLOGY
Provides an introduction to the mechanisms of human diseases and to the morphology and clinical characteristics of a broad spectrum of disease entities at molecular, cellular, tissue, organ and organismal levels. Topics include cellular adaptations and tissue damage, inflammation, healing and repair, hemodynamic disorders, genetic diseases, cancer biology and organ pathologies. At the end of the module, students will have built the foundation for understanding human diseases on which future modules are based.

CP202Y/Z
PROJECT
Enables students to apply and integrate the knowledge and skills acquired throughout the Biomedical Science course in a research and development project. Emphasis is on independent learning, effective teamwork, problem-solving skills and communication skills in the process.

CP203Y/Z
FINAL YEAR PROJECT
Refer to CP202Y/Z

CP2033
APPLIED IMMUNOLOGY
Provides students with a broad understanding of the principles involved in diagnostic immunology. Aspects of the immune system in health and diseases are discussed in topics which include the role of the major histocompatibility complex in antigen processing and presentation, immunological tolerance and disorders of the immune response, transplantation and immunodeficiency states.

CP2034
BLOOD BANKING
Equips students with a critical appreciation of blood transfusion science and provide a broad background in both practical and theoretical aspects of this subject. Major topics will include the theoretical basis of blood transfusion, concepts in transfusion practice and clinical aspects of transfusion therapy. Organisation, management and quality control procedures will be included as appropriate together with practical experience.

CP2035
HISTOLOGICAL TECHNIQUES
Provides the practical foundation for techniques in histopathology. Emphasis is on the ability to apply theory to bench practice in tissue fixation and processing, staining and instrumentation. Cryotomy and exfoliative cytology are also introduced.

CP2052
INTRODUCTORY PHARMACOLOGY
Provides students with the basic concepts of the physiological, biochemical and anatomical interactions of chemical agents with living tissues. Pharmacological principles and mechanisms will be taught. The therapeutic and toxic actions of important drugs and poisons will also be covered.

CP2064
GENERAL BIOCHEMISTRY
Provides students with basic understanding of human biochemistry. The topics include introduction to biochemistry, nucleic acids, proteins, enzymes, vitamins and trace elements, carbohydrates, lipids and energy production.

CP2065
INTRODUCTORY ANATOMY AND PHYSIOLOGY
Introduces students to basic organisation of human anatomy and physiology. It covers the anatomical features of various systems and how it relates to physiological mechanisms and associated dysfunctions. Applications of physiology pertaining to bioengineering principles will be covered.

CP2070
CLINICAL INSTRUMENTATION AND AUTOMATION
Provides students with technical skills and principles of analytical techniques and instrumentation used in clinical laboratories. Emphasis will be on skills development, critical analysis and application of such practical techniques to the investigation and understanding of human diseases.

CP2081
ORGANIC CHEMISTRY – REACTION MECHANISM
Refer to CP4127.

CP2097
CYTOGENETICS
Provides students with an overview of the fundamental concepts and laboratory skills in cytogenetics.

CP2102
FUNDAMENTALS IN INSTRUMENTAL ANALYSIS
Provides basic practical laboratory skills and theoretical knowledge to analyse the contents of chemical compounds. In particular, the module examines sampling, UV-visible spectrometry, flame atomic absorption, solvent extraction and chromatography.

CP2103
CLINICAL BIOCHEMISTRY
Introduces students to the scope of clinical chemistry and its role in medical laboratory technology. It provides students with an overview of the work involved in the clinical chemistry laboratory. Fundamentals of routine procedures will be given together with relevant clinical information. The module also covers the range of tests usually provided in routine screening procedures and the importance of good management and quality control procedures.

CP2104
HAEMATOLOGY
Provides students with an overview of the work involved in clinical serology and haematology laboratories. Fundamentals of routine procedures will be given together with relevant clinical information.

CP2105
MEDICAL MICROBIOLOGY
Provides an overview of the etiology, clinical features, pathogenesis, laboratory diagnosis, epidemiology and control of the important bacterial, viral, fungal and parasitic pathogens that are medically relevant or foodborne. The use of therapeutic agents and preventive strategies will be included. Newly emerging illnesses and their suspected etiological agents will also be discussed.

CP2106
ADVANCED IMMUNOLOGY
Provides students with a broad understanding of the principles involved in diagnostic immunology. Aspects of the immune system in health and diseases are discussed in topics which include the role of the major histocompatibility complex in antigen processing and presentation, immunological tolerance and disorders of the immune response, transplantation and immunodeficiency states.

CP2107
INTEGRATED PATHOLOGY AND CASE ANALYSIS
Develops students with critical thinking skills and innovative thinking through review of research ideas and journal articles of scientists at the forefront of research.

CP2109
CURRENT TOPICS IN BIOMEDICAL RESEARCH
Enhances students' learning on the latest updates on scientific research, improves presentation and public speaking skills through seminars. Analysis of scientific papers through journal clubs will also be covered.

CP2110
ADVANCED CELL BIOLOGY
Provides students with concepts in cellular signal transduction, cell cycle and apoptosis. Topics on cellular structures and functions will also be taught.

CP2116
BIO-ENTREPRENEURSHIP
Aims to introduce the concept of Bio-entrepreneurship with the intent to identify business opportunities and to develop initial ideas into business plans and entrepreneurial projects.

CP2117
FORENSIC BIOLOGY
Provides students with the principles and techniques for handling and analysing biological samples collected from crime scenes and the application of DNA fingerprinting to identify suspects/victims. The various molecular biology techniques specific to forensic analysis are also applicable to many areas of biomedical research. In addition, students will be introduced to forensic pathology, a subsection of forensic science.

CP2121
CLINICAL RESEARCH MANAGEMENT
Aims to provide the knowledge and managerial skills in clinical research operations to liaise between human subjects and members of the clinical research team. This module emphasises on the planning, coordination, operational management, ethical and regulatory aspects of clinical research projects in medical and research institutions.

CP2130
LABORATORY SKILLS AND TECHNIQUES
Incorporate occupation/industry bench skills, such as microscopy, microbiology, cell culture, manipulation of nucleic acids etc. with some generic skills, such as the polymerase chain reaction, electrophoresis, centrifugation, micro-pipetting etc. Students also learn how to apply these techniques and skills in discussions of case studies during tutorials.

CP220Y/Z
BIO-DISCOVER
Project work originating from modules Bio-explore and Bio-conceptualise will be carried out by students within a holistic learning environment involving teamwork, industrial and academic interactions.

CP2200
BIO-EXPLORE
Provides students with the freedom for innovative ideation in biotechnology-related projects to allow exploration of their inquisitive minds.

CP2201
BIO-CONCEPTUALISE
Provide students with experimental design principles, current trends in R&D as well as project implementation to advance the ideation to conceptualisation of their project hypothesis, as well as fortify teamwork.

CP2203
PHYSIOLOGY AND BIOCHEMISTRY
Introduces students to the basic organisation of the human anatomy through emphasis on the physiology and biochemistry of key body systems. The biochemistry behind cellular macromolecules and physiological mechanisms underlying associated tissue dysfunctions will be covered.

CP2204
MICROBIOLOGY
Provides students with the theoretical foundation as well as practical skills in microbiology. Module emphasises on good laboratory techniques in the handling and manipulation of microbes and laboratory safety.

CP2205
IMMUNOLOGY
Provides students with an overview of the fundamental concepts of immunology and its importance in clinical medicine. The key essential types and mechanisms of immunity response in defence and disease will be covered.

CP2206
CELL AND MOLECULAR GENETICS
Students will be introduced to the fundamentals of cell and molecular biology. Topics covered include the structure and function of cells, organelles and the central dogma of molecular biology. Gene expression and manipulation for recombinant technology will be covered.

CP2207
MOLECULAR TECHNIQUES
Provides students with the practical skills in cell and molecular biology techniques. Emphasis will be on skills development and hands-on experience on the use of current molecular techniques in research and disease monitoring.

CP2208
FLOW CYTOMETRY AND MICROSCOPY
Introduces the principles and application of flow cytometry and confocal microscopy. Students will be exposed to current flow cytometry and confocal microscopy platforms for applied research.

CP2209
ADVANCED CELL BIOLOGY
Provides students with concepts in cellular signal transduction, cell cycle and apoptosis. Their deregulation and associated pathologies including cancer will be covered. In addition, students will learn about key concepts in stem cells and their reprogramming.

CP2210
BIOPROCESS AND BIOLOGICS TECHNOLOGY
Introduces bioprocess principles used in large scale production of mammalian and microbial cultures, purification and analysis of biologics. Topics include cell growth kinetics, bioreactors, protein separation and purification techniques.

CP2211
CELL AND TISSUE ENGINEERING
The upstream considerations and techniques in biologics production such as vector selection, transfection, proliferation and differentiation of cells and cell growth in bioreactors will be covered.

CP2213
DRUG DISCOVERY AND BIOINFORMATICS
Introduces the key concepts of bioinformatics and their applications including drug discovery. Basic and high throughput nucleic acids and proteins analysis as well as molecular interactions between drugs and target proteins are taught using current software programmes.

CP2215
BIOREMEDIATION TECHNOLOGIES
Provides an overview of how biotechnology, and in particular microbes, can be utilised for industrial uses and environmental bio-remediation. Students will also be introduced to different bioremediation technologies using microbes for pollutants generated by the chemical industries.

CP2216
AGROBIOTECHNOLOGY
Provides students with current techniques for application in the plant biotechnology industries as well as introduce methodologies for industrialised aquaculture farming which aids in the economic use of scarce land resources.

CP2220
PROTEOMICS
Provides an overview on the use of proteomics in biomarker discovery for disease detection. Students will also be introduced to methodology and techniques in protein extraction, separation and detection, including key techniques such as western blotting and 2D gel electrophoresis.

CP2221
GOOD BIOSAFETY PRACTICES
Provides students with the knowledge and skills to follow good biosafety practices. Students will be able to understand and follow biosafety and laboratory biosecurity principles and practices so as to minimise/eliminate potential workplace risks and threats. They will be able to interpret national and international biosafety legislations, standards and guidelines and comply with the requirements of biosafety and laboratory biosecurity in the workplace.

CP2225
CURRENT GOOD MANUFACTURING PRACTICE
Introduces students to the theory and principles in cGMP required for the manufacturing industries including pharmaceuticals and biologics.

CP2301
PHYSIOLOGY AND BIOCHEMISTRY
Introduces students to the basic organisation of the human anatomy through emphasis on the physiology and biochemistry of key body systems. The biochemistry behind cellular macromolecules and physiological mechanisms underlying associated tissue dysfunctions will be covered.

CP2302
MICROBIOLOGY
Provides students with the theoretical foundation as well as practical skills in microbiology. Module emphasises on good laboratory techniques in the handling and manipulation of microbes and laboratory safety.

CP2303
IMMUNOLOGY
Provides students with an overview of the fundamental concepts of immunology and its importance in clinical medicine. The key essential types and mechanisms of immunity response in defence and disease will be covered.

CP2304
CELL AND MOLECULAR GENETICS
Students will be introduced to the fundamentals of cell and molecular biology. Topics covered include the structure and function of cells, organelles and the central dogma of molecular biology. Gene expression and manipulation for recombinant technology will be covered.

CP2305
MOLECULAR PATHOLOGY TECHNIQUES
Aims to provide the practical basis of laboratory molecular diagnostics. Emphasis will be on skills development and hands-on experience on the use of molecular techniques to diagnose or monitor cancer, infectious diseases, and selected genetic disorders. It builds on the material taught in other modules – cell biology, molecular biology, molecular genetics, clinical chemistry, haematology, medical microbiology and basic pathology.

CP2306
HAEMATOLOGY
Aims to provide students with an overview of the work involved in clinical haematology laboratories. Fundamentals of routine procedures will be given together with relevant clinical information.

CP2307
APPLIED HAEMATOLOGY
Builds on knowledge from module CP2306, with application of haematology in the investigation and diagnosis of various diseases.

CP2308
CLINICAL CHEMISTRY
Provides students with an overview of work carried out in clinical chemistry laboratories. Fundamentals of routine procedures will be taught with relevant clinical information. The module also covers the range of tests usually provided in routine screening procedures and the importance of good management and quality control procedures.

CP2309
APPLIED CLINICAL CHEMISTRY
Provides theoretical foundation and practical skills in clinical chemistry. Students will learn the background pathophysiology of tests performed in a clinical chemistry laboratory and details of analytical methods involved.

CP2310
MEDICAL MICROBIOLOGY
Provides students with the theoretical foundation and practical skills in medical microbiology. The role of microbiology in the diagnosis, management and prevention of infections in patients will be emphasised.

CP2311
MOLECULAR MEDICAL MICROBIOLOGY
Provides students with a broad understanding of the principles involved in diagnostic microbiology and urinalysis. Identification of etiological agents of virological and parasitological diseases and their characteristics will be covered. The diagnosis, management and prevention of these diseases will also be covered.

CP2312
ADVANCES IN LABORATORY MEDICINE
Provides students with the current understanding and advancements in diagnostic laboratories with the use of relevant case studies and builds on their understanding of the various disciplines of laboratory medicine.

CP2313
GOOD BIOSAFETY PRACTICES
Provides students with the knowledge and skills to follow good biosafety practices. Students will be able to understand and follow biosafety and laboratory biosecurity principles and practices so as to minimise/eliminate potential workplace risks and threats. They will be able to interpret national and international biosafety legislations, standards and guidelines and comply with the requirements of biosafety and laboratory biosecurity in the workplace.

CP2315
BIOCHEMISTRY
Students will have an overview of basic concepts in metabolism with emphasis on relationships and interactions between the pathways and tissues. In addition students will learn the major biosynthetic and degradative pathways of biomolecules with emphasis on energy generation and consumption; and the integration of these pathways in living cells.

CP2316
CLINICAL APPLICATIONS OF CARDIAC DRUGS
The module aims to provide students with an overview of the indication, adverse drug reaction and clinical application of commonly used cardiac medications. Students will also learn to perform calculations for the administration of medications. Commonly used medical abbreviation is also introduced in this module.

CP301Y/Z
PROJECT
Allows students to work independently with professionals and academic supervisors in designing protocols for clinical research and analysis of results to solve practical problems. Students work in small groups under the supervision of a lecturer. Grading is by in-course assessment and project seminar.

CP3013
OCULAR PHARMACOLOGY
Introduces students to the basic concepts of pharmacology and ocular drugs. Ocular diagnostic and therapeutic drugs such as mydriatic, miotic, cycloplegic and glaucoma drugs are covered. Students are given a good understanding of ocular and systemic side effects of ocular and some commonly seen general drugs.

CP3022
CLINICAL PRACTICE I
Develops the clinical critical thinking and problem solving skills of optometry students by hands-on clinical experience in patient examination.

CP3024
CLINICAL PRACTICE II
Further develops the clinical skills needed to competently examine patients in optometric practice, and recommend appropriate treatment, strategies and management for patients presenting for primary eye care.

CP3035
PHYSIOLOGICAL AND VISUAL OPTICS
Provides information on the function of the visual pathway, including the study of spectral sensitivity, colour perception and luminance. The module introduces the eye as an optical instrument. Topics include emmetropia and ametropia of the eye, distribution and correction of refractive errors, visual resolution and ocular aberrations, ocular transmission characteristics, retinal stimulus pattern and basics of eye movements.

CP3047
GEOMETRICAL AND PHYSICAL OPTICS
Covers the study of physical optics, aberrations, photometry, laser and fibre optics. It also provides a basic understanding of the optics of thin lenses, lens systems and aberrations.

CP3048
OCULAR ANATOMY AND PHYSIOLOGY
Aims to give students an understanding of the anatomy and functions of the eye. Students learn the structural details of the eye and its surroundings and the importance of their physiology in maintaining good vision.

CP3052
CONTACT LENS PRACTICE I
Develops students' clinical critical thinking and problem solving skills in contact lens consultation and examination.

CP3053
CONTACT LENS PRACTICE II
Provides in-depth clinical experience in diagnosis of contact lens complications and development of patient management skills.

CP3055
HUMAN PHYSIOLOGY AND CELL BIOLOGY
Introduces students to the structures of various organs in the human body and the relationships among their systems, functions and biochemical activities. It also provides the foundation in cell and molecular biology.

CP3056
OCULAR DISEASE I
Provides an overview of the science of microbiology, with an emphasis on the application to the study of ocular infections. The module covers the diagnosis and management of anterior segment of the eye in response to local pathologic processes (e.g. infection, trauma, neoplasm) and disorders (e.g. congenital).

CP3057
OCULAR DISEASE II
Covers the diagnosis, referral and management of eye conditions in response to degenerations, injuries and systemic pathologic processes with emphasis on the conditions of the posterior segment of the eye.

CP3060
CLINICAL OPTOMETRY I
Provides students with an understanding of clinical optometric process in eye consultation. This is the first of four modules to build students' competency in clinical optometry. It develops students' technical skill and competency in performing vision assessment. This module gives students the opportunity to work with patients early in their educational experience.

CP3061
CLINICAL OPTOMETRY II
Develops students' clinical problem solving skills related to patients' refractive error through case study discussions. It also provides the opportunity for students to work with patients.

CP3062
CLINICAL OPTOMETRY III
Builds up on Clinical Optometry I and II with the technical skills to assess the anterior ocular health of patient.

CP3064
LOW VISION AND COMMUNITY HEALTH OPTOMETRY
Introduces students to the health care delivery system within Singapore and optometrists' role in this system. It also provides students with the knowledge of public health and in particular vision and ageing, blindness and low vision. The module also provides the techniques and rationale of visual ergonomics, lighting, vision demands at work and recreation including industrial ocular hazards and their prevention.

CP3066
CONTACT LENSES
Covers the principles of contact lens and integrate them with students' understanding of the cornea, tear film and eyelid anatomy. The emphasis is also on the acquisition of contact lens-related clinical skills, problem solving and clinical decision making in the fitting of soft and rigid gas permeable contact lenses.

CP3067
BINOCULAR VISION AND PAEDIATRIC OPTOMETRY I
Introduces the motor and sensory aspects and development of binocular vision and

anomalies of adults and paediatric population. Topics include monocular and binocular eye movements, anomalous binocular fixation, amblyopia, strabismus and nystagmus.

CP3068
BINOCULAR VISION AND PAEDIATRIC OPTOMETRY II

Covers the motor and sensory aspects and development of binocular vision and anomalies with more emphasis on eye examination and management of paediatric patients, and patients with strabismus.

CP3069
RESEARCH METHODS IN OPTOMETRY

Provides students with the basic concepts of research methods in the areas of Vision Science and Optometry. Statistical software is used extensively to perform and simplify statistical calculations.

CP3071
OPHTHALMIC OPTICS

Covers the manufacturing, measurement, standards and specifications of ophthalmic lenses and spectacle frames. Students learn the skills of transforming a prescription into high quality eyeglasses.

CP3072
OPHTHALMIC DISPENSING

Teaches advanced techniques of spectacles assembly. Students learn about the application of latest ophthalmic products and their performance. This module will equip students with the skills to dispense optical appliances to patients in the most effective way.

CP321Y/Z
PROJECT

Enables students to work in small groups and learn independently through critical and analytical approaches of doing research. Students are expected to present a project report at the end of the module.

CP4001
ANALYTICAL AND PHYSICAL CHEMISTRY

Provides students with the fundamentals in analytical and physical chemistry. Students will learn the basic concepts of moles, concentrations in different units, redox reactions and equilibrium. Students also acquire basic practical skills to analyse a range of substances quantitatively through simple volumetric analytical procedures.

CP4006
INORGANIC AND ORGANIC CHEMISTRY

Provides students with the essential knowledge and understanding of the fundamental principles of inorganic and organic chemistry. It enables students to understand the theoretical basis of physical and chemical properties of molecules. Students will also have a broad understanding of the chemical reactions of various functional groups of organic compounds.

CP4009
BASIC INSTRUMENTAL ANALYSIS

Provides basic practical laboratory skills and theoretical knowledge to analyse the contents of chemical compounds using various forms of spectroscopy and chromatography. Sampling and solvent extraction used in analyses are also covered in this module.

CP4036
QUALITY ASSURANCE AND STATISTICS

Provides an understanding of the important concepts on quality assurance, statistical analysis and experimental design in the chemical manufacturing industry. Topics covered include statistical tools used for quality assurance, hypothesis testing, analysis of variance, factorial design of experiments and acceptance sampling plan.

CP4048
ADVANCED INSTRUMENTAL AND LAB TECHNIQUES

Aims to provide students with theoretical knowledge for the qualitative and quantitative analysis of chemical compounds and practical skills in advanced instrumental and laboratory techniques. It provides students with a capability for problem solving and recommending appropriate techniques to analyse an unknown compound. The student learns to think independently as well as to communicate effectively with colleagues. This module builds on the learning in module CP4009 Basic Instrumental Analysis.

CP4086
LABORATORY MANAGEMENT

Equips the students with the essential knowledge and skills in ensuring good laboratory management in accordance to ISO17025 requirements for accreditation as a competent chemical testing laboratory. The module also encompasses validation of analytical testing methodology; measurement of uncertainty to ascertain the accuracy of results and safety management of chemicals in a laboratory. In addition, students are taught essential statistical techniques (F-test, T-test and Q-test) for evaluation of test results. Case studies of laboratory audits are also used to enhance students' understanding in the operation of an ISO17025 accredited laboratory.

CP4098
FORENSIC CHEMISTRY

Provides students with laboratory skills and theoretical knowledge of forensic chemistry. Also provides students with the capability for developing problem-solving skills and encouraging students to think and learn independently.

CP4103
ADVANCED ORGANIC CHEMISTRY

Provides students with knowledge of functional group transformation; disconnection approach to synthesis; stereochemistry and reaction mechanisms; basic theory and applications of spectroscopic methods in organic chemistry, such as IR, MS and NMR. It aims to strengthen students' fundamental knowledge in organic chemistry so that students are able to explain important reaction pathways, devise organic syntheses and elucidate organic compounds with acquired advanced instrumental data.

CP4121
PHARMACEUTICAL MICROBIOLOGY

Provides students with an overview, basic knowledge and skills on aspects of biotechnology that are applicable to the production of biopharmaceuticals.

CP4122
BASIC BIOCHEMISTRY

This module aims to provide students with an understanding of the structures of macromolecules like water, protein, carbohydrates, lipids and enzymes and enzyme kinetics. Their roles within the cells will also be covered in this module.

CP4123
PHARMACEUTICAL MANUFACTURING

Refer to CP5037.

CP4127
ORGANIC CHEMISTRY — REACTION MECHANISM

Provides students with the fundamentals of organic synthesis and reaction mechanisms. Topics include stereochemistry, chemical kinetics, substitution, addition and elimination reactions.

CP4128
ENVIRONMENTAL STUDIES
Provides students with knowledge of the underlying principles and key concepts of environment science and how these can be applied to the resolution of contemporary issues on global warming, climate change, environmental degradation, transboundary pollution, species extinction, soil remediation, etc. Also included are topics on occupational safety and health at the workplace and the applicable segments of the Workplace Safety and Health Act 2006. Practical classes will impart to students hands-on laboratory skills and experience relating to air and water pollution while individual case studies assignment will develop students' awareness and global perspective of the current developments in environmental science and management.

CP4129
ENVIRONMENTAL SYSTEMS AND MANAGEMENT
Provides students with practical and theoretical knowledge on environmental technology. Creates awareness of environmental protection and pollution control. Students learn to think independently, solve problems either individually or as a team and to communicate effectively.

CP4135
LABORATORY SKILLS IN ANALYTICAL AND PHYSICAL CHEMISTRY
Aims to equip students with the analytical and observation skills critical for working in the laboratory. They will acquire these skills through different experimental methods with particular emphasis on the appropriate use of different glasswares, common weighing balances, micropipettes and glass pipettes. The skills and knowledge learnt will also reinforce the theories covered in the physical and analytical modules which provide the foundation for the second and third year modules. Upon successful completion of this module, students should be able to carry out essential analytical and physical experiments independently. They will also be able to write a formal scientific report.

CP4136
LABORATORY SKILLS IN INORGANIC AND ORGANIC CHEMISTRY
Aims to equip students with the analytical and observation skills critical for working in the laboratory. These skills will be developed through experiments emphasising on recrystallisation, filtration, melting point determination and qualitative analyses of inorganic and organic compounds. The skills and knowledge learnt will also reinforce the theories covered in the inorganic and organic modules which provide the foundation for Year 2 and Year 3 modules. Upon successful completion of this module, students should be able to carry out essential inorganic and organic experiments independently. The will also be able to write a formal scientific report.

CP4137
PHYSICAL CHEMISTRY
Provides students with a fundamental understanding on how materials behave and how chemical reactions occur at the molecular and atomic level. It enables students to gain knowledge on the concepts of equilibrium thermodynamics, where a unified view of equilibrium, physical and chemical changes would enhance their insights into the relevant chemical reactions in various industries. Students will also be able to relate physical sciences to everyday life occurrences and recognise the importance of physical chemistry in their lives.

CP4138
ANALYTICAL CHEMISTRY
Provides students with the fundamentals of analytical chemistry. The students will learn the basic concepts of important chemical reactions in aqueous medium (including acid-base neutralisation and oxidation-reduction reactions) and the underlying principle of a typical analytical procedure. They will also be able to apply the knowledge acquired, in particular titrimetric analysis, to determine chemical substances quantitatively through stoichiometric calculations.

CP4139
INORGANIC CHEMISTRY
Aims to provide an understanding of the fundamental aspects of inorganic chemistry such as atomic structures, chemical periodicity, chemical bonding and the chemistry of transition metals that will be essential for the understanding of other chemistry disciplines.

CP4140
ORGANIC CHEMISTRY
Provides students with a basic knowledge of organic functional groups, and they will be able to apply requisite IUPAC nomenclature rules to name and draw structures of fundamental organic compounds. They will also have the ability to generate structural isomers of organic compounds. In addition, students will have developed a theoretical understanding of the chemical reactions that key functional groups undergo (substitution, addition, condensation, hydrolysis, neutralisation, oxidation and reduction reactions). They will have a qualitative understanding of the physical properties (boiling points and solubilities) of principal organic compounds too.

CP4141
BIOMATERIALS
Biomaterials may be the most multidisciplinary of all fields and the impact to people is huge. Because of this impact and multidisciplinary nature, biomaterials is always an exciting area for study and application. The module aims to guide the students to appreciate the structure-property relationships of biomaterials, their applications in pharmaceutical industry as well as highlights some common biological testing of biomaterials.

CP4142
POLYMERIC MATERIALS
Provides students with knowledge of both commodity and engineering plastics pertaining to their manufacture, properties and applications. Students will also learn about cost effective additives such as heat stabilisers, plasticisers, nucleating agents and fillers that enhance performances.

CP4143
METALLIC AND CERAMIC MATERIALS
Deals with two important classes of engineering materials i.e. metals and ceramics. Building on their foundation of materials science, students will be able to understand the structures, properties and applications of metals and their alloys. Students will also study ceramics in relation to their properties, i.e. magnetic, thermal, optical and electrical. In addition, students will gain an overview of the importance and the properties of these materials in various related industries.

CP4144
MATERIALS CHARACTERISATION & FAILURE ANALYSIS
Provides students with an overview of the common testing and characterisation techniques, including mechanical testing, infra-red spectroscopy, thermal analysis, chromatography and microscopy.

CP4146
MATERIALS PROCESSING
Covers the processing methods for different materials and students will be able to apply concept and fundamental knowledge to compare the processes between the different materials that are used in industries.

CP4147
MATERIALS AND ITS APPLICATIONS
Provides the fundamental knowledge of the various categories of materials including polymers, metals and alloys, ceramics,

composites and advanced materials such as nanomaterials, biomaterials, smart materials and green materials. It will enable students to understand the structures, properties and their applications in the different industries such as food, aerospace, clean technology and healthcare. Activities illustrating the concepts will be incorporated to create a more engaging and stimulating learning environment.

CP4148
MATERIALS PROCESSING SKILLS

Aims to equip students with the skills and knowledge critical for processing of different materials. They will acquire these skills through carrying out commonly used processes for polymers, metals and ceramics. The skills and knowledge learnt will also reinforce the theories covered in the materials and materials processing modules. Upon successful completion of this module, students should be able to select and carry out an appropriate processing method for different materials.

CP4149
MATERIALS LABORATORY SKILLS

Aims to equip students with the skills critical for testing and characterising different materials. They will acquire these skills through different experiments. The skills and knowledge learnt will also reinforce the theories covered in the lectures which provide the basis for third year module. Upon successful completion of this module, students should be able to carry out essential testing and characterisation of materials independently.

CP4153
MATERIALS INNOVATION AND DESIGN

Provides students with knowledge of the fundamentals of product design, development and commercialisation, specialising in materials. It will also give them practice in using appropriate methods and techniques in product modelling and rapid prototyping, e.g. 3D prototyping. The subject also supports the overall course aim of developing problem-solving skills and encouraging students to think and learn both independently and in a team.

CP4155
COATINGS AND ADHESIVES

Provides students with knowledge on the properties and applications of different types of surface coatings, adhesives and inks. Students will be given an overview on selecting polymers and additives to produce the formulations. The characteristics, evaluation of performance and applications of coating products will also be covered.

CP4156
ELASTOMERS

Provides the fundamental knowledge of the structure and properties of elastomeric materials. Students will also learn how to design compounds for specific application.

CP4158
MEDICINAL CHEMISTRY

Explains the drug discovery, design and development process and how new chemical entities are identified and developed into commercial drugs. Students will be given case studies and learn to evaluate the viability of the drug from the chemical, pharmaceutical and legal approach.

CP4159
SPECIALTY CHEMICALS

Covers the fundamentals and applications of industrial specialty chemicals such as detergents, dispersants, chemical additives, fine chemicals and industrial catalysts. Also included are polymers, solvents, fuel additives and synthetic base oils. Key manufacturing processes and raw materials optimisation are also covered.

CP4160
PETROCHEMICALS AND ITS APPLICATIONS

To provide students with the detailed theoretical knowledge of the various processes and the chemistry involved to refine petroleum to basic chemical building blocks, followed by their conversion to some useful common and specialty chemicals. The importance of petrochemicals to Singapore's economy is discussed. Students will acquire the essential skills to determine the physical and chemical properties of petroleum products and petrochemicals.

CP4163
PHARMACOLOGY AND PHARMACEUTICAL CHEMISTRY

Provides knowledge on the pharmaceutical industry and its products. It outlines the drug development process from synthesis to market launch and describes common drug classes and their applications in terms of structure- activity relationships, mechanisms of action, therapeutic uses and side effects. Students will gain theoretical and practical skills on the synthesis and analysis of active pharmaceutical ingredients and finished dosage forms.

CP4164
ADVANCED MATERIALS

Recent technological breakthroughs and the desire for new functions have generated demand for novel and innovative materials. The effort of developing innovative advanced materials like nanomaterials, biomaterials, green materials and composite materials has been on the increase. The module will provide an introductory knowledge to the structures, properties, applications and current development of the different advanced materials, to equip the students with deep skills and knowledge to explore the materials' novelty.

CP4166
CGMP AND VALIDATION

Provides students with the fundamental principles and concepts of current good manufacturing practices and validation. It describes the various guidelines and the requirements for areas in applied chemistry with special emphasis on pharmaceutical industries. This module also equips the students with the knowledge on validation of various processes and equipment used in a cGMP manufacturing environment.

CP4167
ADVANCED PHYSICAL CHEMISTRY

Concepts are needed for the understanding of equilibria in chemistry as well as the practical importance to study the rates of reactions for the purpose to predict how quickly a reaction mixture approaches equilibrium. Equilibria include physical change (e.g. fusion and vaporisation) and chemical change, including electrochemistry. Moreover, the understanding of thermodynamics in particular of enthalpy and entropy is where we can deliver a unified view of equilibrium and the direction of spontaneous change in terms of the chemical potentials of substances. The topics covered in this module shall help students' learning of other modules such as colloid chemistry and basic pharmacology and pharmaceutical sciences.

CP4168
BIOPROCESS ENGINEERING PRINCIPLES

Provides students with basic principles and practical skills related to the production of biologics such as recombinant therapeutic proteins and antibodies, building on their competencies acquired in the Basic Biochemistry, Pharmaceutical Microbiology and Forensic Chemistry modules they have taken earlier. The focus will be on cell culture and protein purification operations including bioreactors and liquid chromatography. The knowledge and skills in this module will lay a good foundation for students to further develop themselves in biopharmaceutical manufacturing or research in future.

CP4170
CAPSTONE PROJECT
Enables students to apply and integrate the knowledge and skills acquired throughout the course to solve problems involving product design and development. Emphasis is placed on independent learning, teamwork, problem-solving and communications skills.

CP4503
CELL BIOLOGY
Provides students with an overview and appreciation of the biology of cells and microorganisms. The module emphasises the importance of living cells and microorganisms to man and the environment. Students will have practical experience with basic biological lab techniques.

CP4507
INTRODUCTION TO FRAGRANCES AND FLAVOURS
Students will acquire the foundation knowledge to participate/contribute effectively in any industry where fragrances and flavours are used. They will learn the proper techniques of smelling and identifying the different types of fragrance and flavour raw materials. They will also be able to apply the underlying principles of fragrance and flavour composition to create a simple fragrance base and make a presentation on a proposed product incorporating this fragrance based on user preference. In addition they will have a good understanding of the fragrance and flavour manufacturing processes.

CP4508
BASIC INSTRUMENTAL ANALYSIS
Refer to CP4009.

CP4509
COLLOID CHEMISTRY
Colloid chemistry represents the core discipline on which cosmetic science is based. The majority of personal care products are made up of more than one phase. The physical properties of the formulations we develop are influenced by the basic principles of colloid and surface science. This module will equip the students with foundation of knowledge in the relevant areas within colloid chemistry.

CP451Y/Z
PROJECT
Enables application and integration of the knowledge and skills acquired throughout the course to solve practical problems involving product development, experimental analysis, chemical synthesis or applied R&D. Students work in small groups under the supervision of a lecturer. Grading is by in-course assessment and project seminar.

CP4510
ORGANIC CHEMISTRY — REACTION MECHANISM
Refer to CP4127.

CP4511
SKIN CARE RAW MATERIALS AND PRODUCTS
Covers a detailed study of raw ingredients used in skin care products. Formulations, preparations and evaluations will be covered across main areas in personal care from anti-ageing creams to colour cosmetics and sunscreens. New technologies in microemulsions, liposomes, skin lightening and skin delivery systems will be included. In practical sessions, students will have hands-on experience in formulating skin care products.

CP4513
QUALITY ASSURANCE AND STATISTICS
Refer to CP4036.

CP4514
FRAGRANCE AND FLAVOUR CHEMISTRY
Students will learn how the raw materials in fragrances and flavours are obtained and used. They will also be taught how to predict the possible chemical reactions that may take place when raw materials are mixed together. They will be exposed to the different areas of fragrance applications and learn how to develop a product based on the requirements of the current market.

CP4515
HAIR CARE RAW MATERIALS AND PRODUCTS
Covers a detailed study of raw materials such as surfactants, polymers, fragrances, colorants, preservatives and other ingredients for hair products. At the end of the module, students would have an intimate knowledge of the raw materials used in different hair products and learn about the different preparation, testing and evaluation methods for quality control, safety regulations and stability studies. They will be able to formulate different hair products in a team.

CP4516
ADVANCED INSTRUMENTAL AND LABORATORY TECHNIQUES
Refer to CP4048.

CP4517
ADVANCED ORGANIC CHEMISTRY
Refer to CP4103.

CP4518
THE ART OF PERFUMERY
Covers a brief history of how perfumes evolved over the years. The students will also be introduced to the classics of perfumery such as Joy, No. 5 and L'air du Temps. The applications of fragrances will be covered to depict the evolution of perfumery. During the practical sessions, students will learn how to construct simple floral bases such as rose and jasmine as well as concoct simple base formulations. These simple base concoctions will be dosed into different products to illustrate the applications of fragrances.

CP4521
LABORATORY MANAGEMENT
Refer to CP4086.

CP4522
FORMULATION SCIENCE OF COSMETICS
Studies the chemistry behind cosmetic products formulation. Different emulsion types in creams and lotions as well as in surfactant systems will be covered. The important role of surfactants, oils in the formulation and manufacture of cosmetics and toiletries will be discussed. The selection of different types of raw materials to form a stable cosmetic product will be demonstrated as well as the application of HLB system. Students will have hands-on experience in the selection of surfactants, emollients, emulsifiers, fragrances and preservatives for different cosmetics.

CP4527
LABORATORY SKILLS IN ANALYTICAL AND PHYSICAL CHEMISTRY
Refer to CP4135.

CP4528
LABORATORY SKILLS IN INORGANIC AND ORGANIC CHEMISTRY
Refer to CP4136.

CP4529
ANALYTICAL CHEMISTRY
Refer to CP4138.

CP4530
PHYSICAL CHEMISTRY
Refer to CP4137.

CP4531
INORGANIC CHEMISTRY
Refer to CP4139.

CP4532
ORGANIC CHEMISTRY
Refer to CP4140.

CP4537
SAFETY ASSESSMENT, GMP AND COSMETIC REGULATIONS
Provides an overview of the relevant regulatory framework and standard practices adopted for ascertaining the safety aspects of personal care and cosmetic products to be used by consumers. Students will learn about the quality management system, the Good Manufacturing Practice (GMP) principles and standards for applications in the manufacturing process of cosmetics – from raw materials to finished products; from facilities and equipment to packaging and labelling. Finally, the students will be taught on the fundamentals of toxicology and the various methodologies and alternative testing methods to evaluate the safety of ingredients and formulations.

CP4538
PRODUCT INNOVATION AND MANAGEMENT
Covers the various product developmental stages from conceiving creative ideas, prototyping to planning of feasible marketing strategy. It is an integrated hands-on module for students to engineer commercially viable fragrances and/or cosmetic innovations by leveraging on Design Thinking framework.

CP4539
ADVANCED PHYSICAL CHEMISTRY
Refer to CP4167.

CP451Y/Z
PROJECT
Enables application and integration of the knowledge and skills acquired throughout the course to solve practical problems involving product development, experimental analysis, chemical synthesis or applied R&D. Students work in small groups under the supervision of a lecturer. Grading is by in-course assessment and project seminar.

CP453Y/Z
EXTENDED INTERNSHIP PROGRAMME
This year-long programme offers meaningful work attachments in discipline related industries. The valuable work experience will not only help our students apply their knowledge acquired in their course to solve real-life problems but also gain an in-depth insight into the chemical industries, in particular the burgeoning cosmetics and fragrance industry, as well as understand the dynamics of changes in their workplaces. This intensive out-of-the-classroom training will hone the life skills of our students in the areas of effective communication, teamwork, project management and emotional resilience so that they become better equipped to serve the industry upon their graduation.

CP5006
ENVIRONMENTAL ENGINEERING
Provides students with basic understanding of environmental pollution and its various treatment technologies such as water and wastewater treatment. Students will also be introduced to legislations relating to environmental protection in Singapore and concepts of environmental management system. Students are also required to complete a project-based on real-world issues that will serve to instill ethical responsibility and develop global perspective.

CP5031
MEMBRANE SCIENCE AND TECHNOLOGY
Provides students with basic understanding of membrane science and their applications in chemical, environmental and biomedical engineering. Examples of such applications include gas separation and pollution control.

CP5038
INDUSTRIAL WASTE MANAGEMENT
Provides students with basic understanding of different types of industrial wastes such as petrochemical and semiconductor wastes, as well as their proper treatment technologies and management strategies.

CP5054
FUEL CELLS & BIOMASS ENERGY
This module aims to provide students with an understanding and appreciation of fuel cell technology and energy from biomass systems. Students will learn the working principle of various fuel cell types and be familiarized with its operation via hands-on practical sessions. This module will also introduce students to the sources of biomass energy and its potential as an alternative clean energy source. The topic on biodiesel production is included alongside an industrial visit to a biofuel production plant.

CP5062
PLANT DESIGN ECONOMICS AND SUSTAINABLE DEVELOPMENT
Provides students with an opportunity to complete process design of a selected chemical plant using process simulation design software. Students will also need to access viability of their design projects through making critical decisions and rigorous project cost estimation, as well as applying sustainable development principles.

CP5065
INTRODUCTION TO CHEMICAL PRODUCT DESIGN
Provides students with basic understanding of chemical product design. Students will also be given an opportunity to create chemical products of at least limited functionalities.

CP5070
CHEMICAL PRODUCT DESIGN AND DEVELOPMENT
Provides students with an opportunity to refine and improve their chemical products from CP5065 Introduction to Chemical Product Design using chemical product development techniques such as TRIZ and reverse engineering.

CP5071
GREEN ENGINEERING AND ALTERNATIVE ENERGY
Provides students with basic understanding of sustainable green engineering in chemical industries and alternative energy sources such as biofuels and fuel cells.

CP5082
PETROLEUM REFINING AND ENHANCEMENT TECHNOLOGIES
Provides students with basic understanding of petroleum refining and enhancement technologies such as thermal cracking and catalytic reforming.

CP5083
PETROCHEMICALS AND CONVERSION TECHNOLOGIES
Provides students with basic understanding of different types of petrochemicals such as ethene and benzene, as well as their conversion technologies such as pyrolysis cracking and hydrogenation.

CP5084
SPECIALTY CHEMICALS AND PRODUCT FORMULATIONS
Provides students with basic understanding of different types of specialty chemicals such as water-soluble polymers. Students will also be introduced to product formulation techniques for specialty chemicals.

CP5087
ENVIRONMENTAL BIOREMEDIATION TECHNOLOGIES
Provides students with basic understanding of environmental monitoring for different types of environmental pollutions. Students will also be introduced to different bioremediation technologies for recalcitrant chemicals and pollutants that are generated by the chemical industries.

CP5088
CAPSTONE PROJECT
Provides students who are pursuing a Concentration in Petrochemical or Biopharmaceutical or Environmental Engineering an opportunity to carry out applied research projects in a specialised topic of their choice.

CP5089
STATISTICS
Provides students with basic understanding of quality assurance and statistical analysis in the energy and chemical industries.

CP5090
INTRODUCTION TO CHEMICAL ENGINEERING
Provides students with basic understanding of chemical engineering principles and measurements. Students will also be provided a basic understanding of the chemical engineering profession via tasks that mimic real-world work that are typical of chemical engineers and chemical engineering technologists.

CP5091
MATERIALS FOR DESIGN
Provides students with basic understanding on material selection and its effects on form, look and functionality of chemical engineering products. Students will also be introduced to concepts of sustainable development in material selection.

CP5092
CHEMICAL ENGINEERING THERMODYNAMICS
Provides students with basic understanding of thermodynamic principles such as ideal gas laws and Henry's law on reactive and non-reactive processes.

CP5093
HEAT TRANSFER AND EQUIPMENT
Provides students with basic understanding of heat transfer mechanisms such as conduction and convection, as well as their applications in industrial heat transfer equipment such as shell-and-tube heat exchanger and climbing film evaporator. Students will also be introduced to heat transfer phenomena such as evaporation and boiling and concepts of sustainable development via heat integration will also be covered. Students will also learn process simulation design software to perform heat exchanger design and sizing.

CP5094
FLUID FLOW AND EQUIPMENT
Provides students with basic understanding of fluid flow behaviours, operating principles of rotating equipment and their applications in the chemical process industries.

CP5095
SEPARATION PROCESSES AND SIMULATION
Provides students with basic understanding of mass transfer principles and their applications in separation processes such as distillation and liquid-liquid extraction. Students will also learn process simulation design software to perform distillation column design and sizing.

CP5096
PROCESS INSTRUMENTATION AND CONTROL
Provides students with basic understanding of process parameters measurements using different measuring instruments. Students will also be introduced to control of process parameters using different process control strategies such as feedforward control and cascade control.

CP5097
CHEMICAL REACTION ENGINEERING
Provides students with basic understanding of chemical reaction kinetics and their applications in designing chemical reactors such as CSTR and PFTR. Students will also be introduced to concepts of sustainable development via green chemical reaction processes.

CP5098
CHEMICAL ENGINEERING DESIGN CALCULATIONS
Students learn to perform design and sizing calculations for various unit operations and utility lines and equipment. Students will also learn process simulation design software to model the processes.

CP5099
PHARMACEUTICAL MANUFACTURING
Provides students with basic understanding of major unit operations such as crystallisation and purification in pharmaceutical manufacturing processes.

CP5100
BIOPHARMACEUTICAL ENGINEERING
Provides students with basic understanding of major unit operations in large-scale biopharmaceutical production, as well as the respective equipment and instruments used.

CP5101
PLANT SAFETY AND ENGINEERING ETHICS
Provides students with basic understanding of loss prevention principles and safe work practices, as well as their applications in safety management in chemical process plants. Students will also be introduced to relevant Singapore Standards such as SS586.

CP5201
LAB AND PROCESS SKILLS 1
Students learn basic skills required in the laboratory and process operations, including interpreting PFDs and P&IDs and perform line tracing.

CP5202
LAB AND PROCESS SKILLS 2
Students learn to operate pumps, commission heat exchangers, start-up and shut down unit operations.

CP5203
PROCESS OPERATION SKILLS 1
Students learn to start-up and shut down various separation process unit operations, maintain steady-state through monitoring and controlling process parameters.

CP5204
PROCESS OPERATION SKILLS 2
Students learn to start-up and shut down various reactors, maintain steady-state through monitoring and controlling process parameters, as well as perform process troubleshooting.

CP6001
INTRODUCTORY FOOD SCIENCE
The sustainability of food sources and supply is a critical concern in an ever expanding global population. After completing this module, students will appreciate the role of food science and technology, in providing safe, sustainable and quality food products, from farm to consumers locally and globally. They will examine various food materials and their technologies, such as beverage technology, cereal technology, egg and dairy technology, meat and seafood technology and fruit and vegetable technology.

CP6004
FOOD CHEMISTRY
Provides a unified picture of food from a chemical standpoint. The primary emphasis is on the composition of foods and the changes when they are subjected to processing. At the end of the module, the students will have competence to comprehension level in basic food biochemistry viz. water, carbohydrates, lipids, proteins and enzymes sufficient for them to tackle other subjects in Food Science and Technology in the subsequent modules.

CP6006
FOOD MICROBIOLOGY
Aims to reinforce students' understanding of the microbial world. This module will emphasis on students' practical skills in the areas of new foodborne pathogenic microorganisms. The students will be taught on the improved methods for detecting and enumerating foodborne microorganisms and spoilage

microorganisms. This will enable them to acquire and develop a full appreciation of the microbiological techniques, and take on responsibility in maintaining the quality and safety of our foods.

CP6009
FOOD PRODUCT DESIGN AND DEVELOPMENT

Enhancing the sensory appeals and increasing the nutritional benefits and shelf life of food products require specific food ingredients or additives. These two important areas in food science have been taught to students via modules like Food Processing and Food Ingredients in Year 1 and Year 2. This module involves the design, management and evaluation of food products, from conceptualisation to launch in the market. Design thinking will also be adopted to aid in concept development of new food products. Various statistical methods applied in sensory evaluation will be taught. With a sound background in food product development and sensory analysis, students will utilise their knowledge and skills to develop food products for consumer acceptability and current food trends with good sensory and nutritional qualities and marketability.

CP601Y/Z
PROJECT

Enables application and integration of the knowledge and skills acquired throughout the course to solve practical problems involving food product design and development, shelf life study, food analysis, packaging and food processing. Students work in small groups under the supervision of a lecturer. Assessment is by in-course assessment and project seminar.

CP6023
PHYSICS

Provides students with basic concepts and principles of physics, laying the foundation to prepare students for other science and engineering subjects in the field of Food Science and Technology. Students are encouraged to discover the exciting world of physics by working on food-related mini projects.

CP6024
ORGANIC CHEMISTRY – REACTION MECHANISM

Refer to CP4127.

CP6027
FOOD INGREDIENTS

To feed an ever growing world population, food need to be mass produced in manufacturing facilities. In order to preserve their sensory appeals, specific food ingredients or additives must be included. Students will learn about the knowledge and functions of various ingredients used in processed foods, and the technique of applying these ingredients in the laboratory setting.

CP6031
FOOD PROCESS ENGINEERING

Aims to prepare students for the large scale production of foods in order to extend the shelf life and add value to raw materials. Students will learn the fundamental principles and engineering concepts needed in the separation and purification operations in the food processing industry. This module builds on the earlier Food Processing knowledge and provides the foundation for Process Design and Implementation in which separation and purification processes are needed in the production process design of any given food product.

CP6032
INSTRUMENTAL ANALYSIS

Consumers become more demanding, more critical, and broader in their food selections. These behaviours have led to the development and increased industrialisation of the food supplying chains. Thus, food quality and safety have become the dominant issues in today's food economics in order to satisfy consumers. The demand for higher quality and safer food has called for a need for accurate, appropriate and rapid analytical tools to investigate food. Advances in instrumental analysis, for example chromatography and spectroscopic techniques, play an important role in ensuring food safety and quality from farm to fork. Hence this module aims to familiarise students with the basic concepts of chromatography and spectroscopy and to equip them with the technical skills to operate and perform advanced instrument analytical techniques for food analysis.

CP6033
FOOD SAFETY AND QUALITY MANAGEMENT

When food is processed on a large scale, there are many instances where safety may be compromised and consequently their consumption may adversely affect the health and safety of the consumer. The knowledge and understanding of food safety, quality and quality systems as well as legislation thus become important to anyone working in food processing and production. At the end of the module, students will would have a good overview of the standards and legislations relating to the quality and safety of the ingredients, processing systems and equipment as well as the packaging and sale of the food product to ensure safe consumption and customer satisfaction.

CP6034
PROCESS DESIGN AND IMPLEMENTATION

Through the DFST course, students learnt food technology modules such as food preservation, food ingredients, food product development, food engineering and food safety and quality. The aim of this module is to help students integrate this knowledge to design food-processing systems and implement their design through product and process development. In their learning journey, students will have to display working skills at problem solving, planning, team work, reporting and presentation.

CP6035
FOOD PACKAGING

Food packaging plays an essential role in protecting and containing the products we buy until they reach our homes. It also provides us with important product information about nutrition and storage. The module will provide students with the principles and concepts of food packaging knowledge and techniques viz. packaging materials, closures of packages, applications of adhesives in food packaging, packaging technologies. At the end of the course, student should be able to select appropriate materials and technique to develop a food package.

CP6038
BUSINESS DESIGN INFUSED WITH TECHNOLOGY EXPERIENCE (B.I.T.E.) PROGRAMME

Knowledge application from an academic setting into the world of work is often challenging for students. This module will provide an opportunity for them to ease into working life by learning through solving issues in real-life commercial products at the premise of Food Innovation and Resource Centre (FIRC) located at SP. Their knowledge in food preservation, food ingredients, food product development, food engineering and food safety and quality learnt in their first two years in the DFST course will be integrated to conceptualise and develop food products.

CP6042
FUNDAMENTALS OF NUTRITION

Provides students with a basic understanding of the science of nutrition and the importance of nutritional throughout the life cycle, the concept of preventive nutrition and the techniques in performing nutritional assessment.

CP6043
FOOD PROCESSING PRINCIPLES
Food processing plays a critical role in turning raw materials into higher value food products with extended shelf lives, increased variety and enhanced quality. Effective design and management of the various stages of the process requires an intimate understanding of the characteristics of the food materials being processed as well as technologies and engineering concepts underpinning the process. This module provides an introduction to the fundamental knowledge of raw material preparation, mixing operations, material transport, material balance and process control. After completing this and two subsequent modules in Food Preservation and Food Process Engineering, students will be competent to work in the food processing industry.

CP6044
QUALITY ASSURANCE AND STATISTICS
Refer to CP4036

CP6045
FOOD TRENDS AND REGULATIONS
Consumer beliefs and preferences play a crucial role in the types of food being sold in the market. Thus, having an overview of the current food trends in food products, food ingredients and food processing technology is important. In addition, understanding the legal framework and applying them in the governance of food standards in Singapore or selected countries is essential if the product is to be launched as these legislations safeguard the quality and safety of raw and processed food.

CP6046
LABORATORY SKILLS FOR INORGANIC AND ORGANIC CHEMISTRY
Refer to CP4136.

CP6047
ORGANIC CHEMISTRY
Refer to CP4140.

CP6048
INORGANIC CHEMISTRY
Refer to CP4139.

CP6049
ANALYTICAL CHEMISTRY
Refer to CP4138.

CP6050
FOOD PRESERVATION
Food is susceptible to deterioration and spoilage due to the deleterious effects of natural enzymes, microorganisms, pests and the environment (e.g. temperature, air and humidity). Food spoilage can be reduced or prevented by employing certain preservation methods to stabilise and preserve its quality and safety. This module aims to provide students with the knowledge and understanding of how foods can be preserved through these means. Students will learn the basic hands-on skills to operate commonly used food preservation equipment, and learn to be safety conscious when working with the various food-processing equipment.

CP6051
PHYSICAL CHEMISTRY
Refer to CP 4137.

CP6052
LABORATORY SKILLS FOR ANALYTICAL AND PHYSICAL CHEMISTRY
Refer to CP4135.

CP6053
RESEARCH METHODS AND COMMUNICATION
Aims to develop research competency of students in the course. It will equip students with applied scientific research skills to carry out research projects in the industry. In addition, students will learn how to gather and evaluate information, analyse data and draw meaningful conclusions from scientific data.

CP6054
BASIC MICROBIOLOGY
Provides students with an overview and appreciation of the basic microbiology. The topics taught include the prokaryotes, eukaryotes, cell structure and organelles. Students will also learn the taxonomic hierarchy for bacteria, features of yeasts, moulds and life cycle of virus. This module covers the physical and chemical growth requirements for microorganisms and microbial growth. Students will gain practical experience with basic biological lab techniques to use a microscope, stain microscopic specimens, inoculate, isolate, cultivate and enumerate microbial cells. At the end of the module, they will have a strong foundation of microbiology which is needed in their second year Food Microbiology module.

CP7002
NUTRITION
Provides students with a basic understanding of the science of nutrition and the importance of nutritional adequacy and balance for optimal growth and health. The dietary sources of the major nutrients, their digestion, absorption, and metabolism will be covered. Students will learn the functions of nutrients, deficiencies and excesses and their effects on health.

CP7003
INTRODUCTION TO HEALTH AND WELLNESS
Introduces students to the constructs of health and wellness from personal and societal perspectives. The module focuses on personal health and wellness with an emphasis on increasing knowledge and awareness of a wide variety of health-related topics as well as on improving individual health.

CP7004
CELL BIOLOGY, MICROBIOLOGY AND IMMUNOLOGY
Introduces students to the fundamental characteristics and features of living cells and microbes (bacteria, fungi and viruses). The module will cover the structure and function of major cellular components, roles of various types of specialised cells in the human body and the techniques and applications of microbial systems. Students will gain an overview of the cells and tissues of the immune system and their interactions, the importance of inflammation and complement biology.

CP7005
ANATOMY AND PHYSIOLOGY
Introduces students to basic organisation of human anatomy. It covers the anatomical features of various systems and how it relates to physiological mechanisms and associated dysfunctions.

CP7006
FITNESS AND WELLNESS THROUGHOUT THE LIFESPAN
Examines the basis of sports and fitness science. Introduces the various types of physical activities, exercise and sports throughout the human life cycle. This module also investigates the application of exercise science to the promotion and maintenance of health via the prevention of chronic diseases.

CP7009
ORGANIC CHEMISTRY — REACTION MECHANISM
Refer to CP4127.

CP701Y/Z
PROJECT
Enables application and integration of the knowledge and skills acquired throughout the course to solve practical problems involving nutrition, health and wellness. The scope of the project covers review of scientific papers, analyses and interpretation of results. Assessment is by in-course assessment based on a written report and project seminar.

CP7011
INTRODUCTION TO BIOCHEMISTRY
Provides students with a basic understanding of biochemistry. The topics includes introduction to biochemistry, nucleic acids, proteins, enzymes, vitamins and trace elements, carbohydrates, lipids and energy production. Students will be able to appreciate biochemical molecular structures and activities in the human body and how they are regulated to function effectively.

CP7012
APPLIED NUTRITION
Covers the energy and nutrient requirements to support normal growth and development and the various nutrition-related concerns in relation to the human life-cycle. In addition, students will learn about the use of functional foods and nutraceuticals to enhance health. They will also have an overview of nutrigenomics.

CP7013
DIET AND NUTRITION ASSESSMENT
Covers the principles and practicalities of the variety of methods used in assessing food/ nutrient intake and nutritional status. Evaluation of these methods in terms of strengths, limitations and appropriateness for particular populations, individuals, clinical situations and study designs. Exercises will be provided to enable practice in doing nutritional screening, dietary and nutritional assessment of individuals in different situations.

CP7014
HEALTH EDUCATION AND HEALTH PROMOTION
Covers the perspectives of the development of health education and health promotion, health determinants, major theories, and models of health behaviour. A comparison is made between the major concepts and theories of health and characteristics of health education programmes in the community. Application to health education and promotion will be emphasised.

CP7015
EXERCISE PHYSIOLOGY
Provides an introduction to the physiological principles that explain how the human body functions during exercise.

CP7017
NUTRITION AND DISEASE
Emphasises on the relationship between nutrition and human disease processes with special focus on chronic degenerative diseases.

CP7018
HEALTH AND AGEING
Examines from an interdisciplinary perspective, fundamental issues associated with ageing and the complex interaction of physical, nutritional, psychosocial, and environmental issues that influence health and well-being of older adults. The module also provides an overview to the planning, implementation, and evaluation of nutrition and health programmes for the older adult population.

CP7020
CLINICAL NUTRITION
Focuses on the medical nutrition therapy for the sick and metabolically compromised people/patients. A continuation from the nutrition and disease module, this module further explores the core concepts such as underlying nutritional support and medical diseases with illustrative clinical case histories. The module also focuses on covering the principle of evidence based medicine. It allows students to explore the core principles of clinical nutrition and to apply these throughout their training to foster critical thinking.

CP7022
PUBLIC HEALTH AND COMMUNITY NUTRITION
Introduces the role of public health and nutrition at the local, national and international levels. Emphasis is placed on nutrition education, food habits, survey methodology and current topics in the area of public health and community nutrition.

CP7023
SPORTS AND EXERCISE NUTRITION
Allows students to integrate their knowledge of nutritional physiology and biochemistry, and intermediary metabolism with that of exercise physiology. Students can then develop an understanding of the nutritional and practical dietary needs of sports people and athletes. It includes a discussion of different sporting groups and exercise types; macro- and micronutrient requirements; practical dietary considerations in relation to training and competition and current issues and research in sports nutrition.

CP7027
INTERNSHIP
This is a 17-week programme whereby students will be interned to receive relevant training at nutrition, health and wellness companies, institutions and agencies.

CP7028
PHYSICAL FITNESS ASSESSMENT AND EXERCISE PRESCRIPTION
Provides students with an overview and appreciation of the wide spectrum of physical fitness assessment and exercise prescription. The students will learn to apply the knowledge of exercise physiology in the fitness and performance arena to attain general wellness levels and achieve maximum performance in sport or exercise. Students will also be taught the various methods and considerations in prescribing exercise for the general and special populations.

CP7029
BASIC BIOMECHANICS
Gives an introduction to basic biomechanical principles and concepts as applied in the field of sports and exercise science. Students will understand the physics behind human movement as well as calculate human and projectile motion parameters. On completion of this module, students will have an increased awareness and understanding of the applications of basic biomechanics in the playing field.

CP7030
RESEARCH METHODS
Introduces the basic knowledge needed to design and carry out a research project and equips students with the skills needed to evaluate scientific studies. These are important to the students as future practitioners in the field of nutrition, health and wellness where an evidence-based approach is needed in the design and evaluation of health programs. This module will complement the module Final Year Project.

CP7221
INTRODUCTION TO HEALTHCARE INNOVATION AND DESIGN THINKING
Aims to expose students to global and local healthcare context to equip them with a better understanding of the healthcare issues faced by the local society including elderly. Design Thinking mindset and methodology will be introduced to students.

CP722Y/Z
HEALTHCARE INNOVATION PROJECT
Aims to develop our students in multiple skill sets through Design Thinking. Students will develop innovative concepts and project opportunities for preventing illness and improving health including healthcare delivery in institutions and the community. Projects themes include areas in empowering self-care, championing caregivers, and social/ community wellness.

CP7223
ENTREPRENEURSHIP AND PRESENTATION SKILLS
Aims to train students with effective marketing and resources management skills and financial skills to ensure businesses' viability in an increasingly dynamic changing environment world.

CP8501
INORGANIC CHEMISTRY
Aims to provide the essential knowledge and understanding on fundamental principles in the fundamental aspects of inorganic chemistry such as atomic structures, chemical periodicity, chemical bonding and the chemistry of transition metals that will be essential for the understanding of other chemistry disciplines. The practicals will impart essential preparative and analytical skills for inorganic chemicals.

CP8502
ANALYTICAL CHEMISTRY
Aims to provide students with the fundamental knowledge and skills for Analytical Chemistry. On completion of this module, students will have learnt the fundamentals of analytical chemistry which include concepts of common chemical reactions in aqueous medium (such as acid-base neutralisation and oxidation-reduction reactions) and the underlying principle of a typical analytical procedure. They will also be competent to carry out titrimetric analysis and acquire the problem-solving skills of using stoichiometric calculations.

CP8503
CHEMICAL AND BIOSAFETY
Aims to provide students with knowledge on important topics such as risk groups; risk assessment; handling of Biohazardous materials and chemical waste; storage and disposal of biohazards. Laboratory design, safe practices and containment equipment of the four biosafety levels, routes of transmission and decontamination are taught. In addition, students have to examine the implications of local regulations to laboratory operations such as the Workplace Safety and Health Act (WSHA) and the Biological Agents and Toxin Act (BATA).

CP8504
ORGANIC CHEMISTRY
Aims to provide students with the basic knowledge of organic functional groups and be able to apply requisite IUPAC nomenclature rules to name and draw structures of organic compounds. They will also have the ability to generate structural isomers of organic compounds. In addition, students will have developed an understanding of the organic reactions that key functional groups undergo (substitution, addition, condensation, hydrolysis, neutralisation, oxidation and reduction reactions). They will have a qualitative understanding of the physical properties (boiling points and solubilities) of principal organic compounds. They will also acquire the competency skills in crystallisation, melting point analysis and functional groups testing.

CP8505
PHYSICAL CHEMISTRY
Aims to provide students with fundamental understanding on how materials behave and how chemical reactions occur at the molecular and atomic level. Important concepts of physical chemistry such as units and dimensions, fundamentals of gas and solution laws, thermodynamics, equilibrium and electrochemistry are taught with focus on their applications in the chemical industries. Students will acquire the laboratory skills to determine the physical properties of chemicals and their reactions.

CP8506
MICROBIOLOGY
Aims to provide students with basic understanding of microbiology. The methodology used in the study of microorganisms will be taught and reinforced during the practicals for students to acquire bench skills in aseptic techniques. In addition, students will be given an overview of the importance of and use of microbes in the food industry, in treatment of environmental oil spills and bioremediation, geochemical life cycles and human diseases.

CP8507
ENVIRONMENTAL AND WATER TECHNOLOGY
Aims to provide students with the underlying principles and key concepts of environmental and water technology and how these can be applied to the resolution of contemporary global issues such as climate change, environmental degradation, transboundary pollution, species extinction, soil remediation, etc. It enhances a growing environmental awareness towards waste minimisation, environmental impact assessment, industrial health and safety, quality and purification of water. Practical classes will impart to students hands-on laboratory skills and experience relating environmental and water analysis while case studies assignment will develop students' awareness and global perspective of the current developments in environmental and water technology.

CP8508
GOOD LABORATORY PRACTICE AND MANAGEMENT
On completion of this module, individuals will be competent in terms of knowledge and skills in managing an accredited laboratory. He or she will also be trained to maintain the rigour of a quality documentation and technical competency in a testing laboratory. Being conversant with international standard guidelines on good laboratory practices and management, they could work efficiently and effectively in a chemical/biological accredited laboratory.

CP8509
APPLIED STATISTICS AND QUALITY ASSURANCE
Aims to provide an understanding of important concepts of ISO 9000, ISO 14000, quality assurance and the use of statistics in quality control in control charts and experimental design in the chemical manufacturing, life science and service sectors.

CP8510
ORGANIC CHEMISTRY - REACTION MECHANISMS
Aims to give students the fundamental concepts of organic chemistry and its reaction mechanisms. Common reaction mechanisms are taught in detail. Laboratory sessions on organic syntheses and kinetic measurements will reinforce the concepts taught in the lectures. This will provide students with the capability to understand and rationalise the products obtained in terms of reaction pathways.

CP8511
INSTRUMENTAL ANALYSIS
Aims to provide students with practical laboratory skills and theoretical knowledge to perform chemical analysis using analytical instruments such as gas and liquid chromatograph, ultra-violet visible, infra-red spectrophotometer, etc. It provides students with a capability for problem solving, independent thinking and innovation so that they can work effectively in research teams and/or in the industry on life science or chemical analysis.

CP8512
BASIC BIOCHEMISTRY
Aims to provide students with an understanding of the structure of water and biomolecules like proteins, carbohydrates and lipids. The types and functions of enzymes and energy and their roles in cells will be covered.

CP8513
MOLECULAR GENETICS
Aims to provide students with the theoretical knowledge and practical skills in molecular biology and genetic analysis. It also supports the overall course aims of developing problem-solving skills in these areas of knowledge by encouraging students to analyse and solve problems in genetic and molecular biology independently. Students will learn the fundamentals of genetics, function of genes and the concepts and applications of recombinant DNA technology and the tools used in molecular biology.

CP8514
GENERAL ANATOMY AND PHYSIOLOGY
The subject is designed to introduce the structure and function of the various systems and organs of the human body. The students are given an overview of the basic concepts in human physiology in relation to the gross and microscopic anatomical structures of organs and how they function.

CP8515
FORENSIC SCIENCE
Aims to provide students with knowledge on the basic principles and skills for forensic investigations in the chemical and life sciences. The topics covered include chain of custody and crime scene investigation, arson and explosives, DNA and protein analysis of samples from crime scenes and paternity testing, toxic inorganic elements and organic compounds, drugs, food forensic as well as toxicology. Real-life case studies will be introduced into each topic and the students will apply their knowledge to these studies. In addition, the important mind-sets essential by all analysts will be introduced and their implications on the law and judgement in court. Students will also acquire the practical skills to analyse and characterise important chemicals encountered in forensic laboratories.

CP8516
MATERIALS FOR THE MODERN WORLD
Aims to provide broad-based and fundamental knowledge required to understand the conventional and advanced materials, in term of their structures, properties, testing methods, processing methods and applications, so as to enable us to select the right materials to suit different needs.

CP8517
PETROCHEMICALS AND ITS APPLICATIONS
Aims to provide students with laboratory skills and the theoretical knowledge of petrochemicals and its applications. Detailed knowledge of the various processes to convert petrochemicals to basic building blocks followed by their conversion to useful common and specialty chemicals, as well as their importance to Singapore's economy will be taught. In addition, the role of the specialty chemicals derived from petrochemicals will be covered. Students will acquire the essential skills to determine the physical and chemical properties of petroleum products and petrochemicals.

CP8601
LABORATORY SKILLS & TECHNIQUES I
This laboratory-based module provides participants with the analytical and technical skills critical for carrying out different measurements in the chemical laboratory. These skills will be acquired through experiments on weighing, gravimetric and volumetric analysis, where related concepts such as atoms, molecules and stoichiometry, solutions, concentrations, acids, bases and salts will be taught. The module also include measurement of pressure, temperature and pH that are supported by the relevant theories in chemical equilibria, chemical energetics and reaction kinetics.

CP8602
LABORATORY SKILLS & TECHNIQUES II
This module aims to develop in participants the essential skills of observation and deduction necessary for working in the laboratory. These skills will be fostered when participants conduct experiments on qualitative analyses of inorganic and organic compounds. Practical sessions will be imbued with theories in atomic structure, chemical bonding, chemical periodicity, alkaline earth metals, halogens, transition elements, solubility product, as well as functional group reactions and nomenclature in organic chemistry. Participants will be able to build upon the skills and knowledge acquired in this module when they progress to subsequent modules.

CP8603
CHEMICAL & BIOSAFETY
This module aims to provide participants with knowledge on important topics such as safety management of a chemical testing; safety planning; risk assessment; handling of hazards and chemical waste; storage and disposal of hazards; accident reporting, etc. Concepts of biorisk management and biosecurity are also covered. Laboratory design, practices and safety equipment of the four biosafety levels, routes of transmission and decontamination are taught. In addition, participants have to examine the implications of local and international regulations to laboratory operations such as Workplace Safety and Health Act and the Biological Agents and Toxin Act.

CP8604
SYNTHESIS AND SEPARATION TECHNIQUES
The aims of this module are to help participants acquire the skills associated with the syntheses of organic and inorganic compounds, the purification of solids and liquids (recrystallisation, filtration, solvent washing and distillation), as well as the identification of purified compounds (melting point determination and thin layer chromatography). Complementing the practical activities in this module will be essential theories such as chemical bonding, the Valence Shell Electron Pair Repulsion model, polarity, intermolecular forces, solubility equilibria and states of matter. The skills and knowledge attained by participants in this module will serve as a foundation for the acquisition of higher skills and knowledge in subsequent modules.

CP8605
CHROMATOGRAPHY
This module aims to train participants to be competent in applying the theoretical knowledge learnt in separation science as well as demonstrating the mastery of skills in operating chromatography instrumentation by performing compound qualitative and quantitative analyses using various forms of chromatographic techniques such as GC, LC and IE. Complementing the hands-on activities in this module shall be furnished with the learning of operating principles, calibration and optimisation process of each technique. Participants will be able to apply skills and knowledge acquired in this module when they progress to subsequent modules.

CP8606
SPECTROSCOPY
This module aims to train participants to be competent in applying the relevant theoretical knowledge and skills behind spectroscopy in chemistry to analyse contents of compounds through different spectroscopic techniques such as UV/Vis/IR/AAS/AES spectroscopy. Sampling techniques, operating principles, calibration and optimisation processes of each spectroscopic concept will be imbued during the practical session. Moreover, it shall prepare participants well with the ability to take on challenges independently in trouble-shooting and it encourages innovation where they can work effectively as a team in a laboratory. Participants will be able to apply skills and knowledge acquired in this module when they progress to subsequent modules.

CP8607
ENVIRONMENTAL & WATER TECHNOLOGY
This module aims to provide students with the underlying principles and key concepts of environmental and water technology and how these can be applied to the resolution of contemporary global issues such as climate change, environmental degradation, transboundary pollution, species extinction, soil remediation, etc. It enhances a growing environmental awareness towards waste minimisation, environmental impact assessment, industrial health and safety, quality and purification of water. Practical classes will impart students with hands-on laboratory skills relating to environmental and water analyses while case studies assignments will develop students' awareness and global perspective of the current developments in environmental and water technology.

CP8608
GOOD LABORATORY PRACTICES & MANAGEMENT
On completion of this module, participants will be equipped good laboratory practice and quality management skills to work effectively and manage daily laboratory operations. Participants will also develop capability in problem solving of economic and technical aspects of laboratory management so as to better prepare for support of laboratory activities.

CP8609
APPLIED STATISTICS & QUALITY ASSURANCE
This module aims to provide an understanding of important concepts of ISO 9000, ISO 14000, quality assurance and the use of statistics in quality control in control charts and experimental design in the chemical manufacturing, life science and service sectors.

CP8610
ORGANIC CHEMISTRY - REACTION MECHANISMS
The module aims to give students the fundamental concepts of organic chemistry and its reaction mechanisms. Laboratory sessions on organic syntheses and kinetic measurements will reinforce the concepts taught in the lectures. This will provide participants with the capability to understand and rationalise the products obtained in terms of reaction pathways.

CP8611
APPLICATIONS IN LABORATORY ANALYSIS
This laboratory-based module imparts participants with the knowledge and skills on the applications of chromatography and spectroscopy techniques in laboratory analyses. Relevant case studies from different sub-sectors of the chemical industry will be given to the participants where skills acquired on instrumental analyses will be reinforced. The module also covers the design of a project scope where the participants will execute during their On-Job-Training (OJT). Examples of a project scope will range from lab improvement to the optimisation of a lab procedure or work flow.

CP8612
BASIC BIOCHEMISTRY
The module aims to provide participants with an understanding of the structure of water and biomolecules like proteins, carbohydrates and lipids. The types and functions of enzymes and energy and their roles in cells will be covered.

CP8613
ON-JOB-TRAINING
This module aims to equip participants with the competencies, skills and professionalism that are required of a laboratory technician. Participants will apply the knowledge and laboratory techniques that they have acquired to a working environment in the chemical industry. Participants are also required to complete a project which they have proposed in their working environment.

CP8615
FORENSIC CHEMISTRY
The module provides students with laboratory skills and theoretical knowledge of forensic chemistry. It provides participants with the ability to develop problem-solving skills and encourages them to think and learn independently.

CP8616
MATERIALS FOR THE MODERN WORLD
This module aims to provide broad-based and fundamental knowledge in the understanding of conventional and advanced materials, in terms of their structures, properties, testing methods, processing methods and applications, for the selection of the right materials to suit different needs.

CP8617
PETROCHEMICALS & ITS APPLICATIONS
To provide students with the detailed theoretical knowledge of the various processes and the chemistry involved to refine petroleum to basic chemical building blocks, followed by their conversion to some useful common and specialty chemicals. The importance of petrochemicals to the Singapore's economy is discussed. Students will acquire the essential skills to determine the physical and chemical properties of petroleum products and petrochemicals.

CP901Y/Z
APPLICATION SCIENCE
Aims to equip students with basic knowledge in combined science and their applications. The students will learn how chemistry and biology are applied in everyday living. For chemistry, key concepts like moles, energy changes, reduction-oxidation reactions and speed of reaction are taught. They will learn the nomenclature and properties of some organic pollutants. For biology, students will be introduced to basic concepts in biochemistry, microbiology and cellular biology. They will also learn to communicate effectively within a group.

CP9014
PHYSICS
This module aims to provide students with the fundamental concepts and principles in the science of Physics in relation to the field of applied health sciences. It covers an introduction to Measurement, Newtonian Mechanics, Optics, Electricity and Quantum Physics.

CT0012
APPLIED CARDIAC ANATOMY AND PHYSIOLOGY
Aims to provide students with basic understanding of anatomy and physiology of the heart and the clinical relevance of this knowledge.

CT0013
GENERAL CARDIOLOGY AND CARDIAC DISORDERS I
Aims to provide students with definitions, etiologic evaluations, pathophysiology, clinical manifestation, risk factors, treatment, management and complications of various heart diseases.

CT0015
DIAGNOSTIC AND INTERVENTIONAL CARDIAC CATHETERISATION
Aims to provide students an overview of diagnostic and interventional applications of cardiac catheterisation. It looks at history, principles, indications, instrumentation

techniques, equipment use and new developments of percutaneous coronary intervention and valvuloplasty.

CT0016
GENERAL CARDIOLOGY AND CARDIAC DISORDERS II
Covers definitions, etiological evaluations, pathophysiology, clinical manifestation, risk factors, treatment, management and complications of various heart diseases.

CT0017
ECHOCARDIOGRAPHY
Covers information on Conventional and Doppler Echocardiography imaging techniques and illustrations of how they are used in the diagnosis of selected diseases of the heart.

CT0018
ELECTROPHYSIOLOGY AND PACEMAKERS
Covers basic knowledge in identifying arrhythmias, the fundamental concepts of electrophysiology studies and pacing.

CT002Y/Z
CLINICAL ATTACHMENT
Allows students to gain experience in a wide range of cardiology techniques in a hospital or healthcare environment. Professionalism, basic patient care, safety techniques and emergency procedures are emphasised in this attachment.

CT0021
ECG AND RHYTHM DISORDERS
Provides students with fundamental concepts of ECG interpretation and monitoring as related to diagnosis of heart diseases and abnormalities. Also provides understanding of various rhythm abnormalities commonly encountered in clinical practice.

EC1166
DESIGN AND FABRICATION PROJECT
Equips mechatronics and robotics students with the essential design, practical and communication skills and prepares them for their final-year project work. Students will go through the complete design and fabrication process to build an electromechanical device. They will learn to create their designs using Computer-Aided Design software, produce engineering drawings and fabrication procedure worksheets, fabricate and assemble mechanical parts, assemble printed circuit board, test and troubleshoot electronic circuit and finally integrate mechanical and electronic parts to meet the design requirements of the project.

EC1233
CAD (ELECTRONICS)
Introduces students to the use of computers in industrial environment for Computer-Aided Design of electronic circuits, simulation and printed circuit boards, and provides them the hands-on experience in using Electronic Design Automation systems for design of electronic circuits.

EC1405
ELECTRONIC DEVICES
Provides mechatronics students with an appreciation of analogue and digital electronic devices, circuits and applications as used in the Mechatronics area. The module prepares students for Year 3 of the course.

EC1406
CIRCUIT THEORY
Builds on the fundamentals covered in the Electrical Technology module and aims to provide students with the understanding and application of advanced theorems to solve complex electrical circuits efficiently. Basics on three-phase systems are also covered as an introduction to the third-year course.

EC1408
ELECTROMECHANICAL DEVICES
Introduces electric motors used to convert electrical power into mechanical power. Covers concepts of electromagnetism, AC power, power triangle, significance of power factor and power factor correction. Discuss operation principles of common types of stepper, DC and AC motors. Outline measurement concepts of AC electrical power, DC electrical power and mechanical power.

EE9119
ENGINEERING MANAGEMENT
Introduces students to the engineering economy in relation to the time value of money. Teaches the significance of economic aspects of engineering, how to evaluate the feasibility of new engineering project and replacement projects in terms of cost and benefit using the different measure of worth namely Present Worth, Future Worth, Annual Worth, Payback analysis and Rate of Return. Components of Cost of Capital and Capital budgeting will be taught. Differences in private and public projects and buy versus lease options are discussed. Case studies will be used to help students understand and grasp these concepts. Students will learn to use the spreadsheet to perform the financial calculations.

ET0010
COMPUTER NETWORKING
Provides students with an understanding of network fundamentals and computer network routing principles. Students will learn the difference between routing and routed protocols and to configure routers for LAN communications. Students will also be equipped with network troubleshooting skills and able to discuss LAN design issues involving multiple routers upon completion of the module.

ET0011
COMPUTER INTERFACING
Demonstrates how a personal computer can be used in interfacing applications using its internal ports (i.e. Parallel, Serial RS-232 and USB) as well as external ports using interface cards. Students are introduced to parallel, serial and USB data transfer and taught how to control electronic devices and gather information from the real world.

ET0015
SERVER MANAGEMENT
Introduces students to the principles, concepts and techniques in managing servers. Upon successful completion of this module, students should be able to understand how to install servers and manage users over a network; avoid problems through fault tolerance; recover from problems through disaster recovery; troubleshoot network/server problems; evaluate and select the appropriate tools to manage the network with emphasis on server management and administration.

ET0023
OPERATING SYSTEMS
Introduces students to the operating systems (OS) of computers. It provides a clear description of the concepts that underlie operating systems. At the end of this module, students will have a good understanding of the OS's management system such as processes, memory, storage, I/O devices and security issues.

ET0026
NETWORK MANAGEMENT
Teaches students the essentials of network management including network management functions, protocols and standards. It explains how network management functions are achieved through a practical approach. It gives students an overview of network management tools currently available so that students can relate to them as they are deployed in an organisation. This module also covers ways of optimising network performance through traffic distribution and quality of service.

ET0030
TCP/IP
Provides students with an understanding of the underlying concepts essential to the protocols of the Transmission Control Protocol/Internet Protocol (TCP/IP) suite, which is the engine for the Internet and networks worldwide. It also covers popular TCP/IP application protocols (such as HTTP, FTP, SMTP, DNS, etc) and introduces students to the latest IP addressing standards used in networking.

ET0048
SYSTEMS AND CONTROL
Equips student with basic knowledge and skills in understanding the dynamics of control systems and processes. It covers basic concepts of control theory in continuous and discrete aspects. Topics to be covered include systems characteristics, transient response analysis, s-plane analysis, modes of control, stability analysis, discrete system and control implementation and applications. This will enable students to gain knowledge and skills on industrial control systems and devices, and provide the foundation to understand more advanced control techniques and systems.

ET0049
SENSORS AND INSTRUMENTATION
Provides students with an adequate knowledge and basic foundation in understanding the principle and application of sensors and transducers in automation and process industry. Various types of sensors and transducers for process measurement, automation and control will be covered including signal conditioning techniques. This module covers topics on basic instrumentation, sensors and transducers, process instrumentation, principle and working of general electrical measuring instruments, signal conditioning techniques and advanced instrumentation topic covering wireless sensors and virtual instrumentation. The module also covers principles of data acquisition and towards the end students will be able to design a complete general instrumentation system.

ET0050
ELECTRICAL INSTALLATION DESIGN
Covers the basic knowledge and practical skills in the application and safe use of electrical energy and services in domestic, commercial and industrial buildings. The main topics to be covered include an overview of the power generation, transmission and distribution system, electrical safety and protection principles, analyse and design electrical systems based on the relevant codes of practices, and the principles on the testing and troubleshooting of electrical installation circuits. Novel technology in electrical installation, such as the KNX system, will also be covered.

ET0053
CIRCUIT THEORY AND ANALYSIS
Provides students with an understanding of circuit theory, which includes mesh analysis, nodal analysis, circuit theorems and applications. The students will also be introduced to three-phase circuits, covering three-phase supply and loads.

ET0064
POWER ELECTRONICS AND DRIVES
This module aims at educating and training student in the use of power semiconductor devices in conversion and control of electrical power with special emphasis on electrical drives. Students will be introduced to the latest developments and techniques in power electronic so that they will acquire the required skill to meet the need of electrical and electronics engineering industries in Singapore and other countries in the region.

ET0083
STRUCTURED PROGRAMMING
Teaches students to write programs in a structured way. It emphasises good programming techniques and covers topics such as simple data types, input/output, selection control and loop-constructs, functions and basic data structures such as arrays.

ET0085
CADD
Equips students with the knowledge of drawing office practice, ISO drawing standards and drawing skills using latest AutoCAD software and the ability to read and produce good technical sketches and projection drawings as a form of engineering communication. The module will cover basic 2D drawings, isometrics and orthogonal projections, and the use of workstation based CAD/CAM software for computer-aided drafting.

ET0087
ANALOGUE COMMUNICATION SYSTEMS
Introduces principles and techniques used in analogue communication systems. A systems approach is used, with the main emphasis being on the understanding of principles. Topics include signals and their spectrums, filters, band-limiting, noise sources, SNR, radiated and conducted interference, need for EMC compliance, noise reduction, necessity of modulation, AM, DSBSC, SSB, FM and basic operation of superhet radio receivers.

ET0096
DIGITAL SIGNAL PROCESSING
Provides students with an understanding of digital processing of signals and their implementation in digital signal processing systems. Topics that will be covered include sampling and quantisation, impulse response, discrete linear convolution, analysis using z-transform, design of FIR digital filters, discrete and fast Fourier transform, and practical implementation of digital signal processors.

ET0097
DIGITAL COMMUNICATIONS
Teaches the principles and techniques used in digital communication systems. Topics covered include signal analysis, digital pulse modulation (PCM, DPCM), digital modulation (ASK, FSK, PSK), transmission problems such as ISI, AWGN, BER and eye diagram, detection techniques, information theory and coding.

ET0099
IC TESTING
Provides students with the knowledge of Automated Test Systems and the various techniques used for testing digital devices, memory devices and loaded Printed Circuit Boards (PCB). Students will also acquire skills in writing test programs for component testing. This module also supports the overall course aim of equipping students with the relevant knowledge, concepts and skills required in an electronic manufacturing environment.

ET0100
QUALITY AND RELIABILITY
Provides fundamental knowledge in quality and reliability from product design to manufacturing, including topics like Quality Concepts, Statistical Distribution and Analysis of accuracy, precision and tail areas, SQC, SPC, Control charts, Reliability Concepts of MTTR/MTBF, Failure Rates, Availability, Maintainability and System Reliability. Students will also learn the use of software like Statgraphics for analysis. There will be assignments on TQM, ISO9000, Six Sigma, Accelerated Testing and Environmental Stress Testing.

ET0101
IC DESIGN
Provides students with fundamental knowledge in Integrated Circuits Design and practice in using the appropriate techniques in designing integrated electronic circuitry using CAD tools.

ET0102
WAFER FABRICATION
Provides students with knowledge and understanding of wafer fabrication technology. It will include semiconductor physics, wafer fabrication processes, integrated circuit devices, clean room management, ultra pure water production and vacuum systems technology.

ET0104
EMBEDDED COMPUTER SYSTEMS
Provides an understanding of low-cost, small-sized and powerful embedded processors used commonly in industrial and home devices. Students will learn to develop smart devices with graphical and real time multitasking functions. Topics covered include computer architecture, interfacing to commonly used devices, graphic displays, analogue to digital conversion, timing functions, and UML design.

ET0130
NETWORKS AND PROTOCOLS
Introduces the concepts of computer networking and internetworking. The students will learn about TCP/IP Reference Model, IP Addresses assignment, network planning and design concepts, routing, channel access techniques and IEEE Standards. Various LANs (e.g. Ethernet and Token Ring) and WANs (e.g. Internet, POTS, ISDN, X.25, Frame Relay, PPP, ATM) technologies are also covered. Students will learn how to configure VLANs on switches, NAT and Access Control Lists in routers.

ET0141
BROADBAND COMMUNICATIONS
Provides students with a basic understanding of various broadband networks and services. Topics include MPLS, ATM, Gigabit Ethernet, SONET, Broadband access technologies (xDSL, Cable Modem),WiMAX, FTTH and other emerging broadband technologies. Students will learn to configure networking devices like switches, routers, and DSLAM to study the behaviour and application of broadband network.

ET0153
SATELLITE AND OPTICAL COMMUNICATION
Covers both theoretical and practical aspects of optical and satellite communications. Topics covered in Optical Communication include light wave propagation in optical fibres, main devices used in optical communication link (Laser diode, LED and photodiodes), and link budget analysis. Topics covered in Satellite Communication include subsystems in satellite and earth stations, satellite communication applications and system budgeting.

ET0163
SYSTEMS AND CONTROL
Provides students with an understanding of the basic concepts of control theory in time and frequency domain. Topics to be covered include systems characteristics, modelling, transient and frequency response analysis, s-plane analysis, modes of control and system stability analysis.

ET0164
AVIONIC SYSTEMS
This Year 3 module is taught in the Diploma in Aeronautical Engineering (DARE) programme and is based on Singapore Airworthiness Requirements (SAR) 66. Topics taught include modern aircraft instruments and displays; computer-controlled monitoring, detection and warning systems; voice and flight recordings and radio and satellite communication and navigation systems. The practical sessions train the students to be technically sound with their hand skills. The assignments are designed to instill the importance of good communication, independence, creativity, team spirit, life-long learning as well as the applications of the knowledge and skills they have learnt in this and other modules.

ET0172
INTERACTION DESIGN TECHNOLOGY I
Equips students with the understanding and ability to prototype Graphical User Interfaces (GUI) that include simple programming logic. Students will learn how to use a graphical scripting-based software development tool (e.g. Macromedia Flash/ActionScript) to design and develop simple interactive applications. Knowledge and skills acquired will support and be applied to the design studio projects. Students who master this module will be able to prototype simple interactive applications such as interactive greeting cards and simple games on personal computers that operate on standard I/O devices (mouse, keyboard and monitor).

ET0173
INTERACTION DESIGN TECHNOLOGY II
Equips students with the understanding and ability to prototype simple solutions that enable personal interactions with stand-alone devices, i.e. interface building between a single user and an existing device. Students will learn how to develop GUI-based programs using a structured programming language (e.g. Java, Visual Basic .NET) and how to program a computer system to interface with the physical world via sensors and effectors using tools (e.g. Lego Mindstorms, National Instruments LabView). Knowledge and skills acquired will be applied to support the Design studio projects. Students who excel in this module will be able to prototype stand-alone interactive applications such as interactive digital museum/art exhibits and simple stand-alone robots that interface with the physical world via input and output technologies such as sensors and motors.

ET0174
INTERACTION DESIGN TECHNOLOGY III
Equips students with the understanding and ability to prototype solutions that interact with complex and networked systems/ environments, i.e. interface building between a single user or group of users and new devices/ environments. Students will learn how to build simple connected systems and operate them as a whole (via a network, Internet). They will be exposed to relevant wireless technologies (e.g. handphones, SMS, Wi-Fi) and wired technologies (e.g. Ethernet, ADSL) that can be used to provide connectivity to their solutions. Knowledge and skills acquired will support and be applied to the Design studio projects. Students who master this module will be able to prototype fairly complex connected interactive applications such as SMS alerts for queue numbers at the polyclinic and simple innovative multi-player game using Wi-Fi.

ET0176
AIRCRAFT ELECTRICAL AND INSTRUMENT SYSTEMS
Introduces the electrical power supplies and instruments on the aircraft according to the SARR 66 requirements. It covers the battery power supply and operation principles of AC and DC generators and motor on the aircraft. The syllabus also provides fundamental knowledge on the operation of various flight instruments that display navigation and engine parameters. The working principles of pilot-static and gyroscope systems and their related flight instruments will be covered. Knowledge on flight navigation using direct and remote-indicating compasses under various electromagnetic environments will be imparted to the students.

ET0180
BIOMEDICAL EQUIPMENT & PRACTICES

Familiarises students with equipment used in the Operating Room, Intensive Care Unit, Radiotherapy, Cardiology.Neurology, Physiotherapy, Rehabilitation'departments and Clinical Laboratory. A brief explanation of the circuits as well as the mechanical and biochemical parameters involved in the measurements is included. Students will learn medical equipment characteristics, the nature of data measured and the general concept of equipment design and good equipment handling practices. Commissioning, installation, preventive maintenance, and testing of biomedical equipment will be covered in the practical sessions.

ET0181
FUNDAMENTALS OF INNOVATION DEVELOPMENT

Provides a platform to teach students design thinking skills and an attitude for creativity in conceiving new products. Students are also expected to harness their innate curiosity and ability to create through design-and-make activities and develop the quality of tenacity through continuous refinement of their ideas towards a viable solution within a given timeframe. Working in a group, they should also exercise judgments of an aesthetic, technical and economic nature.

ET0244
BIOMEDICAL EQUIPMENT AND PRACTICES

Enables students to familiarise with medical tools and equipment used in medical and rehabilitation engineering departments. The use of equipment used in the Operating Room, Intensive Care Unit, Radiotherapy, Cardiology and Neurology sections, as well as physiotherapy and rehabilitation departments will be covered in the module. A brief overview of laboratory equipment and explanation on circuits, mechanical biochemical parameters involved in the measurement s will be provided. Students will learn the nature of biological information measured by these systems. The common medical equipment characteristics, the nature of data measured and the general concept of equipment design will be discussed.

ET0245
NETWORK SECURITY

Provides students with the fundamental concepts underlying the need for Network security. Students will be able to identify the threats and vulnerabilities of computer systems and networks and recommend the appropriate actions to be taken to counter-act such activities.

ET0246
WIRELESS NETWORK AND SECURITY

Provides students with a complete foundation in Wireless Networking. It covers from basic RF theory, hardware installation, configuration and management, to troubleshooting, security and site surveying. In addition to that, students will be taught wireless security concepts and how to prevent undesirable users from entering the access point.

ET0247
FIREWALL AND INTRUSION PREVENTION

Provides the participants with a guide to the most popular firewall technology implementations. In addition, with the knowledge gained from this module, students would be able to recommend and implement the necessary security solutions.

ET0248
NETWORK ANALYSIS AND FORENSICS

Teaches the use of Network Analysis and Packet Capture tools to analyse data flowing through a network. Students will learn to use analysis tools to perform forensic test to determine the nature of any security breaches and exploits. The module will also use case studies to determine the nature of different exploits used by hackers on the Internet.

ET0249
PROJECT

Students will be given an opportunity to plan and design a network. This project will be based on the knowledge and skills gained from their course of study. Students will also learn to integrate the knowledge from their course into a practical application in ensuring the security of the network.

ET030Z
PROJECT OR DISSERTATION

Educates students to apply knowledge to practical problem-solving. Students who are sponsored by companies are encouraged to seek industry-sponsored projects related to problems found in their working environment and submit a report on it. Alternatively, students can choose to write a dissertation on a topic or subject approved by the course coordinator. Project Management tools will be included as an e-learning component.

ET0301
COMPUTER PROGRAMMING WITH APPLICATIONS

Provides students with the skills and knowledge to develop and implement well-structured and robust programs using a visual programming language. Students will learn the concepts of objects and object properties, as well as object methods in an event-driven programming environment. Case studies and practical examples covering a wide range of applications in computer interfacing, internet interactivity, office automation enhancements, data and network communications will be used to add interest and context for programming in the real world.

ET0313
INTELLIGENT INSTRUMENTATION AND MEASUREMENT SYSTEMS

Provides students with a comprehensive coverage of the area of instrumentation and measurement systems, with an emphasis on computer-based modern instrumentation systems. In addition to the traditional areas of instrumentation like sensors and transducers, controllers and control valves and signal conditioning and recorders, this module will also cover some major developments in intelligent instrumentation including GPIB interfaced instruments, discrete signal conditioning and data conversion board and bus-based instruments.

ET0314
AUTOMATION AND PROGRAMMABLE CONTROLLER APPLICATION

Introduces the basic concepts and latest development in programmable controller technologies used in automation applications. Topics include structure of PLC, ladder diagram programming, control system design, advanced instruction sets, intelligent I/O modules, local area networks, supervisory control, and data acquisition in PLC systems.

ET0315
DIGITAL AND ADVANCED CONTROL

Teaches modern control theories and the role of digital computers in process control systems. Topics include sampled data control, direct digital control, supervisory control, state space method, multivariable, optimal, stochastic and adaptive systems.

ET0316
PROCESS CONTROL ENGINEERING

Provides an integrated system approach to the understanding of process control systems behaviour. Operation and behaviour of practical process control systems are emphasised. Topics include controller characteristics, dynamic behaviour of process control loops, multi-loop control and non-linear system.

ET0321
POWER SEMICONDUCTOR DEVICES AND CONVERTER TECHNOLOGY
This module introduces students to the overview of the main characteristics, protection and drive circuit concepts for power semiconductor devices such as power diodes, thyristors, BJT, power MOSFET and IGBT. The students will also learn advanced concepts of naturally and self-commuted converters such as phase controlled converters, choppers and inverters.

ET0322
POWER SUPPLY APPLICATIONS OF CONVERTERS
Introduces students to the various types of power supplies for industrial and utility applications. Optimising of the interface with power electronic systems will also be covered.

ET0324
DIGITAL CONTROL OF DRIVES
Gives students strong foundation in microprocessor systems that are used to control AC industrial drives. The module will describe basic digital control algorithms used in AC drive systems. The various stages in the design of digitally controlled drives will be explained. The topics will cover the basic principles of digital control systems, Z-transforms, digital control systems hardware, microprocessor based AC drive.

ET0423
AIRCRAFT ELECTRICAL FUNDAMENTALS
This module covers the fundamentals of electricity generation and the different types of DC sources, particularly the primary and secondary cells of aircraft batteries such as lead acid batteries and nickel cadmium batteries. DC motor and generator constructions and operation principles will also be covered. Topics on 3-phase AC principles, transformers and its principles of operations under load and no-load conditions will be taught. After covering the fundamentals, the module introduces students to topics such as landing gears operations, aircraft ignition and heating systems. To keep students current with modern aircrafts, they also taught the generation and use of electricity in the Boeing 787 aircraft.

ET0424
AIRCRAFT RADIO AND OPTICAL COMMUNICATIONS
Provides a good engineering foundation for the students in radio theory, covering topics on propagation of radio wave, polarisation, radiation pattern, transmitter, receiver, modulator, RF power amplifier, filters and tuned circuits. Also taught in this module are the principles and methods for minimising the effect of conducted and radiated electromagnetic interference; methods used to minimise the effects of lightning strikes and static on aerials; and type of aerials and feeders. Basics of fibre optic data transmission, multiplexing circuits and audio systems will also be covered.

ET0425
AIRCRAFT INSTRUMENT SYSTEMS
Provides a good understanding of terminologies and basic concepts of aircraft instrument devices and systems such as altimeters, vertical speed indicators, mach meters and other measuring and indicating systems. The module will also cover the working principles of aircraft systems such as pilot-static systems, gyroscopic systems, compass systems, air-data systems and electronic display systems such as EFIS, EICAS and ECAM. The operation of digital data buses in aircraft systems such as ARINC and other specifications will also be covered.

ET0426
AIRCRAFT COMMUNICATION AND NAVIGATION SYSTEMS
This module covers topics related to the aerospace industry. The topics include the aircraft emergency locator transmitter, VHF/HF communications systems, VOR/ILS systems, Doppler navigation system, microwave landing system, automatic direction finding system, area navigation, global position system (GPS), traffic alert and collision avoidance system (TCAS), flight management systems, and weather avoidance radar and radio altimeter.

ET0427
AIRCRAFT AUTOMATIC FLIGHT AND ELECTRONIC SYSTEMS
Covers the working principles and functions of automatic flight control systems, autopilot navigations, automatic landing systems, inertial navigation systems, and safety and warning systems such as ground proximity warning systems and instrument warning systems. Other areas include on-board maintenance systems, fuel quantity, temperature, vibration measurement systems and engine indicating systems.

ET0428
AIRCRAFT ELECTRICAL SYSTEMS
Covers the fundamental principles of the network of components that generate, transmit, distribute, utilise and store electrical energy in aircraft. These include single and multi-phase AC and DC power generators and motors, battery systems, electrical power converters, conditioners and protections, aircraft flight controller systems including fly-by-wire systems, aircraft internal and external lightings, ice and rain protection systems, aircraft fire protection and extinguishing systems. The module also informs students on lightning protection, electrostatic protection and electrical bonding techniques used in aircraft.

ET0429
AIRCRAFT SERVOMECHANISMS AND ELECTRONICS
Provides students with the basics in electronics and servomechanism components that serve as building blocks for aircraft control systems. These building blocks will be used to introduce feedback control system concepts and terminologies to students. Upon completion of this module, the students should be able to understand the elements of aircraft servomechanisms, their functions and performance.

ET0430
AIRCRAFT SYSTEMS PROJECT
Equips students with hands-on knowledge on the avionics and mechanical aircraft maintenance practices. The avionics maintenance section requires an understanding of wiring and schematic diagrams, troubleshooting of electrical circuits, performing wire routing, crimping of pins, sockets, terminal lugs and butt splices, and soldering and wire locking. The mechanical aircraft maintenance trains the students on torque loading, riveting, tensioning of turnbuckles and working on sheet metal piece. The skills of using aircraft maintenance and measuring tools will also be imparted and assignments will be given to assess the aircraft maintenance skills of the students.

ET0433
HUMAN FACTORS
This module highlights the importance and need for human factors training in aircraft maintenance and inspection. It discusses the influence of human behavior and performance on safety and efficiency, and how human factors can be optimised through a systematic application of human sciences, integrated within the framework of systems engineering.

ET0513
DATA COMMUNICATION SYSTEMS
Provides an introduction to data communications and an understanding of concepts and techniques used in the transfer of information. Topics include data transmission basics, synchronous and asynchronous transmission, transmission media, data communication systems and devices, as well as an introduction to networks.

ET0521
NETWORK VULNERABILITIES AND SECURITY TOOLS
Provides students with the basic and ethical hacking skills to identify major types of system and network vulnerabilities. Students will also be taught countermeasures against these threats through the use of security tools and best practices used to mitigate the effect of attacks and malicious codes.

ET0522
NETWORK SECURITY SYSTEMS
Teaches students the security protocols and techniques in securing data transmission, such as Symmetric and Asymmetric Cryptography, PKI system, PGP, S/MIME and user authentication systems. The students also learn about security in network devices and server systems. Topics covered include Secure Socket Layer (SSL)/ Transport Layer Security (TLS), HTTPS protocol, Secure File Transfer Protocol, and security baseline practices for server systems. Students will gain hands-on experience in securing web servers, setting up RADIUS server for authentication, and securing wireless network using techniques like WEP, WPA and PEAP.

ET0524
MOBILE COMMUNICATION SYSTEMS
This module covers the fundamentals of mobile communications, including signals and signal transmission, radio transmission and propagation, multiple access, and digital modulation techniques. It also covers the architecture and operation of GSM (2G), UMTS (3G), LTE (4G) mobile communication systems, and Fixed-mobile convergence.

ET0525
MOBILE APPLICATIONS DEVELOPMENT
Provides students with the skills to develop and implement games or applications for mobile phones. Students will be introduced to open-source software tools available for programme development, key concepts in mobile programming, user-interface classes, sensors and local data storage. By the end of the module, students should be able to conceptualise and fully develop a mobile application.

ET0529
MOBILE APPLICATIONS DEVELOPMENT
Provides students with the skills and knowledge to develop and implement games or applications that can run on mobile phones. Students will be introduced to open-source software tools available for programme development, key concepts in mobile programming, user-interface classes, sensors and local data storage. By the end of the module, students should be able to conceptualise and complete a mobile game or application.

ET0531
FIREWALL TECHNOLOGIES
This module covers secure network design and the technologies for securing the perimeter of a network. Security features of perimeter devices (routers and firewalls) including various filtering techniques (e.g. packet filtering, Proxy filtering and Stateful filtering) are covered. Other topics include virtual private network, intrusion detection and prevention, disaster recovery and business continuity. Students will also learn in the laboratory session how to configure Cisco routers and ASA (Adaptive Security Appliance) for De-Militarised Zone, Virtual Private Network, and authorisation.

ET0532
IP MULTIMEDIA SERVICES
Provides students with the fundamental concepts of Voice over IP applications. IP Telephony and IPTV architectures and components used will be covered. Students will learn to install, configure and maintain Enterprise IP Telephony network. Service provider VoIP solutions will also be covered. For IPTV, students will learn to configure video streaming server and multicast transmission.

ET0533
DIGITAL MEDIA CODING
Aims to provide students with knowledge of the characteristics of multimedia signals and equip them with the understanding of the concept of image, video and audio compression and their applications.

ET0603
BIOMEDICAL INSTRUMENTATION
Introduces the principles and concepts of biomedical instrumentation. Theory and application of sensors, biosensors, transducers, bio-potential electrodes, measurements of bio-potential signals including electrocardiogram (ECG), electroencephalogram (EEG) and electromyogram (EMG) are taught. Other topics covered include basic circuit laws, use of operational amplifiers, instrumentation amplifiers and filters in biomedical instruments; principles of various monitoring systems such as respiration and cardiovascular systems.

ET0607
ANATOMY AND PHYSIOLOGY
Provides students with the knowledge of structural levels in the human body and the physiological processes of the major organ systems. The gross anatomy of major organs is taught so that students can correlate structure with function. The physiology of major organs is taught in order for students to appreciate the working of the human body. Anatomy and physiology is used as a basis for the biomedical applications of clinical, histological and pathological conditions. The students will experiment with 'in vivo' signals of major organ systems to understand the diagnostic and therapeutic features.

ET0608
BIOMEDICAL INSTRUMENTATION DESIGN AND APPLICATIONS
Introduces the principles and concepts of biomedical electronics. Theory and application of biosensors, bio-potential electrodes, measurements of bio-potential signals including electrocardiogram (ECG), electroencephalogram (EEG), and electromyogram (EMG) will be taught. Use of operational amplifiers, instrumentation amplifiers and filters in the context of biomedical instruments will be discussed. Principles of various monitoring systems such as respiration and cardiovascular systems will be introduced. Computerised biomedical instrumentation will also be covered in this module.

ET0609
BIOMEDICAL SIGNAL PROCESSING AND ANALYSIS
Provides an understanding of signal processing and analysis used in biomedical applications. Topics will cover data acquisition and digital signal processing (DSP) principles such as sampling, quantisation coding, Z-transform, FIR filtering and DFT. Practical experiments will include digitising, processing, analysing and presenting bio-signals such as ECG, EEG, EMG and EOG, and other 'in vivo' signals.

ET0610
BIOMEDICAL EQUIPMENT AND PRACTICES
The objective of this module is to familiarise the students with medical tools and equipment frequently used in medical departments. Some equipment used in Operating Room, Intensive Care Unit, Cardiology, Neurology sections, clinical laboratory, physiotherapy department, rehabilitation department will be covered. In this module, students will learn the nature of biological information measured by these equipment. A brief explanation of circuits, mechanical and biochemical parameters involved in the measurements will be explained. Students will learn about the common medical equipment characteristics, the nature of data measured and the general concept of designing equipment and equipment maintenance practices will be discussed. Commissioning, installation, preventive maintenance, and testing of biomedical equipment will be covered in the practical sessions.

ET0612
MEDICAL INFORMATICS AND TELEMEDICINE
Provides students with the knowledge of various types of information systems in the hospital environment and also the various medical information standards. Students also learn the concepts of data mining and apply these concepts in medical informatics. Other topics include the introduction to medical telemetry systems and telemedicine concepts.

ET0614
MEDICAL IMAGING AND IMAGE PROCESSING
Fundamentals of medical imaging and different imaging modalities will be explained. Acquisition, processing, reconstruction and archiving of medical and radiological images require understanding of the concepts and knowledge of the systems operation. Principles of X-ray, tomography, ultrasound, magnetic resonance, and other new imaging modalities will be covered. Students will learn the fundamentals of image processing and how to enhance the diagnostic features in those images. Students will also learn 3D modelling using CT, MRI images and create prototypes using Rapid Prototyping tool to make models that are used by surgeons and clinicians.

ET0702
DATA STRUCTURES AND ALGORITHMS
Provides a basic theoretical understanding and practice in data structures and algorithms commonly encountered in computer programming. Students will receive further understanding in basic data types and be introduced to the construction and operations of more complex data types and structures beyond their first programming module. Basic principles and reasoning of algorithms and methods commonly encountered will be introduced. Constructions and associated operations of linked lists, stacks, queues and binary trees will be covered. Simple applications will be introduced through the use of some STL classes associated with common data structures and algorithms.

ET0706
OBJECT-ORIENTED PROGRAMMING
Equips students with knowledge of basic object-oriented programming concepts. Students will be able to develop software with modularity and reusability using object-oriented approach, event-driven programming with GUI, and design more robust application program using exception handling.

ET0708
MICROPROCESSOR SYSTEMS & PROGRAMMING
Provides students with knowledge of how microprocessors work and are operated. Topics include the computer architecture, memory interfacing, device interfacing, peripheral support and development of microprocessor systems.

ET0709
NETWORK ANALYSIS AND FORENSICS
Teaches the use of Network Analysis and Packet Capture tools to analyse data flowing through a network. Students will learn how to use analysis tools to perform forensic tests to determine the nature of any security breaches and exploits. The module will also use case studies to determine the nature of different exploits used by hackers on the Internet.

ET0714
DATA CENTRE MANAGEMENT
This module looks at the use, planning and configuration of resources and devices that make up a Data Centre. Students are taught how to manage, monitor and conserve energy using Green Information Technology (IT) methodologies.

ET0715
INTERNET SECURITY
Provides students with the fundamental concepts on the need for IT Security. The world is awakening to the fact that even though network and OS-level security might be tightly configured, the application layer still provides a potential avenue of entry for intruders. Students will be able to identify the vulnerabilities of web applications and recommend appropriate actions to be taken to counter-act and improve web application security.

ET0716
LAN SWITCHING AND WIRELESS
Provides students with a complete foundation in Wireless Networking and LAN Switching. Wireless Networking covers basic RF theory, hardware installation, configuration and management, troubleshooting, security, and site surveying. LAN Switching covers basic switch concepts and configuration, virtual LANs, VLAN protocols and Inter-VLAN Routing.

ET0718
WIDE AREA NETWORKS
Discusses the WAN technologies and network services required in enterprise networks. This module demonstrates how to select appropriate devices and technologies to connect small- to medium-sized business networks. Students learn how to implement and configure common data link protocols and how to apply WAN security concepts, principles of traffic access control and addressing services. Students will also learn how to detect, troubleshoot, and correct common enterprise network failure issues.

ET0719
SYSTEM VIRTUALISATION
Introduces the concepts and techniques of implementing CPU and data storage virtualisation in an effort to maximise the resource utilisation and to conserve energy. Practical implementation is used to illustrate concepts taught.

ET0720
ADVANCED MICROCONTROLLER TECHNOLOGY
To provide students with knowledge and understanding of low-cost and small-sized but powerful embedded systems, used commonly for industrial and home devices. Students will explore the interfacing using both C Language and Assembly Language. The practical use of such systems is shown by how the Internet is used to control and monitor common devices.

ET0721
CLIENT-SERVER APPLICATIONS DEVELOPMENT
Aims to teach students the basic features of the client and server side programming. Students will also learn practical skills in database programming using Structured Query Language (SQL). Students will develop a professional client/server application over the Web and/or mobile devices for Internet applications.

ET0722
CLOUD COMPUTING SERVICES
Teaches students the basic principles of Cloud Computing differentiating the use of cloud systems, identification of potential benefits and risks as well as the ability to evaluate the basic offerings of cloud systems. The student will learn about the technologies and framework that support cloud computing and how to examine and recommend applications for the cloud.

ET0723
MOBILE COMMUNICATIONS
This module covers the fundamentals of mobile communications, including signals and signal transmission, modulation techniques, cellular concept and multiple access techniques. It also covers the architecture and operation of GSM (2G), UMTS (3G) and LTE (4G).

ET0727
CCNA STUDIES
The CCNA is recognized in the industry as a technical professional working with traditional Cisco-based networks that predominantly include LAN and WAN routers and LAN switches. The module is designed to help students acquire the knowledge to install, configure and operate Local Area Network (LAN), Wide Area Network (WAN) as well as routing and switching implementations and management as proposed by the CCNA certification. Students who complete this module will have the expertise needed to pass the industrial certification test CCNA, by Cisco Systems.

ET0728
LINUX ESSENTIALS
This module introduces the student to the Linux Operating Systems. Students will learn to be effective users of a Linux system, focusing on basic Linux skills, such as using the command line, editing text files, managing users and groups, managing filesystem and process.

ET0729
LINUX SYSTEM ADMINISTRATION
This module introduces the student to the enterprise Linux Operating Systems administration. Students learn to be effective administrators of Linux systems by mastering basic Linux System Administration tasks, including in-depth coverage of file systems, partitioning of logical volumes, system services configuration, security and troubleshooting. This module also focuses on extending the basic command-line skill which are invaluable for enterprise level Linux administration.

ET0730
NETWORK FUNDAMENTALS
This module provides a general overview of computer networking. It provides a general introduction to networking terminology, concepts, devices, functionality, applications and standards required for computer networking. Students will learn to build simple LANs, perform basic network and service configurations, and implement IP addressing schemes.

ET0731
INTERNET OF THINGS (IOT) SECURITY
Students will learn the prime requirements for a secured IoT-setup. The module will provide a complete exposure to security concerns of an IoT setup by uncovering the present challenges in standardization of data routing, data integrity, device supervision, IoT Integration, information storage, IoT performance, and security solutions. This module will also provide students with practical activities to implement performance and security requirements for a secured IoT setup.

ET0732
MACHINE LEARNING & ARTIFICIAL INTELLIGENCE
This module aims to equip students with understanding of machine learning and artificial intelligence. It will cover the theory of machine learning and artificial intelligence, and their potential applications. Students will learn about machine learning methods and tools. They will then apply the knowledge through hands-on experience in building machine learning system in mini projects.

ET0907
NETWORK CONTROL APPLICATIONS
Provides students with relevant skills required to design network control applications in automation and process system. The module introduces networking basics including OSI 7 layers, TCP/IP model, IP addressing, network implementation, routing and Ethernet switching. Control topics covered in the module include PLC design, SCADA monitoring, Devicenet in CAN, control gateway and web monitoring in control. At the end of the course, students are required to implement control applications as mini-project demonstrating capability in control integration over LAN and WAN environment.

ET0909
MEMS AND MICROSYSTEMS
This module starts with an overview of MEMS and Microsystems and the various micromachining techniques. The Microsystems fabrication processes, materials and the various applications are covered. A bulk micro-machined pressure sensor is used as an example in the designing and fabrication of a MEMS device.

ET0916
FIELDBUS TECHNOLOGY
Provides students with the knowledge to connect instruments and field devices of an automation system to the controller using internationally recognised communication standards. Fieldbus is an industrial network system for real-time distributed control. The technologies covered are ModBus, Foundation Fieldbus and PROFIBUS. Strong emphasis is placed on application of these technologies in the area of process and discrete manufacturing industries.

ET0917
PLC APPLICATIONS
This module is a PLC-based automation project in which students learn step-by-step approaches of implementing an automation system. It involves programming, identifying appropriate I/Os, I/O interfacing and power rating considerations, programme testing and system trouble-shooting. Students will learn the full process of implementing a PLC-based project.

ET0919
POWER TRANSMISSION AND DISTRIBUTION
Provides students with knowledge and understanding of the main equipment such as cables, transformers, circuit breakers and associated protective devices used in the transmission and distribution of electrical power. Standard requirements for effective delivery of electrical energy through HV transmission and distribution networks to various types of consumers will be emphasised. Principles, characteristics and application of various protective relays will also be covered. Students will also learn the technical knowledge and skills in the installation, maintenance and testing of electrical systems in high-rise residential, commercial and industrial buildings. Students will be trained to practise in accordance with good local engineering requirements and the related Codes of Practices/Standards.

ET0920
POWER SYSTEM ANALYSIS
The module aims to equip students with the essential concepts of power system analysis and control covering generation and power grid. Emphasis is placed on power plant generators, frequency and voltage control and power grid analysis which contains power system representation, power flow used in planning and operating environments, stability of system voltages and frequency, harmonics calculations and power quality issues and mitigations.
Computer software will be used to simulate power system models and aid understanding of the concepts involved.

ET0922
INTELLIGENT ROBOTICS SYSTEMS
Aims to provide insight of the latest research in the robotics field as well as a hands-on approach by introducing foundations and practical on key topics of robotic systems within a multi-disciplinary framework. It also aims to offer a practical point of view into how to design systems that close the perception-process-action loop in both simulation and real mobile robots applied to industry and service domains.

ET0923
MULTI-DISCIPLINARY PROJECT
Aims to allow students to integrate and apply what they have learnt in various other modules in a context of a multi-disciplinary project. Students will carry out research and development work in an environment that encourages team work and communication with students from other disciplines. They will learn to manage their time and project budget. Students will be required to keep a portfolio, write reports, present their ideas orally and demonstrate their project to different audiences through a 'show-and-tell'.

ET0924
RAPID TRANSIT SYSTEM
Provides students with knowledge and application skills in identifying the main features and functions of various systems within a rapid transit environment. The module covers history of rapid transit system, operating philosophy of rail operations, main functions and features of different systems within the rapid transit network, namely, Communication system, Electrical, Mechanical and Fire, Environment Control system, Escalator, Platform and Lift system, Fare system, Infrastructures (architectural and structural) finishes, Integrated Supervisory Control System, Permanent Way, Power system, Rolling Stock and Signalling system. Safety and Security measures in rapid transit environment are also introduced.

ET0925
RAPID TRANSIT SIGNALLING SYSTEM
Provides students with knowledge of the principle of train control and supervision in an urban transit signalling system. The module covers roles and importance of the Signalling system in Railway Operation, Signalling System configuration, architecture and interfaces with other systems, Signal Interlocking System, Train Supervision System and Train Control System. Students will have a chance to demonstrate their knowledge of the module by designing and implementing a railway model as their graded assignment.

ET0926
IMMERSION PROGRAMME
The Rapid Transit Technology immersion programme is a 14-week attachment at an institution offering rapid transit training programme. The programme allows students to experience the real rapid transit work environment that requires students to utilise the fundamentals that they have learnt in the classroom. There will be great opportunity to interact with the rapid transit professionals and discover in depth the signalling, fare systems, communications and integrated supervisory control systems during the learning process. The immersion programme will be graded. There are two components: practical performance and final report and presentation. Practical performance will be assessed by the hosting institution. The final report and presentation on learning experience will be assessed by SP.

ET0927
ROBOTICS TECHNOLOGY
This module aims to provide students with an insight of the latest trends and applications in robotics technology as well as a hands-on approach by introducing foundations and practical on key topics of robotic systems within a multi-disciplinary framework. This module introduces the student to the different methods and technologies to programme and control robotic systems. Students learn to be effective in the design of controllers for robotic systems. The module offers a practical point of view into how to design systems that close the perception-process-action loop in both simulation and real mobile robots applied to industry and service domains.

ET1003
DIGITAL ELECTRONICS I
Introduces students to the knowledge, understanding and design techniques necessary, to enable them to design simple combinational circuits using commercial SSI and MSI integrated circuits. Additional topics covered include introduction to simple sequential logic circuits such as flip-flops and mono-stables.

ET1004
DIGITAL ELECTRONICS II
Builds on basic material covered earlier with advanced topics such as adders, multiplexers/demultiplexers, decoders/encoders, counters and shift registers and some application examples of these circuits.

ET1005
PRINCIPLES OF ELECTRICAL AND ELECTRONIC ENGINEERING I
This module covers the fundamental concepts of electricity. Basic laws and theorems which govern the operation of electrical circuitry are explained with illustrations. Understanding and application of electrical phenomena are further enhanced using circuit simulation on worked examples and tutorial problems and via hands-on sessions. Topics covered include scientific notation, engineering notation, metric prefixes, basic elements of an electrical circuit, definitions of energy and power, power sources, measuring instruments, DC and AC concepts, simple series and parallel networks, electromagnetism, inductor, inductance, transformers, capacitor and capacitance, characteristics of inductor and capacitor in DC, Kirchhoff's Voltage and Current Laws, Current and Voltage Divider Rules and Superposition Theorem.

ET1006
PRINCIPLES OF ELECTRICAL AND ELECTRONIC ENGINEERING II
Extends the basic concepts onto other electrical and electronic devices. Topics covered include: Semiconductor physics, semiconductor devices such as diodes, special diodes and bipolar transistors, transducers such as thermistors, and application of operational amplifiers, complex numbers and concepts of phasors, phasor angle, phasor diagrams, reactances, impedances, susceptances and admittances. Upon completion, this module consolidates students' foundation of the electrical and electronic engineering.

ET1007
INTRODUCTION TO ENGINEERING I
This practical-based module aims to promote interest in engineering by introducing the interdisciplinary nature of engineering systems and their manufacturing processes to the students. Appreciation on the business aspect of what is required to bring a product to market will also be taught. In the process, students will also be trained to operate various commonly available workshop machine tools and electronic instruments. Students will have opportunities to develop their thinking skills, problem solving skills and interpersonal skills such as teamwork and communications.

ET1010
MICROCONTROLLER APPLICATIONS
Introduces the use of microcontrollers in a range of system applications. Students are taught how a microcontroller works, how to program it, and the use of microcontroller. In addition, students will learn basic analogue and digital support circuitry, sensors and actuators/displays required for a microcontroller based application. This module allows students to develop a project conceived around a microcontroller system with sensors and output devices.

ET1011
INTRODUCTION TO ENGINEERING I
Provides a platform where students can put into practice what they learnt in Year 1 technical modules. Students design, test and build several practical and interesting projects and in the process learn essential skills like milling PCBs, laser cutting, 3-D printing, circuit simulation, stripboard fabrication, soldering, circuit assembly and troubleshooting Projects are designed to integrate theory learnt from different modules. To support the CDIO initiative, teamwork, creative and critical thinking and presentation skills are emphasised in this module.

ET1012
INTRODUCTION TO ENGINEERING II
Provides a platform where students can put into practice what they learnt in Year 1 technical modules. Students design, test and build several practical and interesting projects and in the process learn essential skills like milling PCBs, laser cutting, 3-D printing, circuit simulation, PCB layout planning and fabrication, strip-board fabrication, soldering, circuit assembly and troubleshooting. Projects are designed to integrate theory learnt from different modules. To support the CDIO initiative, teamwork, creative and critical thinking and presentation skills are emphasised in this module.

ET1019
NATURE-INSPIRED DESIGN
An integrated hands-on module for students to put engineering theory into practice early in their course by working in teams to design and build engineering artefacts taking inspiration from nature. Teamwork, creative and critical thinking and presentation skills are emphasised.

ET102Y/Z
FINAL YEAR PROJECT
Provides students with the opportunity to be innovative, creative and to be responsible for selecting, formulating, planning, executing and reporting on a challenging piece of work that could provide a solution to an engineering problem. The module also aims to provide students with the opportunity to apply and integrate the knowledge and skills acquired during their polytechnic studies and industrial attachment.

ET1020
INTERNSHIP
The Internship provides opportunities for students to gain practical experience in the working environment so as to prepare them to be “Work Ready”.

ET1021
INTERNSHIP PROJECT
Provides students with the opportunity and responsibility to be innovative / creative, find or select, formulate, plan, carry out and report on a challenging piece of work that could provide a solution to the engineering problem. The module also aims to provide students with the opportunity to apply and integrate their knowledge and skills acquired during their polytechnic study and internship.

ET1050
ENGINEERING AND DESIGN
Introduces students to design principles and application of engineering theory. Students work in teams to design and build engineering artefacts taking inspiration from natural phenomenon. The main theme of project work is water as it is related to their daily life. Students design and build projects that involve water, or exploit properties of water or address issues related to water. With water being the main theme of the projects, applications can be broad, ranging from water quality, filtering, and sanitation to demonstration projects that exploit the properties of water such as buoyancy, pressure, cooling etc.

ET1114
SMART GRID AND ENERGY STORAGE
Aims to equip students with the knowledge of smart grid and energy storage and the skills of applying the smart grid technology. It is focused on principles, operations and management of a smart grid which deploys modern communication networking infrastructure and advanced automation technologies to integrate different energy generations (conventional and renewable) to the grid, provides energy monitoring, control and management for the utility and consumer alike and ensure more reliable, more economic and safer energy supply.

ET1115
ENERGY MANAGEMENT AND AUDITING
Aims to impart participants with the knowledge of various levels of Energy Audit, perform energy performance analysis, prepare and provide recommendation and audit report. Students will be introduced to the Energy Market within Singapore and the basic concepts of Energy Management System (ISO 50001 EnMS). The fundamental knowledge to carry out Energy Economic analysis and cost prediction for energy saving assessment and application of Measurement and Verifications (M&V) will be shared through various case studies and/or application examples.

ET1116
INTEGRATED BUILDING ENERGY MANAGEMENT SYSTEM
Provides thorough understanding of issues related to lighting, motor driven system and integrated building management system. The lighting segment covers the design and selection of energy efficient lighting in industrial and office buildings. The fundamental concept and optimisation of motor will be discussed. The module is also designed to provide students with a good working knowledge of the design and applications of modern integrated building management system. Application areas will include air-conditioning systems, fire detection and alarm systems and security systems.

ET1117
SOLAR PHOTOVOLTAIC SYSTEM DESIGN
Equip students with the knowledge from different types of solar cells to solar modules. Designing, installing and maintaining a standalone and a grid-tied PV system will also be taught. The module will cover issues of load calculation, battery selection, calculation of PV capacity, charger controller and inverter selection, site selection, system installation, monitoring and analysing PV system performance, estimating output from PV system and environmental impact.

ET1200
ELECTRICAL ENGINEERING PRINCIPLES
Provides students with an understanding of basic electrical engineering principles. Students apply the knowledge during hands-on lab sessions, with the proper use of instruments for measurements. The module covers basic electrical concepts such as electrical charge, current, voltage, power, energy, Ohm’s Law, series-parallel circuits, Kirchhoff’s Laws, electromagnetism, single phase AC theory and effects of resistor, capacitor and inductor in AC circuits, including operation of single-phase transformer.

ET1201
ELECTRONIC ENGINEERING PRINCIPLES
Cover basic concepts of fundamental electronics starting from number systems used in digital electronics, basic logic gates, combinational logic circuits, flip-flops, binary counters and interfacing digital circuits to basic analogue electronics. Upon completion of this module, students should be able to apply fundamental electronic techniques in electronic circuit design and analysis.

ET1202
FUNDAMENTALS OF COMPUTER AND INFORMATION SYSTEMS
Introduces students to the world of computers and computing techniques. Students will find out about the different computer hardware platforms and their uses in business and industrial applications. They will learn about the structure of a computer, how data is collected and processed, storage requirements as well as basic computer networking. Students will also be shown how users and the environment interact with computers, the different types of operating systems and application software currently used in industry and application. The module also covers the impact of computers on society by looking at ethics, security, privacy and information systems.

ET1205
WIRELESS TECHNOLOGY APPLICATIONS
Students will acquire knowledge of commonly used wireless technology that enhances or improves our daily lives. They will learn the basic features and use of wireless technology such as RFID, Wi-Fi, Bluetooth, WiMAX, ZigBee and Mobile technologies such as 3G and 3.5G. Applications that are related but not limited to entertainment, leisure activities, sports for individual and community users as well as ergonomic aspect of user interface will be considered.

ET1215
ENGINEERING DESIGN AND BUSINESS PROJECT I
Develops students' entrepreneurial mindset by linking engineering products/services with business viabilities. Students will use design thinking methodology to approach their works and ethnography to gain insight to them. At the end of this module, they will produce prototypes to demonstrate their business ideas.

ET1216
ENGINEERING DESIGN AND BUSINESS PROJECT II
Introduces students to the use of microcontrollers in a range of system applications. Students are taught how a microcontroller works, how to program it and the use of microcontroller. In addition, they will learn basic analogue and digital support circuitry, sensors, actuators and displays required for a microcontroller based application. Students will apply what they have learnt to develop a project conceived around a microcontroller system with sensors and output devices. Students will also have the opportunity to consider the business aspects of the project that includes developing a simple marketing plan and demonstrating how they will sell their product.

ET1217
ENGINEERING PROJECTS FOR ENTREPRENEURS
This module builds on the integrated engineering & business knowledge and skills acquired from the earlier foundation modules of the course and provides students the learning platform to explore opportunities from existing and emerging technologies by implementing a product that can be developed into a viable business. Students will learn to create value propositions, assess risks and develop project plans as an integral part of their projects by developing the entrepreneurial mind-set and attitude to bring their projects to the next level.

ET1400
ENGINEERING SYSTEM DESIGN
This project based module requires students to implement a new engineering system. It covers modern tools and methods for implementation. Topics include prototyping, user interface, design, and implementation. Students need to consider marketing, user feedback and other commercial aspects of system development.

ET1401
INTEGRATED AUTOMATION SYSTEMS
Provides students with the knowledge required to perform integration of automation equipment across various automation levels; Field Level, Controller Level and Operator Level. Students will execute Programmable Logic Controller (PLC) based projects for the automation industries incorporating use of basic logic and advanced programming instructions set. The integration and operation of peripheral devices such as Human Machine Interfaces and Field devices to the PLC will be covered.

ET1402
WIRELESS INSTRUMENTS
Introduces data collection of field instruments and configuration of controller and control server by using industry standard wireless technologies. Topics covered in the module include industry standard, wireless topology, calibration instruments, gateway configuration, data GUI creation and integration to distributed control system. At the end of the module, students are required to implement wireless control process as a mini-project demonstrating capability in wireless instrumentation and intelligent control integration.

ET1403
ELECTRICAL CONTROL SYSTEM
This module covers the control system design and operation for different types of land vehicles. Topics include Information Management System, Event Recorder, and auxiliary electrical equipment.

ET1404
ELECTRICAL POWER SYSTEM
This module covers the basic operating principle of Electrical Power Supply system in Electric Vehicles and for a Mass Rapid Transit (MRT) system. The topics covered include DC-DC Converter, PWM Controller, DC and AC motors and Batteries.

ET1406
DISTRIBUTED CONTROL SYSTEM APPLICATIONS
Provides students with relevant skills required to design network control applications in automation and process system. The module introduces networking basics including OSI 7 layers, TCP/IP model, IP addressing, network implementation, routing and Ethernet switching. Control topics covered in the module include DCS design, SCADA monitoring, Foundation in Fieldbus, control gateway and web monitoring in control. At the end of the course, students are required to implement control applications as mini-project demonstrating capability in control integration over LAN and WAN environment for manufacturing industry.

ET1407
INTRODUCTION TO ENGINEERING
This is an interdisciplinary hands-on module for students to put engineering theory into practice early in their course, by working in small groups to understand, devise and build engineering projects taking inspiration from commercial examples, such as home appliances. Students will be encouraged to explore the strengths and weaknesses of current designs. They will also employ electrical engineering fundamentals along with mechanical knowledge taught in a companion module as necessary to design and fabricate interesting and challenging projects. The process will expose students to a range of generic process skills such as creative and critical thinking, teamwork and communication.

ET1408
SMART CITY SYSTEMS DESIGN
This module aims to cover pervasive connectivity and architecture needed to deploy smart nation and smart city ecosystems. Topics covered include networking technologies and protocols, IoT/M2M architecture and infrastructure, network cloud and systems security. Students will apply knowledge gained and explore into various case studies and examples of smart city application and ecosystem worldwide. Government's Smart Nation Sensors Platform for wireless sensor network as well as Smart Nation OS are covered too. This module will also act as the capstone module for a "Smart City" project.

ET1409
DATA ANALYTICS
Students will be introduced to various data mining tools, data processing techniques and algorithms used for the analysis and visualization of the collected data stored on both local and public cloud servers. Students will apply the knowledge gained to build a functional prototype system that is able to store and analyse data. This system will be used in a "Smart City" project.

ET1410
PROJECT MANAGEMENT
This module provides students an opportunity to integrate knowledge, design thinking framework and project management skills that they have acquired from the course. Students will apply analytical, design thinking, problem solving, project management, presentation and communication skills. Students will also learn how to use Microsoft Project to manage a project.

ET1501
NETWORK SERVER ADMINISTRATION
This module teaches the installation, configuration, application and use of Network Server Operating Systems. Students are taught how to install, configure and manage users and computers over a network. Topics that will be covered include server installation, configuration, management of accounts and resources, troubleshooting and network security.

ET1502
COMPUTER COMMUNICATIONS
Provides the basic concepts in data communication. It covers the necessary understanding of essential networking equipment and techniques used in the implementation of data communication systems. In addition, examples of applications of data communication in the industry are also included with extensive hands-on operations using data communication equipment.

ET1503
COMPUTER NETWORKING
Introduces protocols using TCP/IP, routing, bridging and acquiring an understanding of router components and routing protocols. Topics include routing protocols, configuration and management of access lists and packet filtering.

ET1504
INTERNETWORKING
This module covers LAN design and switching, concept of VLANs, Wide Area Network technologies and design, and protocols for transporting voice and data over wide areas. Students are also taught network planning, managing, load sharing and security techniques.

ET1521
INTEGRATED BUILDING MANAGEMENT SYSTEMS FOR ENERGY EFFICIENCY
This module is designed to provide students with a good working knowledge of the design and applications of modern integrated building management system. One of the objectives is to save energy and costs by implementing it. It aims to provide participants with in-depth knowledge of the procedures involved in the specification, design, installation, commissioning, operation, and maintenance of an IBMS. Application areas will include air-conditioning systems, fire detection and alarm systems and security systems. The lectures will be extensively complemented by hands-on training sessions on a fully functional IBMS in the practice of energy efficiency and management.

ET1522
POWER QUALITY AND ENERGY SYSTEM (PQES)
This module furnishes participants on the causes of power quality issues, voltage dips and their effects on sensitive process and facilities, harmonics distortion and its effects on power system equipment, mitigation methods and power quality monitoring. Participants will learn the principles of different energy resources, including stand-alone and grid connected system, how to implement fuel cell technology in a variety of applications. The module also covers lighting technology principles and efficient lighting practices. The working principles/configurations of DC, AC and Chopper drives and various application areas of electrical drives will be covered.

ET1523
ENERGY MEASUREMENT AND APPRAISAL (EMA)
The objective of this module is to impart participants with the knowledge to lead detailed energy audit, perform energy performance diagnosis and analysis, prepare and provide sound recommendation and report. This module will identify the main energy intensive areas within a facility resulted from air-conditioning, water heating, and lighting. Thereby suggest appropriate energy conservation measures to reduce the operating cost of the facility while improving efficiency. The various ways to reduce energy cost of the facility, understanding and assessing the historical energy usage pattern, and types of audit tools instrument used will be outlined.

ET1524
ENERGY MANAGEMENT & ECONOMICS (EMS)
One of the key aims of the module is to train the students to understand how to set up a successful energy management programme. This module will provide an overview of the New Electricity Market (NEM) in Singapore. It will also address the relevant pertinent rules and impact on facilities. An overview of the NEM and its Students will be exposed to the fundamentals of energy economic and life cycle cost concept and calculation. The knowledge to carry out financial analysis and cost prediction for energy saving assessment will be shared through various case studies and/or application examples.

ET1600
DYNAMICS AND CONTROL
Introduces the basic principles of automatic control and illustrates the application of these principles in modern control systems. Topics include mathematical models, dynamic analysis, stability analysis, frequency response analysis, s-plane analysis and compensation techniques.

ET1610
COMPUTER METHODS FOR POWER SYSTEM ANALYSIS
Students will learn techniques and algorithms for the formulation of network matrices for power system analysis such as power system fault studies for symmetrical and unsymmetrical faults, load flow studies and transient stability analysis. Emphasis is on the application of computer methods for solution of these problems. Interpretation and use of results to specify circuit breaker ratings and relaying systems, methods of reinforcing and improving system security and stability will be included.

ET1611
POWER SYSTEM PROTECTION
Teaches the fundamental principles of relay operation and shows how they are applied to the protection of specific system elements. Over-current, directional, differential, pilot and distance protective relays will be described. Calculation of relay settings for the different types of relays will be explained. Also included are the fundamental application principles, special requirements of the various system elements, application practices, and methods of testing and commissioning protective schemes.

ET1612
POWER TRANSMISSION AND DISTRIBUTION
Provides students with an insight into the areas of designs and roles of electricity transmission and distribution. Also enables them to understand the principles of operation of various types of busbar arrangements, network configurations and high voltage equipment including cables, reactive power and voltage compensation devices. Overvoltages and voltage transients in power systems and the concept of insulation co-ordination for high voltage equipment are introduced. The application of computer and CAD software packages to carry out electrical design and drafting will also be included. Smart metering and smart grid will also be discussed.

ET1613
HIGH VOLTAGE OPERATION
Introduces high voltage equipment and accessories like high voltage switchgears, circuit breakers, transformers, metering and protection relays. Understanding of high voltage single line and control drawings will be emphasised so that the student can understand the control, instrumentation and protection functions of high voltage switchgears. The course will also cover different protection schemes, application of on-load tap changers, and high voltage testing, commissioning and maintenance.

ET1614
POWER SYSTEM PLANNING AND CONTROL
An introduction to the engineering and economic factors involved in planning, operating and controlling power systems. Topics include planning procedures for large utilities and industrial power systems, reliability and contingency analysis, economic studies and financial analysis and computerised Supervisory Control and Data Acquisition (SCADA) systems. Developing trends and the use of Artificial Intelligence in a computerised power system, and electricity market will also be discussed.

ET1622
ELECTRIC DRIVES AND CONTROL
This module provides knowledge to students on the practical aspects of industrial drives. The topics cover DC Drives, AC Drives, Step Motor Drives and their applications, motor sizing, protection and drive system installation.

ET1623
RECTIFIERS AND INVERTERS
This module introduces the students to the operating principles of various types of rectifier and inverters. Various control and modulation techniques as well as the applications of the converters will also be covered.

ET1625
ELECTRICAL SERVICES DESIGN
Provides students with an in-depth understanding of the design methodology of various electrical building services. In particular, it will cover the design, specifications and selection of electrical installation, EIB system, lighting system and lightning protection system. Relevant acts and regulations governing the design of these various electrical services will also be discussed in detail in the module.

ET1630
POWER DISTRIBUTION SYSTEM IN BUILDINGS
Aims to provide students with in-depth technical knowledge on the planning, design and commissioning of high and low voltage (230V — 22 kV), electrical installation and distribution systems in commercial, residential and industrial buildings. Relevant acts and regulations; code of practices and standards; operation, selection and sizing of various system components such as standby generator, switchgear and transformer will also be included in this module.

ET1631
BUILDING AUTOMATION SYSTEMS
This module provides an integrated system approach to understanding Building Automation Systems and their applications to building services. It covers the architecture, communication methods and application software of modern building automation systems, and provides good working knowledge on how to specify, design, install, commission, operate, and maintain a Building Automation System. Application areas include air-conditioning systems, fire detection and alarm systems, security systems and other essential building services. The lectures will be supplemented with hands-on training sessions in the Building Automation System Application Centre.

ET1632
PROGRAMMABLE LOGIC CONTROLLER FOR BUILDING SERVICES
This module introduces students the basic concepts and the principles of programmable logic controller (PLC) related to industry and building automation applications. It also covers the various programming and related sensor technologies for automation and the uses of programmable controllers in industry and building automation like pump control, compressor control, chiller control, lighting control and lift control.

IA0001/IA0002/IA0005/IC0003/IC0004/IC0005
INTERNSHIP PROGRAMME
Provides opportunity to gain professional working experience through attachments to local or overseas companies or organisations. Students are required to prepare a report and proper documentation on the internship programme.

IA2005
INTERNSHIP PROGRAMME
Provides students the opportunity to be professionally prepared for the relevant industries via a three months' on-the-job training programme. Students would be able to apply their knowledge and hone their skills in a real-world context while cultivating the right working attitude.

IA4001
INTERNSHIP PROGRAMME
The 12-week Internship Programme aims to provide students with an authentic on-the-job work experience in a relevant engineering or technological field which enables them to be truly work-ready. Students will also be able to learn from the experiences of working professionals and build a network in that industry. Students will undergo a structured learning programme, which includes work place safety and health (WSH) and participating in the day-to-day work at the industry as part of their internship training. The intent of the programme is to enable students to apply and enhance their range of technical skills, hone their knowledge in areas such as professional ethics, role and responsibility of engineers, and understand the industry landscape. By the end of the programme, students would have gotten a deep insight of job scopes, the expectations of the industry, as well as opportunities to develop technical workplace competencies and other vital professional skills.

IA8001/IA8002/IA8003/IA8004
INTERNSHIP PROGRAMME
This module aims to immerse students with the real-world industry experience. This programme comprises a 12-week internship programme integrating a structured learning outcome which facilitates authentic learning.

IB1002
INTERNSHIP
Provides students with opportunities to gain professional experience working with social service organisations, education-related companies and other community development agencies. This is an 18-week internship programme and students will get a chance to put their applied drama skills and/or psychology knowledge to good use.

IB2004
INTERNSHIP PROGRAMME
This is a 4-month programme that allows students to gain retail Optometry learning experience in optical outlets.

IB3001
INTERNSHIP PROGRAMME
Students are sent to intern at selected local and overseas organisations to further develop their functional and technical skills through working on real-life projects in the area of their study such as visual design, animation and graphics design. Students contribute to the organisations by applying what they have learnt, while also learning and gaining experience from a real-life digital media working environment.

IB3002
INTERNSHIP PROGRAMME
Students will intern at selected local or overseas organisations to further sharpen their IT skills and knowledge, through working on real-life projects in the areas of their study. Students contribute to the organisations by applying what they have learnt, while also learning and gaining experience from a real-life working environment.

IB3003
INTERNSHIP PROGRAMME
Students are sent to intern at selected local and overseas organisations to further develop their functional and technical skills through working on real-life projects in the area of their study such as info-comm security, IT security operations, governance, risk and compliance. Students contribute to the organisations by applying what they have learnt, while also learning and gaining experience from a real-life IT working environment.

IB3004
INTERNSHIP PROGRAMME
Students are sent to intern at selected local and overseas organisations to further develop their functional and technical skills through working on real-life projects in the area of their study such as interaction design, visual design, front-end web development, mobile applications, information systems, game development and info-comm security. Students contribute to the organisations by applying what they have learnt, while also learning and gaining experience from a real-life IT working environment.

IB3005
INTERNSHIP PROGRAMME
Students are sent to intern at selected local and overseas organisations to further develop their functional and technical skills through working on real-life projects in the area of their study such as visual design, animation, visual effects, motion graphics and graphics design. Students contribute to the organisations by applying what they have learnt, while also learning and gaining experience from a real-life digital media working environment.

IB3006
INTERNSHIP PROGRAMME
Students are sent to intern at selected local and overseas organisations to further develop their functional and technical skills through working on real-life audio-related projects. Students contribute to the organisations by applying what they have learnt, while also learning and gaining experience from a real-life digital media working environment.

INTERNSHIP PROGRAMME
Enables students to gain professional and hands-on work experience through work attachments in business organisations with disciplines/functions such as marketing management and operations management.

INTERNSHIP PROGRAMME
Aims to provide students with an internship programme through placement in the functions of finance, risk management, compliance, business analytics and intelligence, technology and operations, digital marketing, either locally or overseas. This is a 17-week internship program.

INTERNSHIP PROGRAMME
Enables students to gain professional experience through work attachments in organisations with Banking and Finance functions.

IC2002
INTERNSHIP PROGRAMME
The 22-week internship forms an integral part of the coursework and allows students to gain practical working exposure to real-life industrial environment and further develop technical/research skills and knowledge. It will help develop important work skills such as positive working attitude, initiative, interpersonal/communication skills and team work.

IC2003
INTERNSHIP
Provides students with the opportunity to develop key work related knowledge and skills while working in chemical engineering companies for a minimum duration of 15 weeks. Students will have an opportunity to carry out applied research projects for the companies that they are attached to.

IC2007
INTERNSHIP PROGRAMME
Allow students to apply and integrate the knowledge and hands-on skills acquired through the Biomedical Science course during their internship at the industries and/or research laboratories.

IC4001
INTERNSHIP PROGRAMME
The Internship Programme aims to provide students with an authentic on-the-job work experience in an engineering, or technology-enabled business field, to prepare them to be truly work-ready. Students will also be able to establish an industry network and learn from the experience of working professionals. Students will undergo a structured learning programme, including attending safety induction and participating in the industry projects as part of their internship. The intent of the programme is to enable students to apply and enhance their range of technical skills, hone their knowledge in areas such as professional ethics, role and responsibility of engineers, and understand the business environment in which companies are situated – as advocated by the CDIO syllabus. By the end of the programme, students will have a greater insight into what industry expects of employees, as well as opportunities to develop technical workplace competencies and other important professional skills.

IC5001
INTERNSHIP
This semester long (22 weeks) internship module aims to provide students with work experience to a relevant industrial sector and with opportunities to relate what is taught in the classroom to actual working environments. The internship module creates a valuable opportunity for students to learn and contribute to the participating organisations. This would also prepare them to be work-ready by acquiring knowledge on current industrial practices and by sharpening their skills.

INTERNSHIP PROGRAMME
Aims to provide students with an internship programme through attachments in tourism and hospitality related organisations either locally or overseas.

IC7009
INTERNSHIP PROGRAMME
Enables students to gain professional experience through work attachments in organisations on areas of accounting, auditing, finance and taxation.

IE5001
PROJECT (22 WEEKS)
Provides an opportunity to work in small groups to apply the knowledge and experience gained in their foundation stages to conceive, design, fabricate, test and commission a project. This include the opportunity to work with the industry on solving real-world problems.

IF9001
ENHANCED INTERNSHIP
During this phase students will be attached to a relevant maritime related/logistics organisation. They will be expected to put into practice the knowledge and skills that they have acquired in the polytechnic. Their progress will be closely monitored by the in house company supervisor and also by a liaison officer (staff of the polytechnic). During this period they are expected to complete their Project Log Book.

IF9002
INTERNSHIP PROGRAMME
This programme provides students with the opportunity of local or overseas attachment to industry companies for a 26-week period whereby they can gain working experiences and exposure to industrial practices beyond the structured curriculum.

IG201Y/Z
INTERNSHIP PROGRAMME
Refer to IC2007

IG203Y/Z
INTERNSHIP PROGRAMME
Allows students to apply and integrate the knowledge and hands-on skills acquired through the Biotechnology course to their internship at industries and/or research laboratories.

IH701Y/Z
INTERNSHIP PROGRAMME
This module aims to cultivate professional work habits by learning first hand from the pre-determined divisions of an organisation. By being immersed in a work environment, the module creates a valuable opportunity for applied learning where the students can acquire deeper knowledge about the hospitality industry. Using Emotional Intelligence (EI), a discipline that was infused in various modules and crucial in this industry, to the actual workplace, it enables the students to navigate their emotions well in a highly strung and fast-paced industry with high guest contact frequencies It also offers an alternative accelerated pathway for the students to secure a non-entry level position in a Hospitality after graduation.

IS2006
INTERNSHIP
Internships are important learning experiences preparing students to experience the real world of work and apply directly the knowledge, skills and values related to Food Science and Technology. The outcomes that students should have at the end of the module must include more than the acquisition of discipline specific knowledge, skills, values and attitudes. In addition, students should also develop competencies like collaboration, communication, responsibility, management of work and time.

IT8001
INFOCOMM SECURITY AND NETWORK ESSENTIALS
Introduces students to the fundamental concepts of infocomm security such as identification, authentication, authorisation, integrity and confidentiality. Students will also learn security essentials like network protocols and basic operating system commands.

IT8002
CYBER DEFENCE AND RANGE EXERCISES
Introduces students to tools to discover and exploit vulnerabilities in networks and operating systems. They will be taught the security issues found in software, especially web applications. Security components like firewalls and IDS (Intrusion Detection Systems) will also be introduced as countermeasures to defend against cyber-attacks. Students will have the opportunity to integrate the knowledge and technical skills learned by taking part in scenario-based exercises.

IT8003
DIGITAL FORENSICS AND INVESTIGATION
Equips students with the fundamental concepts and techniques of computer and mobile forensics. Students will learn to acquire, analyse and present computer and mobile data as evidence.

IT8004
SECURITY POLICY AND INCIDENT MANAGEMENT
Equips students with the fundamental concepts and techniques of Security Information and Event Management (SIEM). Students will also learn the essentials of security policy development, risk assessments and security models.

IT8050
WEB APPLICATION SECURE CODING
This module teaches the basic fundamentals of secure coding in web applications. Some secure coding concepts such as use of stored procedures to prevent SQL injection, importance of validation, exception handling, logging, authorisation, role based authentication and cryptography will be covered. Students will learn through a series of practical exercises on how they can secure their code and fix unsecured code that can exploited.

IT8201
INFOCOMM SECURITY AND NETWORK ESSENTIALS
Covers the latest developments in infocomm security and networking, and teaches fundamental configuration and administrative tasks for various operating systems.

IT8202
ETHICAL HACKING AND DEFENCES
Teaches in-depth understanding of how to test networks and websites for potential exploits for the purpose of securing them. Advanced offensive and defensive skills will be covered for discovering potential security problems with servers and networks.

IT8203
SECURITY MANAGEMENT AND INCIDENT RESPONSE
Aims at equipping students with knowledge and skills in security information and event management. The models and tools will be covered on how to perform manual analysis, automatic analysis or real-time monitoring and reporting on security events. Techniques to correlate events for advanced incident detection will be taught. Students will practise on how to detect and respond to security incidents in scenarios.

IT8204
DIGITAL FORENSICS
Equips students with the fundamental concepts and techniques of computer and mobile forensics. Students will learn to acquire, analyse and present computer and mobile data as evidence. Students will be taught practical-based forensic investigation methodology and the proper handling of evidence.

IT8205
SECURE CODING
Equips students on how to build secure Java applications and gain the knowledge and skills to keep a website from getting hacked, perform application penetration testing to counter a wide range of application attacks, and prevent critical security vulnerabilities that can lead to data loss.

IT8206
MALWARE REVERSE ENGINEERING
Aims at equipping the students with the knowledge of malware analysis to reverse engineer the malware using practical tools and techniques. The three phases of behavioural, code and memory analysis of malware will be taught. Students will learn the techniques of reverse engineering compiled Windows executable malware, common anti-decompiling techniques and analysis of malicious documents and images.

IT8604
MOBILE PROGRAMMING
This module aims to teach students programming concepts suited for mobile devices. Students will be taught programming concepts such as data structures, control structures, methods and arrays. Students will learn multithreading and concurrent programming to take advantage of multicore mobile devices. By the end of the module, students will be competent in writing code for mobile devices.

IT8701
INTRODUCTION TO PROGRAMMING FOR DATA SCIENCE
Provides students with the fundamental skills to code applications to retrieve, manipulate, process and visualize data using the Python programming language. Students learn key concepts such as what structured and unstructured data are, and how they can create and manipulate relational and NoSQL databases to explore data and to create visualizations that can help them gain useful insights from it.

IT8801
MOVING VISUAL DESIGN
To equip students with knowledge and skills in the idealisation, planning, design and finally animation for their moving visual presentation. Students will be taught the fundamentals of creating and using various media elements such as graphics, photo and videos for their moving visual presentation. The final moving visual presentation can then be used in a wide array of media outlets such as online video hosting sites as well as social media sites.

LC0154
COMMUNICATING FOR PERSONAL AND TEAM EFFECTIVENESS
This module aims to equip students with the necessary skills to develop self-awareness, reflection skills, problem-solving and decision-making skills, as well as oral and writing skills necessary for personal and team effectiveness.

LC0155
COMMUNICATING FOR PROJECT EFFECTIVENESS (PROPOSAL)
This module aims to equip students with the skills to articulate and communicate ideas persuasively, and to work effectively in teams. They will be taught to pitch ideas or concepts and to write proposals to an intended audience.

LC0156
COMMUNICATING FOR PROJECT EFFECTIVENESS (REPORT)
This module aims to equip students with the skills in effective communication, teamwork and interpersonal communication, and report writing.

LC0157
COMMUNICATING FOR PROFESSIONAL EFFECTIVENESS
This module aims to equip students with the essential communication and interpersonal skills necessary for work and the pursuit of further studies.

LC0254
COMMUNICATING FOR PERSONAL AND TEAM EFFECTIVENESS
Refer to LC0154.

LC0255
COMMUNICATING FOR PROJECT EFFECTIVENESS (PROPOSAL)
Refer to LC0155.

LC0256
COMMUNICATING FOR PROJECT EFFECTIVENESS (REPORT)
Refer to LC0156.

LC0257
COMMUNICATING FOR PROFESSIONAL EFFECTIVENESS
Refer to LC0157.

LC0332
COMMUNICATION SKILLS FOR SALES AND MARKETING
This module aims to equip students with the communication skills necessary for sales and business marketing. Through role-plays and projects, students will use the oral and written skills learnt to make effective sales/marketing presentations and write sales/marketing proposals. They will be given opportunities to apply sales and marketing techniques, from using business telephone skills to simulated business meetings with clients.

LC0354
COMMUNICATING FOR PERSONAL AND TEAM EFFECTIVENESS
Refer to LC0154.

LC0355
COMMUNICATING FOR PROJECT EFFECTIVENESS (PROPOSAL)
Refer to LC0155.

LC0356
COMMUNICATING FOR PROJECT EFFECTIVENESS (REPORT)
Refer to LC0156.

LC0357
COMMUNICATING FOR PROFESSIONAL EFFECTIVENESS
Refer to LC0157.

LC0554
COMMUNICATING FOR PERSONAL AND TEAM EFFECTIVENESS
Refer to LC0154.

LC0556
COMMUNICATING FOR PROJECT EFFECTIVENESS (REPORT)
Refer to LC0156.

LC0557
COMMUNICATING FOR PROFESSIONAL EFFECTIVENESS
Refer to LC0157.

LC0654
COMMUNICATING FOR PERSONAL AND TEAM EFFECTIVENESS
Refer to LC0154.

LC0655
COMMUNICATING FOR PROJECT EFFECTIVENESS (PROPOSAL)
Refer to LC0155.

LC0656
COMMUNICATING FOR PROJECT EFFECTIVENESS (REPORT)
Refer to LC0156.

LC0657
COMMUNICATING FOR PROFESSIONAL EFFECTIVENESS
Refer to LC0157.

LC0658
COMMUNICATING FOR PROJECT EFFECTIVENESS (PROPOSAL)
This module aims to equip students with the skills to articulate and communicate ideas persuasively in order to pitch ideas or concepts and to write proposals to an intended audience. They will also learn to work effectively in teams through applying project team and relationship management strategies taught (for DMB students only).

LC0756
COMMUNICATING FOR PROJECT EFFECTIVENESS (REPORT)
Refer to LC0156.

LC0757
COMMUNICATING FOR PROFESSIONAL EFFECTIVENESS
Refer to LC0157.

LC0854
COMMUNICATING FOR PERSONAL AND TEAM EFFECTIVENESS
Refer to LC0154.

LC0855
COMMUNICATING FOR PROJECT EFFECTIVENESS (PROPOSAL)
Refer to LC0155.

LC0856
COMMUNICATING FOR PROJECT EFFECTIVENESS (REPORT)
Refer to LC0156.

LC0857
COMMUNICATING FOR PROFESSIONAL EFFECTIVENESS
Refer to LC0157.

LC1054
COMMUNICATING FOR PERSONAL AND TEAM EFFECTIVENESS
Refer to LC0154.

LC1055
COMMUNICATING FOR PROJECT EFFECTIVENESS (PROPOSAL)
Refer to LC0155.

LC1056
COMMUNICATING FOR PROJECT EFFECTIVENESS (REPORT)
Refer to LC0156.

LC1057
COMMUNICATING FOR PROFESSIONAL EFFECTIVENESS
Refer to LC0157.

LC1157
COMMUNICATING FOR PROFESSIONAL EFFECTIVENESS
Refer to LC0157.

LC2013
FRENCH
Aims to develop students' listening and speaking ability, and to enable them to use basic French to communicate in everyday situations. Although the course emphasises oral communication, some basic reading and writing skills will also be taught.

LC2016
GERMAN
Aims to introduce students to the German language and way of life. The module develops students' speaking and listening skills to communicate in German in everyday situations. Students also learn to read and understand elementary German texts and write short notes.

LC2021 — LC2023
JAPANESE I — III
Aims to introduce students to the Japanese language and its use in everyday situations. Emphasis is given to developing students' speaking and listening skills to enable them to communicate in simple Japanese. Students will be able to identify the different Japanese texts and write short notes and letters.

LC2027
CHINESE
Aims to introduce non-Chinese-speaking students to the Chinese language and culture. While emphasis is given to oral skills, recognition of the Chinese script will also be taught. The module will enable students to communicate in everyday situations, and to read and write simple texts.

LC2031
CONVERSATIONAL BAHASA
Aims to develop students' listening and speaking ability, and to enable them to use basic Bahasa to communicate in everyday situations. Besides acquiring the language skills, students will also be exposed to some aspects of Indonesian culture.

LC2032
CONVERSATIONAL THAI
Aims to develop students' listening and speaking ability, and to enable them to use basic Thai to communicate in everyday situations. Besides acquiring the language skills, students will also be exposed to some aspects of Thai culture.

LC2034
KOREAN
Aims to introduce students to the Korean language and culture. It focuses on speaking and listening skills to enable students to communicate in everyday situations. Students also learn the Korean writing system which will enable them to read and write in Korean at the elementary level.

LC2039
SURVIVAL JAPANESE
Aims to introduce students to the Japanese language, culture and etiquette. Students will be exposed to key spoken expressions, basic conversations and cultural practices used in different settings and situations.

LC701Y/Z
FOUNDATION LANGUAGE AND COMMUNICATION SKILLS
This module aims to equip students with basic communication skills as well as bridge the knowledge and skills gap between N-Level and O-Level English Language. The objective is to cultivate active listeners, confident speakers, skilful readers and accurate writers. The approach of the module is to enable learning through the creation of a rich text environment. Students will be assessed on their accomplishment of authentic communicative tasks.

LC702Y/Z
CULTURE, AESTHETICS AND SOCIETY
This module aims to develop well-informed and adaptable individuals who are able to think critically and act responsibly. Students will develop abilities to manage, use and critically evaluate various types of information from different perspectives, identify connections, draw inferences and make insightful conclusions. Students will develop positive attitudes and values towards themselves, societal and global issues. They will be assessed on their ability to demonstrate appropriate etiquette in cross-cultural situations, deconstructing and appreciating an aesthetic work, as well as oral presentations on technological issues.

LC703Y/Z
ACTIVE AND EFFECTIVE CITIZENRY
This module aims to empower students with a better understanding of themselves, and the world, and of the contribution they can make to the local and global community. They will examine their own values system and how their character can be developed positively through active engagement of communal issues. Students will be engaged holistically in cognitive, affective and physical domains and focusing on principle-centred leadership training. The module objectives will culminate in the completion of a group-initiated service learning project requiring the students to apply the acquired knowledge and skills covered in the module.

LC8001
GENERAL EDUCATION 1 (CRITICAL REASONING AND ARGUMENTATION)
Aims to equip students with critical reasoning skills and provide them with opportunities to practise critical thinking through the exploration of contemporary social issues. It also provides a platform for students to learn the basics of arguments through the formal argumentation structure.

LC8002
GENERAL EDUCATION 2 (CRITICAL REASONING AND PERSUASION)
Aims to equip students with the skills to critically analyse the elements of persuasion in narratives used in a variety of contexts. This is so that students appreciate the power of storytelling in our daily life. Students will also explore the history of discrimination in societies and craft their responses through their own narrative.

LC8003
SOCIAL INNOVATION PROJECT
Aims to equip students with the Design Thinking methodology to conceptualise innovative solutions for real-life problems. Students will explore a social cause, go through the practical rigour of the Design Thinking process and apply suitable Design Thinking tools to address a social issue. Students will be exposed to trends and issues related to themes such as Healthcare, Active Ageing, Environment or Social Integration. In the process, they will develop a greater empathy for the issues affecting our society and realise that they can make a positive impact in the community.

LC8004
GENERAL EDUCATION 3 (ISSUES AND PERSPECTIVES)
Aims to enhance students' knowledge and appreciation of a broad range of social, political and economic issues. Students will learn about the importance and relevance of information literacy skills as well as develop their ability to assess the validity and reliability of information from different sources, consider diverse perspectives, and put forward a convincing point of view.

LC9701
INTERPERSONAL SKILLS AND PROPOSAL WRITING
This module aims to develop students' understanding of the principles of communication and skills for effective written and oral communication. Students will be able to write short, logical business proposals and present these proposals orally in a clear and coherent manner.

LC9702
EFFECTIVE BUSINESS COMMUNICATION SKILLS
This module aims to prepare business students for the work situation by equipping them with the necessary skills to search for a job, prepare the application package and attend an interview; write business messages (e.g. business letters, memos and e-mails); and acquire networking skills to establish good contacts and maintain positive working relationships.

MA003Y/Z
PROJECT
This is a group project. Each group consists of four to five students and is assigned a supervisor. This year-long project aims at inculcating in students the ability to work independently and also in a team. Students learn to research on their own and to solve problems on a topic or area of interest which is relevant to their course of study. The department will endeavour to obtain client-based projects from organisations in the maritime and logistics arena.

MA0059
MARITIME ECONOMICS
Provides students with an understanding of the economic and commercial environment in which the shipping industry operates, including the factors that influence the supply and demand of shipping services. Topics include international trade, demand, supply and cost of sea transport, freight rates, economies of scale in shipping and protection of trade and shipping.

MA0083
FINANCIAL ACCOUNTING IN SHIPPING
Provides students with an understanding of the basic concepts and principles of financial accounting leading to the preparation of published key financial statements including the income statement and balance sheet. Students will learn the double-entry system of accounting, the accounting process, the accounting treatment of assets and inventories, voyage and shipping accounting.

MA0090
FINANCIAL MANAGEMENT IN SHIPPING
Introduces students to the financial objectives and financial environment of maritime-related organisation. It deals with basic concepts such as the relationship of risk and return, and the time value of money. Other areas include financial analysis, forecasting and short term financial planning of a shipping organisation.

MA0093
MARKETING OF SHIPPING SERVICES
Assists students to identify the characteristics of services and their marketing implications for strategy development and execution. It enables potential shipping professionals to be market-oriented in their approach to the shipping business with an awareness of techniques inherent in a marketing outlook for shipping and logistics services.

MA0100
MARINE ENGINEERING KNOWLEDGE
Provides students with the basic knowledge and understanding of the working and constructional features of shipboard machinery and systems.

MA0103
MARITIME PERSONNEL MANAGEMENT
Provides students with an understanding of the importance of human element in shipping business management. The role of human as an individual or as a member of a group in achieving shipping business objectives within the context of the organisation and the cultural, sociopolitical and economic environment is discussed.

MA0105
SHIP MANAGEMENT
Provides students with a thorough knowledge and understanding of the business of ship management, local and international regulations including ISMA recommendations, crew management, technical management, commercial management, cost associated with shipping, voyage estimates and the general planning and operational functions of a ship manager.

MA0110
SHIP OPERATIONS
Trains students how to prepare, embark and launch survival crafts. Students will be taught the use of all survival equipment carried on board merchant navy ships. Additionally, they will be provided with a basic knowledge of the construction of various types of merchant navy vessels.

MA0112
LOGISTICS MANAGEMENT
Students will be able to demonstrate knowledge of the physical and other components of transport systems, an understanding of the significance of freight transport in a modern economy and the application of intermodal concepts. They will be able to analyse the employment, organisational and institutional structures in the freight transport industry in Singapore. They will be able to appreciate the value of a logistics approach to delivery of goods.

MA0113
PORT OPERATIONS
Students will understand the role of ports and terminals in industrial development, multipurpose terminals, specialised terminals and freeports. Visits will be arranged to container, bulk and tanker terminals. They will understand features of transit sheds, warehouses, ICD for breakbulk, LCL and FCL operations, stockpile arrangements for dry and liquid bulk commodities, specialised facilities for hazardous goods and chemicals.

MA0114
PORT AGENCY
Provides students with an understanding of the different types of port agencies and a port agent's role, with particular reference to operations in Singapore. Topics include ship documentation, cargo documentation, disbursements and office organisation.

MA0115
LAW OF CARRIAGE OF GOODS BY SEA
Provides students with an understanding of the law relating to the carriage of goods by sea and its underlying principles. Topics include sources and application of law, basic features of the Singapore legal system, and general principles of the law of contract relating to shipping, agency law, different types of tortuous liability relating to shipping, basic features and main legal aspects of the different charter parties and bills of lading and carriage of goods by sea acts.

MA0116
PORT MANAGEMENT
Provides students with an overview of the policy, planning, operations and management of a port with particular reference to the Port of Singapore. Emphasis is on efficient planning and organisation of resources in order to achieve optimum performance.

MA0117
SUPPLY CHAIN MANAGEMENT
Provides students with an understanding of how supply chain management and distribution channels play integral roles in a firm's marketing strategy. Students will be taught the concept of supply chain management and the types of channel structures. They will also learn the factors that influence channel design, development and performance as well as the role of logistics in supply chain management.

MA0118
HEALTH SAFETY SECURITY AND ENVIRONMENTAL MANAGEMENT (HSSE)
Students will be given an appreciation on the need for HSSE Management on board ships. Topics covered in the module include knowledge of the key elements of a ship's quality assurance, health, safety and security management system as required per the ISM code and the ISPS codes, international legislation on minimising and threat of pollution at sea, and risk assessment in formulating all safety procedures.

MA0119
BUNKERING PRACTICES
Provides students with an understanding of how to deal with bunker suppliers and bunker brokers, checking quality and quantity of bunker supplies, local and international regulations relating to bunkering practices and choice of bunkering port as part of voyage planning.

MA0120
MARINE INSURANCE
Provides students with an understanding of marine insurance and how different aspects of marine insurance play a role in shipping. Topics covered include functions of marine insurance in shipping, organisations of insurance market and companies, Institute Clauses and Common covers for ships, General Average claims, P&I Club, and marine pollution protection schemes.

MA0121
MARINE OFFSHORE OPERATIONS
Provides students with an overview of the offshore industry and related operations. Emphasis will be placed on the types of offshore vessels and their operations including seismic survey, oil exploration and pipe laying methods, a typical organisational structure of offshore management company, basic training requirements of offshore personnel and international organisations influencing the offshore industry e.g. OPITO.

MA0122
ELECTRONIC COMMERCE
Provides students with the basic concepts, implementation and operation of information systems development, with particular reference to information systems used in the shipping and transportation business. GMDSS, VTIS, Portnet, Tradenet and other workflow systems will be covered in this module.

MA0123
MARITIME LAW
Provides students with an understanding of the law affecting the various aspects of shipping business. Topics include ownership structure, registration of ships, roles, responsibilities and legal obligations of the ship's master pertaining to the safety of the crew, ship and cargo, maritime arbitration, collision law, salvage and limitation of liability.

MA0124
SHIP BROKING AND CHARTERING
Provides students with knowledge and understanding of the ship broking and chartering markets. In this regard, it covers all aspects of standard contracts used for the sale and purchase and chartering of ships including ship valuation, laytime calculation, shipping finance and common disputes that occur in chartering and the sale of vessels.

MA0125
INTRODUCTION TO MARITIME INDUSTRY
This module aims to prepare students with skills and knowledge for the multi-faceted sectors of the maritime industry. It aims to enhance students' knowledge and skills to enable them to work on shipping projects and gain better understanding of the industry.

MA0525
SHIP OPERATIONS
Provides students with knowledge of the safety aspects of shipboard operations with emphasis on the rules and regulations. Also provides knowledge and guidance in seamanship and safety practices aboard ships to enable them to keep an independent watch and assist the senior officers in shipboard emergencies.

MA0534
ADVANCED FIRE-FIGHTING
Provides students with an understanding of shipboard fires, their hazards, and the methods and strategies used on board ship to control and combat these hazards. Particular emphasis will be placed on the organisation, control and command of fire parties designed to deal with fires effectively.

MA0536
INTRODUCTION TO NAVIGATION
Provides students with a foundation in navigation and chart work. Students will be introduced to navigation terminology and definitions, determination of the ship's position using celestial and terrestrial bodies, and other navigational aid. The syllabus includes the principles of tides and currents, and basic navigational instruments including the magnetic compass, the gyroscope compass, the echo sounder and the sextant.

MA0539
PRINCIPLES OF NAVIGATION
Provides a foundation for the study of more advanced topics in navigation. The syllabus covers the solar system as used for navigation, the principles and concepts of celestial and ocean navigation, position determination using these principles and concepts, and an understanding of chart projections used in navigation. This module supports the module Practical Navigation taught at the Phase 3 stage.

MA0542
PRACTICAL NAVIGATION
Provides students with comprehensive hands-on application of terrestrial, celestial and ocean navigation principles that are essential skills for keeping an independent bridge watch at sea. This module applies the principles and concepts studied by the students throughout the course including Principles of Navigation taught in Phase I(B), and forms an integral component of the syllabus of the International Maritime Organisation (IMO) for an officer in charge of a navigational watch.

MA0543
COASTAL NAVIGATION
Provides students with an in-depth knowledge of coastal navigation, and the practical skills to enable them to perform the duties of an independent bridge watchkeeping officer. Students will undertake a more in-depth study of tide predictions and calculations on secondary ports, and basic principles and skills on passage planning using the Electronic Chart Display and Information System. The students will also be introduced to the work and duties of a junior navigating officer with respect to preparation of the chart folios, correction of charts and the use of various publications for the intended voyage.

MA0545/MA0556
METEOROLOGY
Students are taught about diverse weather patterns and their causes, taking and recording weather observations, and an appreciation of the planetary system of wind and pressure on the surface of the Earth. They will also study the working of various weather monitoring instruments used on-board.

MA0555
SHIP KNOWLEDGE
Students will be introduced to the basic concepts and principles necessary to develop related skills to be competent junior officers on board ship. There are two components in this module, theoretical ship knowledge which will introduce students to the key aspects of ship operations/maintenance and safety. This includes governing regulations, basic ship dimensions, various types of ships and their principal features, mooring operations and concepts involving lifting gear. The second component is ship stability, this component will introduce students to key terms, concepts and principles relating to a ship's stability at sea. This involves understanding both external and internal forces affecting ships stability and the ways of calculating ship stability in a range of conditions involving loading/discharging of weights on board.

MA0558
MARINE COMMUNICATIONS AND SIGNALS
Provides students with knowledge and skills in basic maritime communications. Provides students with knowledge and skills of traditional and modern methods of communications aboard ships. Signalling flags and Morse code will also be covered. The syllabus includes an in-depth knowledge of radar and automatic plotting aids and training will include hands-on simulation incorporating bridge watch-keeping and collision avoidance scenarios.

MA0559
ELECTRONIC NAVIGATION SYSTEMS I
Provides students with an understanding and a working knowledge of various electronic navigational systems/equipment found onboard merchant ships. Training will include hands-on simulation.

MA0560
COLLISION REGULATIONS
This module provides the students in-depth knowledge of the International regulations for Preventing Collisions at sea. The use of full mission simulators, computer-based training programmes and case studies will be used to lend practical application of the module. The module will also cover the buoyage regulations.

MA0561
MARINE OFFSHORE OPERATIONS
Provide students with a basic understanding of Marine Offshore operations. Students will be introduced to the various features and functions of offshore vessels employed in the trade. The module will also cover methods of geological surveys and the exploration process to facilitate the availability of oil and gas. Students will also be introduced to the concepts involving Dynamic Positioning systems.

MA0562
CARGO WORK & ISM
This module provides the students with a working knowledge of various types of cargo and their operations to enable the students supervise cargo operations aboard ships as a watch keeping cargo officer. Students will also be provided an overview of the International Safety Management System implement on-board ships.

MA0563
ELECTRONIC NAVIGATION SYSTEMS 2
Provides students with an deeper understanding and a working knowledge of various electronic navigational systems/equipment found on-board merchant ships. Training will include hands-on simulation. This module builds on Electronic Navigation Systems 1 taught earlier in year 2.

MA0564
GMDSS
Provides students with knowledge and operation skills in Global Maritime Distress and Safety System in accordance with IMO Model Course 1.25 and STCW 2010 amendments. This module is geared towards the Certificate of Competency for the General Operator's Certificate issued by the Infocomm and Media Development Authority of Singapore.

MA0565
SHIP CONSTRUCTION & SHIP STABILITY
This module provides students with a sound working knowledge of ship stability to ensure that ships under their charge are in a safe condition at all times. Particular emphasis will be placed on cargo distribution, its effects on ship construction and their stresses, the stability of the ship both at rest and in a seaway environment.

MA0568
BASIC TANKER TRAINING
This module combines the Basic Training in Oil and Chemical Tanker Cargo Operations and Basic Training for Liquefied Gas Tanker Cargo Operations. It is meant for officers and ratings assigned basic duties and responsibilities related to cargo or cargo equipment on board oil, chemical and gas tankers. It comprises a basic training programme appropriate to their duties, including basic training for oil, chemical and gas tanker safety, fire safety measures and systems, prevention and control of pollution, operational practice and obligations under applicable laws and regulations.

MA0570
BASIC OCCUPATIONAL SAFETY AND SECURITY TRAINING
Provides students with a sound knowledge of shipboard safety and to equip them with the necessary skills to take appropriate measures to safeguard the safety of personnel and ship. Students will be taught personal safety and social responsibility, survival-at-sea techniques, shipboard fire prevention and fire fighting, and elementary first aid in accordance with approved STCW requirements for the Basic Safety Training certificate. Students will also be introduced to the concept of a ship quality system and the ISM Code.

MA1051
PROJECT WORK
Provides students with an understanding of the methodology used in carrying out a project in which multi-disciplinary skills and knowledge are integrated and applied in a problem solving environment.

MA1061
WORKSHOP PRACTICE I
Provides students with basic practical skills and knowledge in Bench-fitting and Centre Lathe machine operation. The subject also aims to develop safety consciousness and proper work attitudes in the students. With the knowledge and practical skills gained students will be able to use workshop tools and carry out basic machining.

MA1064
WORKSHOP PRACTICE II
Provides students with basic knowledge and practical skills in Gas and Arc Welding. The module also aims to develop safety consciousness and proper work attitudes in students. With the knowledge and skills gained students will be able to perform simple welding jobs on board a ship.

MA1069
MARINE ENGINEERING KNOWLEDGE II
Provides students with further knowledge and understanding of the marine diesel engine and its auxiliary systems.

MA1071
INSTRUMENTATION
Provides students with a knowledge and understanding of different types of measuring instruments and transducers used in industry for automation and control. They will be introduced to simple industrial pneumatic and hydraulic systems.

MA1073
CAD
Provides students with the knowledge and skills to produce engineering drawings using a computer-aided drafting system.

MA1077
MARINE WORKSHOP PRACTICE
Students develop skills and confidence in overhauling marine machinery through a series of practical hands-on exercises in the marine workshop. With this knowledge and skills, the students will be able to carry out simple routine maintenance and basic repairs on ships' machinery. Safety at the workplace is also inculcated in the students.

MA1080
AUXILIARY MACHINERY
Provides students with an understanding of the construction and operating principles of various auxiliary machinery used in ships. Students learn to appreciate the integration of different equipment and auxiliaries to form a system. The management aspect of the system is also covered.

MA1082
INTEGRATED CONTROL
Provides students with the fundamentals of automatic shipboard control and alarm systems, and introduces basic knowledge in classical control theory for mathematical modelling and analysis of simple electrical and mechanical systems.

MA1084
SHIPPING BUSINESS
Provides students with an understanding of the economics of shipping business and its operation and practices. Financial accounting in a shipping environment is also covered.

MA1092
ELECTRONICS
Introduces students to basic analogue electronic devices with regards to their operation and applications. This knowledge will familiarise students with components used in control circuits of various systems used on board a ship.

MA1094
ELECTRICAL MACHINES AND SYSTEMS
Provides students with the knowledge and understanding of shipboard electrical machines and distribution systems. This will enable them to effectively contribute to the running, maintenance and fault diagnosis of electrical equipment.

MA1104
NAVAL ARCHITECTURE II
Builds upon the foundation given in the module Naval Architecture I to acquire further understanding of the principles in ship design and construction. It provides students with an understanding of intact and damaged ship stability, ship propulsion, sea keeping and manoeuvring, ship strength and ship structure.

MA1108
MARINE ENGINEERING KNOWLEDGE I
Provides students with the basic knowledge and understanding of the roles and responsibilities of marine engineers on ship operation. It also touched on the shipboard systems and provide foundation knowledge on machinery and equipment found in various types of ships currently in operation. Basic ship design will be covered in line with CDIO framework.

MA1112
BASIC OCCUPATIONAL SAFETY AND SECURITY TRAINING
Covers Personal Safety and Social Responsibility which familiarises students with the code of safe working practices on board a ship. The aspects covered include fire precaution, fire prevention and fire fighting. The training develops the students to react in a correct manner in the event of an outbreak of fire, to take appropriate measures for the safety of personnel and of the ship, and to use fire appliances correctly. The module covers Personal Survival Techniques which provides the students with the essential knowledge of types and handling of survival crafts, principles of survival and rescue techniques.

MA1113
APPLIED MECHANICS
Introduces students to the fundamentals of mechanics of bodies and systems and also provides them with the basic tools for analysing the static and dynamic behaviours of bodies and systems encountered throughout the course. It also teaches the basic concepts of strength of materials to assess the stress and strain on structural and engineering components.

MA1114
ELECTRIC CIRCUITS
Provides students with a sound knowledge of the fundamental principles of Electrical Technology. It supports further work in the course.

MA1115
BASIC THERMODYNAMICS
This is a foundation course on basic engineering principle of thermodynamics and provides an understanding of the First and Second Laws of Thermodynamics.

MA1116
ENGINEERING DRAWING
Provides students with the knowledge and understanding of Engineering Drawing Principles. They are required to produce isometric sketches, and assembly drawings of marine engineering parts.

MA1117
NAVAL ARCHITECTURE I
Provides students with an understanding of the basic concepts in ship geometry, flotation and transverse as well as longitudinal stability of a ship under various loading conditions.

MA1118
ENGINEERING MECHANICS
Builds on previous work done in Applied Mechanics. It introduces the principles of Strength of Materials which is applied to analyse the effects of bending and torsion on structures and engineering materials. This module also studies the flow characteristics of fluid in pumps and pumping systems. In addition, it deals with the dynamics of running machinery under load and the influence of mechanical vibration commonly encountered in engineering systems.

MA1119
INTEGRATED WORKSHOP PRACTICE
Provides students with the knowledge and skills in carrying out various workshop processes to fabricate sheet metal items, and overhaul and repair simple machinery parts. This module reinforces the basic skills and knowledge acquired in Workshop Practice I and II.

MA1120
APPLIED THERMODYNAMICS
Provides students with the understanding to apply the knowledge of thermodynamic laws and cycles, and heat transfer in piston air compressors, refrigerating and air conditioning plants, and combustion processes.

MA1121
MARINE ENGINE ROOM SIMULATION TRAINING
This module is to provide students with the knowledge and skills to operate, supervise and monitor the safe operation and control of a ship's propulsion plant machinery installation in accordance to the requirements of the STCW95 Code using practical sessions at the Marine Engine Simulator. Instruction is based on structured laboratory notes and series of practical exercises.

MA1124
MARINE POWER PLANTS
Provides students with the knowledge and understanding of the working principles, the constructional and design features and the safe operational practices of marine diesel engines, marine steam boilers and turbines, and gas turbines.

MA1125
NAVAL ARCHITECTURE DESIGN AND PROJECT
Provides students with outcome based learning from Naval Architecture modules using CNC, 3D and CAD to create a naval project.

MA1126
SOFTWARE APPLICATION FOR NAVAL ARCHITECTURE
This module is an introduction to the fundamentals of using a Naval Architecture and Shipbuilding computer application in ship design and production. It aims to provide students with the fundamental skills and knowledge in ship design and production, starting from initial design to hull production design.

MA2018
DISTRIBUTION AND TRANSPORTATION MANAGEMENT
Aims to provide students with knowledge on the activities involved in the movement of goods and provides a basic understanding on the technologies and practices in transportation management. Topics covered include roles of transportation in supply chain, distribution resource planning, channels in distribution, and protective packaging technology, unit loads, containers, and carrier compatibility, economics in transportation, transportation and customer service levels, and transportation infrastructure. Hands-on practice on Transportation Management is incorporated using ERP software package such as SAP.

MA2020
NAVIGATION
This module provides students with the knowledge and understanding of using the various electronic navigational equipment and systems found onboard merchant ships. With the knowledge and techniques gained, they are expected to effectively execute tasks in voyage planning; search and rescue; storm avoidance; being aware of the accuracy of the different types of position fixing; establishing watchkeeping arrangements and bridge team; and making landfall and navigating in pilotage waters. They are also expected to understand the concept, merits, limitations, precautions and siting arrangement of the different navigational systems.

MA2022
SHIP HANDLING & SIMULATOR
This module provides students with knowledge of good seamanship and shiphandling techniques and safety aboard ships, so that they will be able to effectively perform their duties as chief officer and/or master. In addition, the handling of vessels in the navigating bridge simulator would enhance the student's confidence and prepare them for the Orals examination. The syllabus also covers the Navigational Control Course (NCC) requirements.

MA2023
MARINE PLANT & PROPULSION
This module provides students with the theoretical knowledge required for deck officers at management level to understand the operating principles of marine power plants, ship's auxiliary machinery and a general knowledge of marine engineering terms, so as to enhance the safe operation of a ship.

MA2024
CARGOWORK
This module provides students with the knowledge, understanding and proficiency required of management level officers for the function of cargo handling and stowage. It covers international regulations and recommendations relating to the carriage of different types of cargo including dangerous and hazardous cargoes. Students are taught about the planning, loading, stowing, securing and the care of cargo during the voyage, which also covers the regulatory requirement in the maintenance of cargo equipment onboard.

MA2026
MARITIME LAW & PERSONNEL MANAGEMENT
This module provides students with knowledge of international conventions, regulations and recommendations which directly affect a ship's master in carrying out his obligations and responsibilities. Emphasis is placed on the master's legal obligations concerning the requirements for certificates and other documentation, survey requirements, provision for inspections by the master or an officer delegated by him and the maintenance of equipment and records. It also deals with the necessary basic knowledge of law concerning carriage of cargo and marine insurance.

MA2027
METEOROLOGY
This module provides students with the theoretical knowledge of maritime meteorology so as to enable them to take into account climatic conditions, weather prognosis, ocean currents and information on the presence of ice for the safe operation of the ship.

MA2028
COMPASS
This module provides students with knowledge of free gyroscope, gyro compass, magnetism and magnetic compass. Its emphasises the principles and practical use of the gyro and magnetic compass and the maintenance and limitations of these instruments.

MA2029
SHIP STABILITY
This module provides students with knowledge of ship stability, to ensure that ships under their charge are loaded in a safe manner. It deals with the effects of flooding of a compartment on the trim and stability of a ship and the counter measures that have to be taken in the interest of safety.

MA2030
SHIP CONSTRUCTION
This module provides students with knowledge of the principal structural members of a ship and the methods of construction, so that they are able to maintain and operate their vessel within the regulatory safe standards.

MA501B
LEADERSHIP AND TEAM WORK — HOW TO SUCCEED IN AN ORGANISATION
Provides students the basic structure/elements of a new work place. Learn about the dynamic of cross culture working environment. They will be trained in interpersonal skill and mental resilience to survive in adverse working condition. Most suitable for students who are preparing a sea career.

MA502B
MARINE BUSINESS
A generic skill training programme that aims at students from engineering but want to have some knowledge in business and finance. Using actual cases from marine industry, students will be taught how to start a business and grow it. Concept of SWOT analysis and forecasting will be covered.

MA5020
MARITIME ECONOMICS AND SHIPBROKING
This module incorporates the understanding of maritime economics and the business of ship broking, chartering and ship sale and purchase. The students will learn through working on a series of current ship chartering contracts, ship sale and new building contracts which includes the process of negotiating a charter party and related documentation, law and valuation of ships.

MA5021
MARITIME LAW AND INSURANCE
The aim of this module is to provide students with knowledge and understanding of the main principles of maritime law and the commercial, safety and environmental policies and values which underpin it. The module will also provide students with an understanding of marine insurance and how different aspects of marine insurance play a role in shipping.

MA5022
PORT AND CARGO MANAGEMENT

This module aims to provide a sound understanding of the basic elements in policy making, planning and management of ports and terminals with particular reference to the Port of Singapore. It also provides a broad knowledge of the handling, stowage and carriage of dry and liquid bulk as well as container management and safe transportation of dangerous goods. Basic elements in the operations of port agencies that include the understanding of shipping documentations, practices, disbursements and maritime fraud are also covered in this module.

MA5023
MARKETING AND FINANCIAL MANAGEMENT

This module will provide participants with a broad knowledge of Financial Management whose principles can be practically applied in shipping and ship management companies. Further, it will also provide a fundamental understanding of the financial tools and techniques that are used for/in shipping investments.

MA5024
SHIP MANAGEMENT AND OFFSHORE

This module aims to provide a thorough knowledge and understanding of ship management, an introduction to the offshore industry as well as ship surveys. In addition, it also covers commercial management which includes voyage estimations and responsibilities of an operations department.

MA5025
SUPPLY CHAIN MANAGEMENT

This module aims to provide a thorough knowledge and understanding of how supply chain management and distribution channels play an integral role in a firm's marketing strategy. The elements of a typical Supply Chain will be covered, including the important role of transportation within the Supply Chain Network.

MA5080
MARITIME ECONOMICS AND SHIPBROKING

This module incorporates the understanding of maritime economics and the business of ship broking, chartering and ship sale & purchase. The former aims to equip students with the knowledge and skills of economics and the commercial environment in which the shipping industry operates, including the factors that influence the supply and demand of shipping services. The latter will provide insights into the business of ship broking and chartering. Students will learn through working on a series of current ship chartering contracts, ship sale and new building contracts, which include the process of negotiating a charter party and related documentation, law and valuation of ships.

MA5081
MARITIME LAW AND INSURANCE

The aim of this module is to provide students with knowledge and understanding of the main principles of maritime law and the commercial, safety and environmental policies and values which underpin it. The students will be provided with the experience in dealing with legal principles deriving from variety of legal instruments, including international conventions, statutes and case law. The module will also provide students with an understanding of marine insurance and how different aspects of marine insurance play a role in shipping. Topics covered include functions of marine insurance in shipping, placing a risk in the market, Institute Hull and Cargo Clauses, General Average claims, P & I Club, and marine pollution protection schemes.

MA5082
PORT AND CARGO MANAGEMENT

This module aims to provide a sound understanding of the basic elements in policy making, planning and management of ports and terminals with particular reference to the Port of Singapore. Emphasis is placed on the ship-shore interface with regards to the planning and organization of resources to achieve optimum performance pertaining to container and bulk operations. It also provides a broad knowledge of the handling, stowage and carriage of dry and liquid bulk as well as container management and safe transportation of dangerous goods. Basic elements in the operations of port agencies that include the understanding of shipping documentations, practices, disbursements and maritime fraud are also covered in this module.

MA5083
MARKETING AND FINANCIAL MANAGEMENT

This module will provide participants with a broad knowledge of Financial Management where by principles can be practically applied in shipping and ship management companies. Further, it will also provide a fundamental understanding of the financial tools and techniques that are used in shipping investments. The topics would include areas of financial environment such as accounting & financial reporting, financial analysis, elements of costing and budgeting, investment appraisal and working capital management. The marketing element of the module will provide students with a basic knowledge of marketing, its role and its application in the shipping industry. Particular emphasis will be given to the characteristics of shipping services and their marketing implications for strategy development and implementation. A discussion of the role of Internet and marketing using the World Wide Web will also be discussed.

MA5084
SHIP MANAGEMENT AND SURVEYING

This module aims to provide a thorough knowledge and understanding of ship management, as well as ship surveys. Ship management deals with seaworthiness of vessels, which includes crew and technical management. Additionally, it also covers commercial management, which includes voyage estimations and responsibilities of an operations department. Ship surveys play an important role in the management of ships. This module will provide students with the concept and coverage of the various surveys, including the commercial aspects of on/off hire and bunker surveys.

MA5085
SUPPLY CHAIN MANAGEMENT

This module aims to provide a thorough knowledge and understanding of how supply chain management and distribution channels play an integral role in a firm's marketing strategy. The elements of a typical Supply Chain will be covered, including the important role of transportation within the Supply Chain Network. It also discusses the basic concept of supply chain management, the types of channel structures and the factors that influence channel designs, development and performance. The areas of Cold Chain Management, role of IT in Supply Chain Management, Customer Value in a supply chain and the aspects of Supply Chain Security will also be scrutinised.

MA5086
MARINE OFFSHORE OPERATIONS

This module aims to provide students with an overview of the offshore industry and related operations. The students will learn and appreciate the main types of international agreements on oil exploration and the various parties involved in the exploration. They will also learn the organizational structure of a typical offshore management company and the basic training requirements for offshore personnel. Particular emphasis will be placed on the operations of different types of vessels deployed for various purposes of offshore operations such as seismic survey, oil exploration/production and pipe laying.

MA8004
OPERATIONS AND INFORMATION MANAGEMENT
Provides students a foundation in the essential concepts of operations management, management science, statistics, and information systems. The primary focus of this module is on the analysis of business decisions and processes, supply chains, and effective use of quantitative methods and information technology to improve business operations.

MA8005
TRANSPORTATION MANAGEMENT
This module is an overview of the transportation sector, including transport authorities, operators, and commuters. It examines policy issues, such as electronic road pricing, along with managerial strategies in transportation. The students will also be equipped with the knowledge of ICT integration so as to meet the challenges of transportation systems.

ME0101
MECHANICS I
Introduces the basic concepts of engineering mechanics. Topics include units and dimensions, equilibrium conditions, friction, kinematics and Newton's laws of motion.

ME0102
MECHANICS II
Continues from Mechanics I. Teaches how basic solid mechanics is applied to solving engineering problems. The fundamentals of machine components are included.

ME0103
MECHANICS OF MACHINE ELEMENTS AND DYNAMICS
Covers the mechanics and dynamics of vehicles and mechanical systems. Topics include shaft balancing and vibration in machines.

ME0104
MECHANICAL ENGINEERING SYSTEMS
This module is a continuation of Mechanics I and Thermofluids I. It introduces to students the applications from basic ideas in solid mechanics to simple engineering problems, as well as fundamentals of machine components, air compressors and vapour cycles.

ME0201
COMPUTER AIDED DRAFTING
Introduces the use of computer-aided drafting (CAD) software to prepare mechanical engineering drawings. Topics include blue print reading, orthographic projection, sectioning, assembly drawing and basic solid modelling.

ME0202
ENGINEERING DESIGN AND PROTOTYPING
Applies the Design Thinking process to create new and innovative products or services. It also provides a platform to integrate theoretical knowledge from other modules by designing, testing and building practical and interesting projects. Teamwork, creativity, critical thinking and presentation skills are emphasised.

ME0203
ENGINEERING INNOVATION STUDIO
Requires students to explore a new engineering system or improve an existing system. The project based module covers modern tools and methods for ideation, design and development. Topics include identifying customer needs, concept generation, product architecture and evaluation of solutions developed.

ME0204
URBAN TRANSPORTATION DESIGN
Covers the structural design of land transportation vehicles. Application ranges from the chassis of the personal mobility device to the complex structures and mechanisms of a rapid transit system. Design topics covered include the car body, coupler and rapid transit trains.

ME0205
PRODUCT DESIGN & REALISATION
This module aims to equip students with a range of skills and techniques for creative product design and realisation. Students are taught foundation knowledge in product design such as Design Thinking, principles of 3D Design and how to use various computer tools to build up their skills in product visualisation. Students will also learn to present their designs in appropriate format using advanced Photoshop techniques.

ME0301
ENGINEERING MATERIALS I
Covers materials properties and test methods. Students are given broad-based knowledge of traditional materials like steel, aluminium, copper and polymer, and their processing methods and applications.

ME0401
THERMO-FLUIDS I
Introduces the fundamentals of thermodynamics, namely heat, work, perfect gas laws and the 1st law of thermodynamics. Use of steam tables, basics of pressure and flow rate in fluids, and the mass conservation law are also covered.

ME0402
THERMO-FLUIDS II
Provides further knowledge on thermodynamics and fluid mechanics with particular applications in air compressors, gas and vapour cycles.

ME0403
IN-VEHICLE SYSTEMS
Covers the requirements, design and operations of the sub-systems found in land vehicles. Topics include the air supply and air conditioning system, safety system and electrical wiring system.

ME0405/ME3421
REFRIGERATION AND AIR-CONDITIONING
Provides an understanding of the theoretical and practical refrigeration cycles and air-conditioning systems. Topics include the components and accessories, flow and cycling controls, heat load estimation, psychometrics, duct sizing and fan systems.

ME0501
AERONAUTICAL ENGINEERING SCIENCE
Introduces the principles of flight governing heavier than air flying machines. Topics include properties of the atmosphere, development of aerodynamic forces and moments, aircraft performance, and aircraft stability and control. High speed rotary wing flights are also taught.

ME0801
INDUSTRIAL ENGINEERING
Provides knowledge and skills in the basics of industrial engineering. Topics include work study, enterprise resource planning, scheduling and ergonomics. Concepts and techniques are also taught through hands-on practical sessions.

ME1021
INTRODUCTION TO ENGINEERING
Aims to promote interest in engineering by introducing the interdisciplinary nature of engineering systems and their manufacturing processes to the students. The students will acquire the skills for generating ideas using the Design Thinking process. Implementation and operation of an engineering system, is delivered through a build project. Their projects are presented in oral and written form.

ME1101
MECHANICS I
Introduces the basic concepts of engineering mechanics, namely units and dimensions, equilibrium conditions, friction, kinematics and Newton's laws of motion.

ME1201
COMPUTER AIDED DRAFTING
Introduces the use of computer-aided drafting (CAD) software to prepare mechanical engineering drawings. Topics include blue print reading, orthographic projection, sectioning, assembly drawing and basic solid modelling.

ME1301
ENGINEERING MATERIALS I
Covers materials properties and test methods. Students are given broad-based knowledge of traditional materials like steel, aluminium, copper and polymer, and their processing methods and applications.

ME1401
THERMO-FLUIDS I
Introduces the fundamentals of thermodynamics, namely heat, work, perfect gas laws and the first law of thermodynamics. Use of steam tables, basics of pressure and flow rate in fluids, and the mass conservation law are also covered.

ME2011
COMPUTER-AIDED MACHINING
Provides knowledge of computer-aided machining in milling and turning, including process planning techniques, machine coding and operational instructions. Training includes producing precision components.

ME2012
COMPUTER-AIDED MACHINING
Provides knowledge of computer-aided machining in milling and turning, including process planning techniques, machine coding and operational instructions. Training includes producing precision components.

ME2013
AIRCRAFT MAINTENANCE PRACTICES
Imparts hands-on skills and working knowledge for aircraft maintenance. Topics include sheet metal construction and repair, bonded structures, fastening devices, joining methods, control cables, pipes and hoses and safety precautions.

ME2021
DESIGN AND BUILD
Introduces the machine design and build process. Applications include computer modelling, selection of engineering components, assembly and commissioning of the machine.

ME2022
DESIGN AND BUILD MEDICAL DEVICE
Provides basic design and development knowledge of medical devices. Topics include design, development, ergonomics, selection of components and computer modelling. Hands-on lessons are conducted in assembly, trouble-shooting and commissioning of medical devices.

ME2101
MECHANICS II
Continues from Mechanics I. Teaches how basic solid mechanics is applied to solving engineering problems. The fundamentals of machine components are included.

ME2102
ASSISTIVE TECHNOLOGY AND REHABILITATION ENGINEERING
Applies engineering concepts to the design and development of assistive devices in the rehabilitation for people with disability or injury. Treatment, gait analysis and biomechanics are included.

ME2201
COMPUTER-AIDED DESIGN (AERONAUTICAL)
Imparts CAD skills using CATIA, the de-facto software used in the aerospace industry. Topics include solid modelling, surface modelling and sheet metal design in aerospace. Aircraft and assembly drawings are also generated.

ME2202
ENGINEERING INVENTIONS
Establishes the interdisciplinary links connecting mathematics and science to engineering disciplines. Projects are based on the works of builders from ancient Asia including Persia, India and China. After studying the design and construction tools behind these artefacts, project teams develop mathematical models to simulate them for replication using modern techniques.

ME2301
ENGINEERING MATERIALS II
Continues Engineering Materials I. Topics covered include failure of metals, corrosion, heat treatment of steels, non-destructive testing techniques including ceramics and composite materials.

ME2401
THERMOFLUIDS II
Provides further knowledge on thermodynamics and fluid mechanics with particular applications in air compressors, gas and vapour cycles.

ME2402
AIRCRAFT POWER PLANTS I
Introduces the working principle and construction of a piston engine. Topics include induction systems, cooling system, oil and oil systems, fuel and fuel system, ignition and starting systems, and ground operation.

ME2501
FUNDAMENTALS OF FLIGHT
Introduces the principles of flight governing heavier than air flying machines. Topics include properties of the atmosphere, development of aerodynamic forces and moments, aircraft performance, and aircraft stability and control. High speed rotary wing flights are also taught.

ME2511
AIRCRAFT STRUCTURES
Provides a basic knowledge of aircraft design and construction. Topics include the different types of fuselage construction, wings, empennage, flight controls and landing gear.

ME2601
INDUSTRIAL AUTOMATION
Provides knowledge of automated control operations in local manufacturing industries. Topics include pneumatics, relay control system, programmable logic controller, actuators and sensors.

ME2602
INSTRUMENTATION AND CONTROL
Provides fundamental knowledge of instrumentation, control theory and practical applications relevant to the local industries, including the installation and calibration of control instrumentation.

ME2801
INDUSTRIAL ENGINEERING
Provides knowledge and skills in the basics of industrial engineering. Topics include work study, enterprise resource planning, scheduling and ergonomics. Concepts and techniques are also taught through hands-on practical sessions.

ME2802
AIR LEGISLATION AND MANAGEMENT
Introduces Singapore's regulatory framework on aircraft maintenance and general management concepts. Topics include structure and management of aerospace organisations, and productivity and business performance.

ME3001
ADVANCED MACHINING AND METROLOGY
Imparts techniques in precision machining with CAD/CAM applications on 5-axis machines. Precision metrology equipment is used to measure dimensions.

ME301Y/ME301Z
PROJECT
Provides an opportunity to work in small groups to apply the knowledge and experience gained in their foundation stages to conceive, design, fabricate, test and commission a project. This include the opportunity to work with the industry on solving real-world problems.

ME3023/ME301M
ERGONOMICS AND UNIVERSAL DESIGN
Deals with the design of product and workspace to suit human dimensions and capabilities, including social and environmental impact. Product form and function are optimised with anthropometry, inclusive/universal design concepts and sustainable/green considerations.

ME3101/MM310M
MECHANICS III
Develops a basic understanding of material strength in the design of machine elements and structures. The module supports the design stage of the final-year project.

ME3102
BIOMECHANICS
Develops a basic understanding of applied mechanics in biological systems and human locomotion. Topics include function and physical properties of the musculo-skeletal system, biomechanical modelling, strength of materials, statics and dynamics.

ME3201/ME321M
TOOLING ENGINEERING
Applies knowledge and principles in tooling to solve problems or design fixtures for machining and inspection, as well as mould and die in large volume manufacturing. The latest technologies and materials in quality precision tooling are taught.

ME3222/MM320M
PRODUCT DESIGN AND DEVELOPMENT
Provides a range of skills and techniques for creative product design and realisation. Basics include Design Thinking, principles of 3D Design and various computer tools for visualisation.

ME3301 /MM331M
AEROSPACE MATERIALS
Provides an understanding of factors governing the selection of materials for the various aircraft structural members and engine components. Topics include extraction, production and fabrication of advanced materials such as aluminium alloy, titanium alloy, super alloys and ceramics.

ME3303
BIOMATERIALS
Develops an understanding of materials used in a medical environment. Topics include implants and tissues, processing and characterisation of the materials, and compatibility with human bodies.

ME3401/MM340M
ENGINEERING THERMODYNAMICS
Provides further knowledge of steam cycles and gas turbine cycles, steam nozzles and heat transfer.

ME3402
AIRCRAFT POWER PLANTS II
Introduces the working principle and construction of a jet engine. Topics include fuel, oil and air systems, thrust reverser, ignition, starting, engine instruments, controls and engine operations, and auxiliary power units.

ME3422/ME341M
RENEWABLE ENERGY AND APPLICATIONS
Provide an understanding and practical knowledge of renewable energy and its applications. Topics include solar energy, wind energy and tidal energy.

ME3501
FLUID MECHANICS
Provides knowledge on fluid flow and piping systems, centrifugal and positive displacement pumps as well as industrial hydraulics.

ME3503
CONTAMINATION CONTROLS & CLEAN ROOM
Provides knowledge about contamination control and cleanroom technology, and the pharmaceutical cleanroom classifications. Topics include basic design of various cleanliness classes, pressure differential, airlocks, entry and exit protocol, and aseptic processing.

ME3504
BIOFLUIDS
Covers physiology of the circulatory and pulmonary systems with engineering of fluid mechanics. Major topics include blood rheology, mechanics of heart and its valves, hemodynamics and regulation of organ blood flow, air flow in lungs, microcirculation, and common disorders and medical devices associated with the two body systems.

ME3531/ME351M
AIRCRAFT SYSTEMS
Provides a full understanding of aircraft systems. Topics include pumps, compressors, landing gear, flight control, air conditioning, pressurisation, fire/oxygen/ice/rain protection, fuel, water and waste.

ME3601
PROGRAMMABLE LOGIC CONTROLLERS
Provides fundamental concepts and examples to understand the operation and capabilities of programmable logic controllers as an important tool for factory automation. Simple control strategies using ladder diagram are implemented.

ME3602
ROBOTICS INTEGRATION AND PROGRAMMING
Introduces the basics of robot hardware, software and their integration. Topics include micro-controller, display components, actuators and sensors. Students will get to design, build and test an autonomous robot system.

ME3801
QUALITY ENGINEERING AND MANAGEMENT
Provides basic concepts of quality management, ISO 9001:2008 Quality Management System and inspection and quality improvement techniques.

ME3802
QUALITY MANAGEMENT (AERONAUTICAL)
Provides basic concepts of quality management, ISO 9001:2008 Quality Management System and techniques of inspection and quality improvement.

ME3803
HUMAN FACTORS
Imparts the concepts of human factors that affect performance in aviation and aircraft maintenance applications include error management techniques to reduce human error mishaps.

ME3831
SYSTEM INTEGRATION
Introduces the principles of system integration. Teaches how human and machines are interface using logic controllers, sensors and motion systems.

ME3901
FACILITIES MAINTENANCE ENGINEERING AND SERVICES
Examines the mechanical principles of thrill-experience activities in resorts. Typical facilities include vertical transportation, lighting, water supply and sanitation. Maintenance of joy rides, life-safety concepts and energy monitoring are taught with emphasis on environmental considerations.

ME8001
ORGANISATIONAL MANAGEMENT
Imparts the concepts of organisation structure and management in terms of performance and productivity. Topics include structure and development, roles and functions, motivating people, leadership, communication skills, group dynamics, teamwork and the business environment.

ME8002
WORKPLACE SAFETY & HEALTH MANAGEMENT
Provides an appreciation of the safety and risk management inherent in resorts and mega buildings. The Workplace Safety and Health Act, related statutory legislations, risk assessment and hazards analysis are covered.

ME8003
CGMP AND MEDICAL DEVICE VALIDATION
Introduces current Good Manufacturing Practice in the design and manufacturing of medical devices and pharmaceuticals. Intellectual property protection, patent filing, FDA and related regulatory guidelines are covered with emphasis on non-compliance implications.

MM0311
WIND ENERGY SYSTEMS
This module covers the fundamentals of wind energy as used in electricity generation. It includes wind measurement, aerodynamics, loads on turbine blades, power generation, resource allocation, and environmental impact. It will provide students with knowledge of siting of wind turbines and the use of wind energy for electricity generation.

MM1213
ENGINEERING INNOVATION STUDIO
Designs a new engineering system with a project-based curriculum. Topics include modern tools and methods for design and development, identifying customer needs, concept generation, product architecture and design, and implementation.

MM303M
PARTS DESIGN
Provides an understanding of plastic and sheet metal part design for manufacturing. Importance of geometrical dimensioning and tolerance are also covered.

MM304M
LEARNING EXPRESS
Applies engineering skills to solve real world problems. Integrated hands-on learning includes field trips to understand human needs before developing feasible engineering solutions.

MM311M
AIRCRAFT DYNAMICS AND CONTROL
Introduces the basic elements of flight dynamics and control theory as applied in aircraft design and response.

MM3208
PRODUCT DESIGN AND REALISATION
Provides a range of skills and techniques for creative product design and realisation. Topics include foundation knowledge in product design such as Design Thinking, principles of 3D Design and the use of computer tools for product visualisation. Presentation of design in appropriate format is taught using advanced Photoshop techniques.

MM321M
AEROSPACE COMPONENTS MANUFACTURING
Uses CATIA Computer Aided Manufacturing to generate tool paths for machining 2D and 3D components on a CNC milling machine.

MM332M
DESIGN COMMUNICATION AND ILLUSTRATION
Provides an overview on the evolution of industrial design and graphical tools that create professional presentation materials. Practical skills include manipulating graphical contents, typography, colour palettes and layout to highlight visual information.

MM370M
PLANT MAINTENANCE ENGINEERING
Develops a basic understanding of how equipments should be managed and maintained in an operational and safe working condition.

MM387M
FINITE ELEMENT METHODS
Teaches the basics of discrete-event simulation of dynamic systems with stochastic behaviour. Applications include computer-aided engineering analysis of mechanical behaviour under given boundary conditions and loadings.

MM6103
THE AIRLINE INDUSTRY
This module aims to equip students with the basic understanding of the volatile aviation landscape and how difficult aviation situations could be managed. This module also provides students with fundamental knowledge of management concepts that are essential in capitalising on the benefits of business transportation.

MM6104
TERMINAL OPERATIONS & MANAGEMENT
This module discusses the challenges of running a competitive airport terminal and difficulties faced by airport operators and their ground handling agents.

MM6105
RAMP OPERATIONS AND MANAGEMENT
This module focuses on the complexities of the airside environment as well as how to better manage airside operations and safety.

MM9101
COMPUTER-AIDED DRAFTING
This module provides the knowledge of interpreting and preparing engineering drawing of mechanical parts based on ISO Standard recommendations. The module will provide students with knowledge in blue print reading, orthographic projection, sectioning and dimensioning of mechanical components and parametric modeling of mechanical devices which are key elements of engineering graphics communication. Participants will be able to use Computer-Aided Drafting & Design (CADD) software to create parametric solid models of mechanical parts.

MM9102
COMPUTER-AIDED DRAFTING AND DESIGN
Uses Computer-Aided Drafting and Design (CADD) software to create parametric assembly models of mechanical devices, generate assembly drawings and detailing with appropriate limits, fits and geometrical tolerances based on ISO Standard recommendations.

MM9103
MACHINE ELEMENTS AND MECHANISMS DESIGN
Introduces the application of limits and fits, geometrical dimensioning and tolerances for controlling size and form of parts to meet design functions. Topics include design and selection of standard engineering machine elements such as locking and fastening devices, bearing, gear-drives, belt-drives and chain-drives required in mechanical systems.

MM9200
INDUSTRIAL AUTOMATION
Provides the fundamental knowledge and hands-on skills in pneumatic relay control system and Programmable Logic Controller (PLC) relevant to the local industries. Topics included will develop the ability to design and assemble automatic control circuits.

MM9201
MACHINE ASSEMBLY PROCESS
Provides the knowledge, techniques and skill sets required of engineers in mechanical assembly processes. Topics include interpretation of drawings, billing materials, project planning, quality assessment of parts and assembly techniques. A range of assembly tools will be used.

MM9202
MECHANICS OF MACHINE ELEMENTS
Introduces the analysis of stress and strain in bodies under static equilibrium and basic dynamics. Applications include the design of machine and structural elements.

MM9303
INSTRUMENTATION AND CONTROL
Provides fundamental knowledge of instrumentation, control theory and basic practical knowledge on process control applications relevant to the local industries. At the end of the course, students will have some basic skills on the design and maintenance of industrial process control systems.

MM9304
THERMOFLUID SYSTEMS
Provides a strong foundation in Thermodynamics and Fluid Mechanics. Topics covered include fluid mechanics, perfect gas and steam. The module is practice-based and lectures are supplemented by comprehensive tutorials. Hands-on laboratory classes reinforce concepts and develop robust practical skill sets.

MM9305
THERMOFLUID POWER
Provides fundamental knowledge and basic principles in the second law of thermodynamics, thermodynamic power cycles, air compressors, conservation of momentum and conservation of energy. Hands-on laboratory classes reinforce concepts and develop robust practical skill sets.

MM9306
ENGINEERING THERMODYNAMICS
Provides basic knowledge in heat transfer, combustion, steam nozzles, steam turbine cycles and gas turbine cycles. Key concepts and principles introduced in lectures are consolidated by descriptive and calculation questions in tutorials.

MM9400
STATICS AND DYNAMICS
Provides basic concepts in applied mechanics. Topics include units and dimensions, equilibrium conditions, friction, kinematics and Newton's laws of motion.

MM9401
MECHANICS OF MATERIALS AND MACHINES
Continues from Machine Elements and Mechanisms Design. Topics include direct stress and strain, bending, torsion, moment of inertia, work and power. Applications include simple engineering structures and lifting machines.

MM9402
ENGINEERING MATERIALS
Introduces basic properties and applications of general engineering materials such as steel, cast iron, aluminium, copper, thermo-setting and thermo-plastics. Practical skills include mechanical testing, common Non-Destructive Testing (NDT), metallographic techniques, heat treatment of metallic materials and casting processes.

MM9500
CNC TURNING TECHNOLOGY
Provides working knowledge of CAD/CAM programming and CNC machining for turning. Selection of appropriate machining parameters to achieve part specifications will be discussed.

MM9501
CNC MILLING TECHNOLOGY
Provides working knowledge of CAD/CAM programming and CNC machining for milling. Selection of appropriate machining parameters to achieve part specifications will be discussed.

MM9502
ADVANCED MACHINING PROCESSES
Provides an integral approach to parts and components machining. Topics include job planning, work holding, tool selection and advanced machining processes. Multi-axis machining is introduced.

MM9700
ENGINEERING DRAWINGS
Provides knowledge and skills to interpret engineering drawings of mechanical parts, welded structures and assemblies, in accordance with the ISO standards.

MM9701
FAILURE ANALYSIS & NON-DESTRUCTIVE TESTING
Introduces how materials might fail and how to conduct basic non-destructive inspection to assess the strength and integrity of mechanical structures. The non-destructive techniques encompass borescope, liquid penetrant, magnetic particle, radiography, ultrasonic and eddy current inspection.

MM9702
ENGINEERING MATERIALS
Introduces the properties and applications of common engineering materials used in the rail transport industry such as steels, aluminium and its alloys, polymers and composites. Mechanical testing methods and metallurgical processes such as heat treatment and corrosion are also covered.

MS010Q
BRIDGING MATHEMATICS
This is a bridging mathematics module for ITE upgraders who are in their first year of studies in SP. It is designed to be fully integrated with the Basic Mathematics module. The focus is to equip students with fundamental mathematical skills. Topics include algebra, functions and their graphs, exponential and logarithmic functions, trigonometry and calculus. It also serves as a foundation for subsequent mathematics modules.

MSIOOQ
ENGINEERING MATHEMATICS I
Equips students with the necessary mathematical knowledge and skills to solve problems encountered in their course of studies. It also serves as a foundation for more advanced topics in Year 2. Topics include determinants,matrices, complex numbers and calculus.

MS0105
MATHEMATICS
Equips students with knowledge in mathematics and analytical skills to solve problems related to infocomm technology. Topics include matrices, linear transformation, number systems, set theory, logic, Boolean algebra, techniques of counting and probability.

MS011Q
BRIDGING MATHEMATICS I
This is a bridging mathematics module for ITE upgraders who are in their first year of studies in SP. It is designed to be fully integrated with the Engineering Mathematics I module. The focus is to equip students with fundamental mathematical skills. Topics include determinants, matrices, complex numbers and calculus.

MS0151
MATHEMATICS FOR GAMES
Equips students with knowledge in mathematics and analytical skills to solve problems related to their course of study. Topics include matrices, linear transformation, number systems, set theory, logic, Boolean algebra, techniques of counting and probability

MS020Q
BRIDGING MATHEMATICS II(A)
Provides second-year direct entry students from ITE with the necessary mathematical knowledge and skills in algebra, differential calculus and statistics. It serves as a bridging module to Year 2 Engineering Mathematics.

MS021Q
BRIDGING MATHEMATICS II(B)
Provides second-year direct entry students from ITE with the necessary mathematical knowledge and skills in differential calculus, integral calculus and ordinary differential equations. It serves as a bridging module to second-year Engineering Mathematics.

MS0229
BUSINESS STATISTICS
Provides students with an understanding of basic statistical concepts and their relevance in business. Topics covered include descriptive statistics, probability distributions, sampling, estimation, hypothesis testing, analysis of variance, and linear regression. Statistical software is introduced and is used to reinforce the learning of statistical concepts.

MS1100
BUSINESS STATISTICS
Provides students with an understanding of basic statistical concepts and their relevance in business. Topics covered include descriptive statistics, probability distributions, sampling, estimation, hypothesis testing, analysis of variance, and linear regression. Statistical software is introduced and is used to reinforce the learning of statistical concepts.

MS1381
MATHEMATICS FOR BUSINESS
Introduces the students to basic concepts of algebra and calculus and how these are used to solve problems in business and economic applications. This module is for students who do not have O-Level Additional Mathematics background.

MS1522
IT AND DATA ANALYSIS FOR BUSINESS
Provides students with the essential features of spreadsheet to support data analysis for business applications. Topics covered include spreadsheet, fundamental data analysis, professional presentations and proper documentation.

This module will impart the necessary skills to analyse worksheet data, apply fundamental data analysis techniques to improve productivity and streamline their day-to-day operational work. Equipped with these fundamentals, students will be able to apply these skills to construct business and financial models for today's fast changing business environment.

MS2101
MATHEMATICS A
Provides students with an adequate knowledge of mathematics and analytical skills to handle the problems encountered in their course of study. The topics include algebra, descriptive statistics, matrices and trigonometry. Students also learn how to use spreadsheet software.

MS2103
MATHEMATICS B
Equips students with an adequate knowledge of mathematics and analytical skills to handle the problems encountered in their course of study. The topics include differentiation, partial differentiation, integration, numerical methods, first-order differential equations and their applications. Students also learn how to use mathematical software.

MS2125
BASIC MATHEMATICS
Equips students with basic mathematical knowledge and skills in algebra, trigonometry and calculus to enable them to understand and solve engineering problems encountered in their course of study. It also serves as a foundation for subsequent mathematics modules.

MS2128
ENGINEERING MATHEMATICS I
Equips students with the necessary mathematical knowledge and skills to solve problems encountered in their course of study. It also serves as a foundation for more advanced mathematics in Year 2. Topics include determinants, matrices, complex numbers and calculus.

MS2223
ENGINEERING MATHEMATICS II(A)
Equips students with further mathematical knowledge and skills so as to strengthen their capability in analysing and solving their engineering problems. The topics include integration, Simpson's rule, first and second-order differential equations, Laplace transforms and their applications. Students also learn how to use mathematical software.

MS2224
ENGINEERING MATHEMATICS II(B)
Equips students with mathematical and statistical skills needed to solve relevant engineering problems encountered in their course of studies. Topics covered include determination of laws, partial differentiation, matrices, statistics and applications. Students also learn how to use statistical software.

MS2231
BIOSTATISTICS
This module aims to provide students with the basic concepts in descriptive and inferential statistics. The topics covered include descriptive statistics, random variables and probability distributions, sampling distributions, statistical inference, analysis of variance, and correlation and regression analysis. A statistical software will be used throughout for hands-on exercises.

MS2232
MECHANICS OF MATERIALS
Provides students with basic knowledge in mechanics of materials. Topics include equilibrium of forces, stress and strain relationship, thermal stress, axial stress, analysis of bending stress in beams and deflection of beams. Students will also be exposed to experimental methods.

MS2237
ENGINEERING MATHEMATICS II
Builds on topics in the first year of study and provides students with further mathematical knowledge and skills. Topics covered include Newton's method, partial differentiation, integration methods, Simpson's rule, and first and second order differential equations and their applications. Students also learn how to use mathematical software.

MS2302
STATISTICAL DATA ANALYSIS
This module introduces the concepts and methods of statistical data analysis using a statistical tool such as Minitab with emphasis on interpretation of results. Topics include review of descriptive statistics, fundamental of sampling distributions and continuous probability distributions, concepts of inference and hypothesis testing, regression and correlation, analysis of variance and factorial experiments, and statistical quality control.

MS3123
BASIC MATHEMATICS
Equips students with basic mathematical knowledge and skills in algebra, trigonometry and calculus to enable them to understand and solve engineering problems encountered in their course of study. It also serves as a foundation for subsequent mathematics modules.

MS3129
ENGINEERING MATHEMATICS I
Equips students with the necessary mathematical knowledge and skills to solve problems encountered in their course of study. It also serves as a foundation for more advanced mathematics in Year 2. Topics include, determinants, matrices, complex numbers and calculus.

MS3229
ENGINEERING MATHEMATICS II
Builds upon the mathematical knowledge and skills acquired in Year 1. Topics covered are inferential statistics, partial differentiation, solving of first and second order differential equations, and their applications. Students also learn how to use statistical software.

MS3511
IT AND DATA ANALYSIS FOR BUSINESS
Provides students with the essent ial features of spreadsheet to support data analysis for business applications. Topics covered include spreadsheet applications, fundamental data analysis, professional presentations and proper documentation. This module will impart the necessary skills to analyse worksheet data, apply fundamental data analysis techniques to improve productivity and streamline their day-to-day operational work. Equipped with these fundamentals, students will be able to apply these skills to construct business and financial models for today's fast changing business environment.

MS4120
BASIC MATHEMATICS
Equips students with the basic mathematical knowledge and skills in algebra, trigonometry and calculus to enable them to understand and solve engineering problems encountered in their course of study. It also serves as a foundation for subsequent mathematics modules.

MS4121
ENGINEERING MATHEMATICS I
Equips students with the necessary mathematical knowledge and skills to solve problems encountered in their course of studies. It also serves as a foundation for more advanced topics in Year 2. Topics include determinants, matrices, complex numbers and calculus.

MS4205
ENGINEERING MATHEMATICS II(A)
Provides students with further knowledge in mathematics and analytical skills to solve engineering problems encountered in their course of studies. Among the topics covered are Laplace transforms and statistics.

MS4206
ENGINEERING MATHEMATICS II(B)
Provides students with further knowledge in mathematics and analytical skills to solve engineering problems encountered in their studies. Among the topics covered are methods of integration, infinite series, Fourier series, differential equations and vector algebra.

MS4941
ENGINEERING MATHEMATICS
Provides students with essential mathematical techniques for solving problems in electrical engineering. Emphasis is placed on numerical methods, practical applications. Topics covered include various transform methods, matrices, descriptive statistics, hypothesis testing, vector algebra, numerical methods of solving differential equations, difference equations.

MS6140
BASIC MATHEMATICS
Equips students with basic mathematical knowledge and skills in algebra, trigonometry and calculus to enable them to understand and solve engineering problems encountered in their course of study. It also serves as a foundation for subsequent mathematics modules.

MS6161
ENGINEERING MATHEMATICS I
Equips students with the necessary mathematical knowledge and skills to solve problems encountered in their course of study. It also serves as a foundation for more advanced mathematics in Year 2. Topics include determinants, matrices, complex numbers and calculus.

MS6231
BIOSTATISTICS
Provides students with the basic concepts in descriptive and inferential statistics. The topics covered include descriptive statistics, random variables and probability distributions, sampling distributions, statistical inference, analysis of variance, and correlation and regression analysis. A statistical software will be used throughout for hands-on exercises.

MS6260
ENGINEERING MATHEMATICS II(A)
Provides students with further knowledge in mathematics and analytical skills to solve engineering problems encountered in their studies. Among the topics covered are analytical geometry, matrices, calculus, series and statistics.

MS6261
ENGINEERING MATHEMATICS II(B)
Provides students with further knowledge in mathematics and analytical skills to solve engineering problems encountered in their studies. Among the topics covered are calculus, ordinary differential equations and Laplace transforms of functions involving discontinuities.

MS6262
ENGINEERING MATHEMATICS II
Provides students with further knowledge in mathematics and analytical skills to solve engineering problems encountered in their studies. Among the topics covered are calculus, ordinary differential equations, Laplace Transforms of Functions and series.

MS6508
COMPUTER PROGRAMMING
Teaches students the methodology of good program development. The C++ language will be used to write structured programs according to accepted programming practices. Topics covered include simple data type, input/output, control and loop structures, functions and arrays. Programming and hands-on training will be emphasised.

MS7102
BASIC MATHEMATICS
Equips students with basic mathematical knowledge and skills in algebra, trigonometry and calculus to enable them to understand and solve engineering problems encountered in their course of study. It also serves as a foundation for subsequent mathematics modules.

MS7124
BUSINESS STATISTICS
Provides foundation for students to be equipped with quantitative skills, understanding of basic statistical concepts and their relevance in business. It is designed to train students with the statistical research skills from data analysis through manual means and software, data representation and interpretation that will allow them to make informed decisions. The statistical problem-solving process is taught as a method in addressing business-related statistical problems. Topics covered include descriptive statistics, probability distributions, sampling, estimation, hypothesis testing, analysis of variance, and linear regression.

MS7141
MATHEMATICS I
Provides students with mathematical skills, knowledge and understanding required for their present course of study. Topics covered include basic algebra, geometry, trigonometry, plane and spherical triangles and their applications.

MS7142
MATHEMATICS AND SCIENCE I
Provides the students with adequate knowledge of mathematics and science to enable them to learn other modules in the chief mate special limit course (phase 1). Topics covered in mathematics include algebra, geometry and trigonometry. The topics covered in science are motion in a straight line under constant acceleration, work, energy and power, moments and centre of gravity, simple machines and hydrostatics.

MS7202
ENGINEERING MATHEMATICS I
Equips students with the necessary mathematical knowledge and skills to solve problems encountered in their course of study. It also serves as a foundation for more advanced mathematics in Year 2. Topics include determinants, matrices, complex numbers and calculus.

MS7224
BUSINESS DATA ANALYTICS
Students will be equipped with statistical and data literacy skills that will enable them to interpret data critically.They willdevelop an appreciation for the different areas of analytics,a proficiency in using visualization tool,and decision-making skills for business-related problem.

MS7302
ENGINEERING MATHEMATICS II
Provides students with more knowledge and skills in mathematics. Topics covered include advanced methods of integration, differential equations, statistics and probability which support the analytical requirements of other modules in the course.

MS7341
MATHEMATICS II
Gives students a good grounding in the mathematics necessary for obtaining a Class 3 Certificate of Competency. Topics covered include mensurations, graphical methods and plane and spherical trigonometry.

MS7342
MATHEMATICS AND SCIENCE II
This module is designed to provide students with a good grounding in mathematics and applied science necessary for obtaining a Certificate of Competency (Chief Mate Special Limits). Topics covered in mathematics include mensuration, trigonometry applied to navigation, and graphs. The topics covered in applied science are heat, sound, static electricity, magnetism, electromagnetism, corrosion and gyroscope.

MS7442
SCIENCE I
Provides students in nautical studies with basic knowledge and problem-solving skills in mechanics, hydrostatics and properties of matter. Topics include vectors, moments, energy, work, power, principle of floatation and strength of materials.

MS7452
APPLIED SCIENCE
Provides students with knowledge in applied science necessary for deck officers. Application of knowledge and problem solving skills form a major part of this module. Topics covered include heat, sound, electricity, electromagnetism, magnetism, principle of the gyroscope and corrosion prevention.

MS7524
IT & DATA ANALYSIS FOR BUSINESS (ITDAB)
Provides students with the essential features of spreadsheet to support data analysis for business applications. Topics covered include spreadsheet applications, fundamental data analysis, professional presentations and proper documentation. This module will impart the necessary skills to analyse worksheet data, apply fundamental data analysis techniques to improve productivity and streamline their day-to-day operational work. Equipped with these fundamentals, students will be able to apply these skills to construct business and financial models for today's fast changing business environment.

MS7542
SOFTWARE APPLICATIONS
Provides students with a good understanding of the use of microcomputers. Students will learn and have sufficient hands-on practical exercises in industry standard application software for word processing, spreadsheet and database management. On completion of this module, students should have gained enough knowledge, experience and confidence to explore other application software on their own.

MS801M
ADVANCED MATHEMATICS I
Provides students with a sound foundation in calculus essential for studies in engineering courses at the university level. Topics include functions and graphs, limits and continuity of functions, differentiation, integration and its geometrical applications, indeterminate forms, improper integrals and complex numbers.

MS802M
ADVANCED MATHEMATICS II
Provides students with further knowledge in calculus and basic knowledge of vectors and linear algebra essential for studies in engineering courses at the university level. Topics in the module include mathematical induction, sequences, infinite series and power series, vectors, lines and planes in space, matrices, determinants, systems of linear equations, eigenvalues and eigenvectors.

MS803M
ADVANCED MATHEMATICS III
Equips students with a further knowledge in calculus and differential equations considered essential for studies in engineering courses at the university. Topics include polar coordinates, parametric equations, multiple integrals, partial derivatives and their geometric significance and applications, vector-valued functions, ordinary differential equations (first order and second order), Laplace transforms and its applications in initial value problems and Fourier Series.

MS837M
FURTHER MATHEMATICS
Provides students with essential mathematical knowledge for further studies in universities. Topics covered include mathematical induction, functions, quadratic and cubic equations, inequalities, sequences and series, complex numbers, methods of integration, parametric equations and the applications of differentiation and integration.

MS8505
OBJECT-ORIENTED DEVELOPMENT
Introduces the concepts of class design and equips students with fundamental object-oriented development skills. The C# Programming language is used as a vehicle to demonstrate encapsulation, inheritance, polymorphism and interfaces using the object-oriented paradigm.

MS8506
.NET APPLICATIONS
Prepares students to do client server development in the .NET framework. It covers essential development details with regards to graphical user interface development and accessing database using ADO.NET. It also provides a brief introduction to Internet application development using ASP.NET.

MS8510
SPREADSHEET PROGRAMMING AND DATABASE MANAGEMENT
Equips students with the fundamentals of spreadsheet programming and concept of database management. Students will be taught VBA in Excel for application development. In addition, an understanding of database concepts and the use of MS Access to develop database applications will be demonstrated.

MS8511
C# PROGRAMMING
Covers the fundamental aspects of computer programming using the C# programming language in the NET framework. Students will be taught the various constructs of the language such as data types, input/output, control and loop structures, functions arrays and string handling. On completion of this module, students will have gained adequate knowledge to use the language for object-oriented program development.

MS861M
HIGHER MATHEMATICS I
Provides students with a sound foundation in differential calculus and its applications which are essential for further studies at institutions of higher learning. Topics include solution set of inequalities, polynomial equations, functions and graphs, limits and continuity, derivatives of functions, rates of change and optimisation.

MS862M
HIGHER MATHEMATICS II
Equips students with knowledge in limits, continuity, integral calculus and some of its applications, and solutions of first order ordinary differential equations.

MS863M
HIGHER MATHEMATICS III
This module aims to equip polytechnic graduates with essential mathematical knowledge for further studies at degree level in a university. It is also designed to bridge some of the gaps between the calculus at the polytechnic diploma level and the calculus at the first year university level. Topics include principle of mathematical induction, absolute value functions, improper integrals, sequences and series, complex numbers, parametric equations and polar co-ordinates in analytic geometry, vectors in R2 and R3 and solution of system of linear equations.

MS864M
PHYSICS
Provides students with a good foundation in physics for further studies in universities. Topics covered include physical quantities and units, kinematics, dynamics, oscillations, waves, electricity, magnetism and electromagnetism. The extensive use of vectors and calculus in developing concepts allows the students to see how mathematics is used as a concise language of physics.

MS9001
INTRODUCTION TO STATISTICS FOR DATA SCIENCE
This module provides students with an introduction to elementary probability theory and statistical concepts and principles that lay the foundation to understand and learn the statistical procedures and methods in the subsequent modules. The topics covered include descriptive statistics, rules of probability, probability distributions of discrete and continuous random variables, sampling distributions, and statistical estimation.

MS9002
DATA MINING TECHNIQUES
This module teaches students key concepts in data mining, including data exploration, data preparation, and model building. Students will learn how to prepare data from multiple sources, and develop classification models for applications such as direct marketing and customer retention. Modelling techniques covered include k-nearest neighbours, logistic regression, classification trees, and neural networks. Students will also learn to use unsupervised methods in areas such as finding associations between products that are often purchased together, and segmenting customer data to identify important market segments.

MS9003
APPLIED STATISTICAL METHODS
This module equips students with the statistical procedures and methods commonly used in the analysis of information and data in industry. The coverage specifically discusses analysis techniques necessary for multivariate data. Topics include matrix algebra, analysis of variance, multivariate statistical analysis, principal component analysis, factor analysis, discriminant analysis and cluster analysis.

MS9004
INTRODUCTION TO STATISTICAL MODELLING
This module covers the theory and applications of statistical data modelling techniques. The module aims to equip students with good knowledge of the underlying theory, assumptions and applications of the techniques in statistical data modelling. Students will be exposed to the least squares theory required for modelling work. They will learn how to deal with various types of data using simple linear models, models for heteroscedastic data, model diagnostics, adequacy, comparison and building techniques as well as essentials of statistical simulation. Students will also be exposed to ideas of experimental design and system optimization in modelling work.

MS9005
GENERALISED MODELLING AND FORECASTING
This module aims to equip students with a greater breadth of skills in Predictive Analytics. It aims to build predictive analytics skills in the modelling of: i) data with non-Gaussian distributions, ii) data of Gaussian but heteroscedastic structure, iii) categorical data and iv) time-series data. Topics covered in the module include generalised linear models with a focus on Poisson and Gamma data, heteroscedastic regression with a focus on the generalised least squares approach, generalised estimating equations, analysis of categorical data with models for nominal and ordinal responses. The last part of the module focuses on analysis of time series data and discusses smoothing techniques, linear stationary and non-stationary models, model identification, estimation, diagnostics and forecasting.

MS960Y/Z
FOUNDATION MATHEMATICS

This module aims at equipping students with basic mathematical knowledge that would be useful and relevant for a wide range of applications in their course of studies. The topics covered include algebra, trigonometry, geometry, matrices and statistics. Students will also be taught to solve problems through the use of graphing and statistical software. The emphasis will be placed on the acquisition and mastery of algebraic concepts, graphical representations, interpretation of solutions as well as skills in mathematical problem-solving.

MS9700
FUNDAMENTALS OF INFORMATION TECHNOLOGY

Provides students with the knowledge and skills of integrating and applying the electronic spreadsheet tools to support data analysis, statistical techniques and managing digital information sources.

This module also will enhance the students' communication and writing skills by equipping them with the essential word processing and digital presentation skills, which they can later apply in their coursework and projects. This module also covers simple programming concepts.

MS980Y/Z
PHYSICS

This module aims to equip the students with broad based physics knowledge and concepts which are relevant to their diploma courses in the Engineering, Science and Technology cluster. The topics covered include mechanics, thermal physics, waves, electricity and electromagnetism.

MS9810
SCIENCE FOR EVERYDAY LIVING

This module aims to provide the student with an appreciation of how Science is relevant in their daily life. The knowledge and practical skills that student learn in science can be applied in other areas as well such as multi-disciplinary projects. The topics covered are measurements, kinematics, dynamics, temperature and heat, sound and light, waves, electricity and magnetism.

SC5008
INTRODUCTION TO DRAMA AND PERFORMANCE
Introduces students to foundational performance skills and teaches them the basics of acting and directing stage performances through scripts and improvisations. Students will experience being part of a theatre ensemble either as an actor and/or a director.

SC5015
UNDERSTANDING RESEARCH AND ETHICS
Introduces students to the concept of ethics and research. Students will examine the ethical practices in applied drama work and in psychological research. They will learn the basic theories and practices of different forms of research.

SC5017
DRAMA-IN-EDUCATION
Can drama exist in the Singapore classroom? In this module, students learn how to incorporate drama into teaching to make learning come alive in the classroom by creating lesson plans for pupils of different ages and for different subjects.

SC5018
SOCIAL PSYCHOLOGY
Provides students with an overview of theories, methods and ethical concerns related to social contexts of an individual's behaviour. Students will be able to apply social psychology theories and concepts to interpret and explain individual human behaviour across social situations.

SC5023
INDUSTRY IMMERSION
Exposes students to the applied drama work done in authentic contexts, and/ or how psychology is applied in authentic contexts.

SC5024
THEATRE-IN-EDUCATION
Theatre-in-Education is more than just putting up plays at assemblies. Who decides on the content? Do plays have to be performed in the school hall? What happens after the play? From planning to execution, students will learn how to use performance as a platform to teach. They will also learn to create pre- or post-performance materials to help their participants learn.

SC5028
CULTURAL DIVERSITY
Students will learn about the diversity of races, cultures and religions in Singapore and understand the importance of the cross-cultural differences in the society. They will gain an understanding of how basic psychological processes may vary across cultures. Students will explore the influence of cultural traditions and customs in shaping social behaviour in Singapore.

SC5029
PROCESS DRAMA
Introduces students to the principles of Process Drama, a method of teaching where the teacher and student are working in and out of role. Students will develop skills in planning, implementing and evaluating process drama lessons for participants of specific age groups and learning needs. They will do so through practical sessions and projects.

SC5030
COMMUNITY PSYCHOLOGY
Students will explore physical, social and mental health issues within communities of individuals. The field of community psychology thus focuses on the quality of life of individuals, communities, and society. Its aim is to enhance quality of life through collaborative research, education and intervention. The module will allow students opportunities to explore a range of theoretical and practical perspectives.

SC5031
PSYCHOLOGY-IN-EDUCATION
Students will explore effective learning for learners in different contexts. Students will examine 'who' is taught and 'how' something is taught. It also highlights the interactive nature of 'what' is taught and 'why' it is taught as well as the importance of assessment. The content of this module will incorporate aspects of educational theories focusing on cognitive, psychosocial, socio-cultural and personality factors of learning.

SC5032
GRADUATION PROJECT
Focuses on researching, conceptualising, planning and facilitating an Applied Drama programme for a target audience. Students will get the chance to research, devise and facilitate a relevant programme for different communities to educate, communicate and intervene.

SC5034
FORUM THEATRE
Introduces students to the form of Forum Theatre as a method of theatre for intervention. They will learn how to use Forum Theatre as a responsible tool to facilitate thought and action. Students will create and perform their own original Forum Theatre play.

SC5035
METHODS OF INQUIRY
Introduces students to the basic concepts of quantitative and qualitative research methods and report writing. Students will be equipped with basic skills of data collection using techniques such as observations, questionnaires, interviews and experiments. Students will design and conduct simple research projects, analyse data and write up their findings according to a formal report format.

SC5036
CHILDREN ELECTIVE - STORY DRAMA & DEVELOPMENTAL ISSUES IN CHILDHOOD
This module will be co-taught by an applied drama lecturer and a psychology lecturer. Students will learn the principles and practices of Story Drama where the elements of drama are used to explore written literature (for example, storybooks, poems and folktales). Students will also identify and debate important local and global developmental trends and issues in childhood. Students will design a story drama workshop for children and take into consideration how children progress in the areas of cognition, language and socio-emotional development.

SC5037
YOUTH ELECTIVE - PARTICIPATORY VIDEO & ADOLESCENT PSYCHOLOGY
This module will be co-taught by an applied drama lecturer and a psychology lecturer. Students will learn the principles and practices of Participatory Video, where video-making is used as a tool to help communities explore issues, voice concerns or tell stories. Students will also examine issues related to adolescence like maturity in the body, sexual activities, teenage pregnancy and drug and alcohol use. Students will produce their own short video that addresses an issue that concerns adolescents, considering the cognitive and socio-emotional issues pertaining to adolescents.

SC5038
ELDERLY ELECTIVE - REMINISCENCE THEATRE & PSYCHOLOGICAL PERSPECTIVES IN AGEING

This module will be co-taught by an applied drama lecturer and a psychology lecturer. Students will learn the principles and practices of Reminiscence Theatre, where memories (often from the elderly) form the basis of performances. Students will also study the physical, social and emotional effects of ageing and the impact on mind-sets and behaviour in older adults as well as those around them. Students will develop a better understanding of the perspectives of older adults to effectively create a piece of Reminiscence Theatre.

SC5041
DRAMA CONVENTIONS

Students will be taught different drama techniques that are commonly used in Applied Drama. Practical sessions on the integration of these techniques within specific Applied Drama forms will be held in this module.

IB1002
INTERNSHIP

Provides students with opportunities to gain professional experience working with social service organisations, education-related companies and other community development agencies. This is a 17 week internship programme and students will get a chance to put their applied drama skills and/or psychology knowledge to good use.

SC5056
GRANTS, PROPOSALS AND EVALUATION

Introduces students to non-profit organisations in the arts and community services sectors. Students will be introduced to funding and grants available for projects that serve these sectors. Students will be required to put together a proposal applying for funding/grant for a hypothetical applied drama project.

SC506Y/Z
INTRODUCTION TO APPLIED DRAMA

Introduces students to the forms, methodologies and uses of Applied Drama. Students will learn about the history of such practices and their development both abroad and locally. Students will analyse and critique the practices of an applied drama practitioner / theatre company.

SC5061
DEVISED DRAMA

In Devised Drama, students get to create a play from scratch, direct the performance and be the actor as well. This module not only equips students with a theoretical and practical knowledge of dramatic forms and styles, it also teaches them the skills in performance-making.

SC5062
INTRODUCTION TO PSYCHOLOGY

People are drawn to psychology because they want to learn about the human mind and behaviour. The goals of psychology include describing and explaining why people think, predicting the way they do. At the end of this module, students will have an understanding of the major areas of psychology and gain insight into how knowledge of psychology can be useful in everyday life.

SC536Y/Z
LIFESPAN PSYCHOLOGY

Introduces students to a view of human development that examines the phases of life from birth to death. Students will be able to describe the physical, cognitive and socio-emotional aspects of human development - as a child, adolescent, adult and an elderly individual.

SC7251
HISTORY OF FILM

This module examines the history of film. It aims to give students a broad understanding of the social, political, economic and technological influences affecting film and the film industry. It also explores the relevance of these factors to the Singaporean context.

SC7252
SCRIPTWRITING FOR FILM

Introduces screenwriting as a distinctive media platform that requires a different set of skills and techniques, in terms of storytelling, scriptwriting format and the business of movie-making.

SC7253
DIRECTING FOR FILM

Highlights the role of the director in the filmmaking process. Students will learn the finer points of directing in terms of interpreting a script, storyboarding, casting, directing actors, camera shots, camera movements, blocking a scene and cinematography.

SC7254
PROJECT

Aims to give students a hands-on experience of the film production process. It develops in students the necessary critical and independent learning abilities through the conceptualisation, scripting, casting, directing, filming and editing of a short film.

SC770Y/Z
INTEGRATED MARKETING COMMUNICATION IN ACTION

Introduces students to the world of Integrated Marketing Communication through activity-based learning, field trips, guest lectures and case studies. It also introduces them to the careers that lie ahead and gives them the opportunity to interact with industry professionals.

SC771Y/Z
PROFESSIONAL COMMUNICATION

Focuses on communication in the workplace, with special emphasis on the marketing communication industry. Students will have hands-on practice with different forms of writing, from professional writing including memos and reports, media writing, such as writing for the print media, for broadcast and for promotional purposes. Students will also learn how to make good presentations and pitches, and how to perform well at an interview.

SC772Y/Z
VISUAL COMMUNICATION

Aims to provide students with practical design skills for different media applications with emphasis on clarity of communication and the importance of consistent visual branding. Students will also learn to create, refine, implement and present their concepts.

SC773Y/Z
VIDEO PRODUCTION AND DIGITAL POST

Introduces students to the theory and practice of video production and digital post production techniques for communication purposes. They will be able to perform the different tasks in the video production process, learn to create a story and pitch the concept. They will learn to produce and edit their videos in digital format.

SC774Y/Z
HUMAN MIND AND BEHAVIOUR

Offers an introduction to psychology as a discipline that explores different approaches to the scientific study of human behaviour. Students will be able to evaluate different perspectives on human behaviour. They will demonstrate an understanding of the major areas of psychology, namely the biological, cognitive, developmental, social and abnormal. In addition, they will gain an insight into how the knowledge of psychology can be useful in everyday life.

SC7744
INTRODUCTION TO BUSINESS

Aims to equip students with basic business concepts and practices such as marketing. Students will have an understanding of the business environment they will be operating in.

SC7745
SOCIAL PSYCHOLOGY
Aims to provide students with an overview of theories, methods and ethical concerns related to social contexts of an individual's behaviour. Students will be able to describe and discuss social phenomena of social perception, social influence, and social interaction. In addition, students will be able to apply social psychology theories and concepts to interpret and explain individual human behaviour across social situations.

SC7746
MASS MEDIA RESEARCH
Examines the role of research in the formulation of communication strategies and programmes. Students learn the different types of research methodologies as well as the fundamental processes involved in conducting research in the context of communication and mass media. It teaches students on how to use primary and secondary research methods, select sampling techniques, develop questionnaires as well as analyse data and present the research findings.

SC7747
PUBLIC RELATIONS
Introduces students to how relationship-building in the PR profession extends to Integrated Marketing Communication. Students learn and understand the importance of building and managing relationships with the various publics such as government, investors, employees and customers. Students will plan, manage and evaluate PR programmes as part of the Integrated Marketing Communication process.

SC7748
ADVERTISING
Introduces students to the knowledge and skills required for two key areas in the advertising profession: account management and advertising campaigns. Students are given an overview of the advertising industry and are taught client servicing as well as account management skills. Students also learn to produce and manage successful advertising campaigns as part of Integrated Marketing Communication, in order to build and manage brands.

SC7749
CONSUMER PSYCHOLOGY
Students will analyse consumer behaviour from a psychological perspective. They will be given an opportunity to explore habits and preferences of various consumer groups. The role of psychological processes in influencing one's reaction to consumer goods and services as well as the implications for advertising, marketing research and public opinion polling will also be addressed.

SC775Y/Z
STUDENT INTEGRATED MARKETING COMMUNICATION AGENCY
In the Student IMC Agency, students take on the role of IMC practitioners. They will work on a real-life project and will be guided in the process of IMC strategy development, from research and situational analysis to the implementation and evaluation of an IMC campaign. This module lays the foundation for students to understand and apply Design Thinking to the IMC challenge in order to develop solutions enriched with deep user insights and strong concept visualisation. Students will also be able to build a portfolio of their works.

SC7750
RADIO AND TV PRODUCTION AND MANAGEMENT
Introduces students to advanced production and recording techniques for television and radio, including TV studio recording and multi-track audio recording. Students will also be introduced to the basic concepts for television and radio programming, promotions and broadcast operations.

SC7751
NEWS AND FEATURE WRITING
Trains students to write news and feature articles for print, broadcast and online media. Students will learn the principles of good writing, information gathering and interview techniques.

SC7752
SOCIAL MEDIA
Provides students with a strategic overview of social media and how it can be used effectively in Integrated Marketing Communication. It introduces students to cutting-edge social media platforms. Students will discover how social media can be used to spread awareness, generate buzz and shape perceptions of both individuals and brands. Important skills such as search engine marketing, social media optimisation, tagging, linking, monitoring online conversations and traffic building will also be highlighted.

SC7753
MEDIA PSYCHOLOGY
Allows students to gain an understanding of how people perceive, interpret, use, and respond to a media-rich world, so as to identify potential benefits and problems and promote the development of positive media. The focus of this module will be on the impact of media on society. Issues covered will include conflict in media, media effects on self and society, communication and cross-cultural issues.

SC7754
FINAL YEAR PROJECT
Allows students to integrate and apply what they have learnt by conceptualising, developing and executing an Integrated Marketing Communication campaign.

SC7755
CENTRE FOR SOCIAL MEDIA
Provides students with hands-on experience in leading the Centre for Social Media. Students will have opportunities to develop strategies for building the Centre's online presence, conduct and publish original research related to youth and social media, and organise events related to the Centre. Students will be exposed to the latest social media trends and learn to write compelling content for various social media channels.

SC7756
SPACEMEDIA
This practicum provides an opportunity for students to further explore and apply their skills in content development, production, post-production, on-camera presentation and visual design to create a series of video podcasts (vodcasts) that highlight news, issues and trends relevant to Singapore youths.

SC7757
WRITING LAB
An advanced writing practicum, students will gain hands-on practice writing for various platforms in the form of real projects. They will write articles for online media, magazines, newsletters or brochures.

SC7758
AGENCY START-UP
Provides the platform for entrepreneurial students to start their own communication agencies, source for clients, pitch for projects and execute campaigns. The Agency Start-up will create a challenging environment for students to hone their skills as Integrated Marketing Communication practitioners while developing a portfolio of client projects.

SC7760
INTERNSHIP
Allows students to gain professional experience through attachments doing media/communication-related work in organisations such as Integrated Marketing Communication agencies, PR firms, advertising agencies, media companies, or corporations or government agencies with in-house PR/corporate communication departments.

SC7762
MEDIA LAW AND ETHICS
Teaches the basic concepts of media law and ethics applicable to the media and communication industry. Students will have an increased awareness and understanding in areas including the Singapore legal system; freedom of expression; defamation law; laws and policies affecting print, broadcast and online media; intellectual property law; and ethical considerations and issues.

SC8101
WRITING ACROSS MEDIA PLATFORMS
Introduces students to the various platforms in the media world and how they have evolved to dominate the present way of communication. Students will be able to recognise the changing identity, preferences and habits of the consumer of the different media platforms. They will learn to craft stories and content for each medium and platform. The module will also take the student through the processes of conceptualising, crafting and developing an idea into media content that can cross different platforms, for the evolving media consumer.

SC8102
DECONSTRUCTING TELEVISION
Provides students with a brief history of television and introduces them to the early television genres of drama, comedy, game-shows and reality TV. Students will deconstruct popular genres to appreciate the origins and how they have evolved into their present-day adaptations. Students will also explore how television networks use the latest technology to reach local and global audiences. This will enable students to create an original concept for a television programme.

SC8103
STORY CLASSICS: HEROES, MYTHS AND LEGENDS
Introduces students to the structure of the Hero's Journey by exploring classic fairy tales, myths and legends from around the world, contemporary films and fictional works. Students will gain a deeper understanding of the elements that are key in creating and telling good stories. They will also discover how these elements can be adapted to reflect the desires and preoccupations of present society.

SC8104
CREATIVE STORY MAKING
Introduces students to the creative writing process. It challenges students to analyse how stories have influenced them and the role stories play in understanding life. Students will discuss the history of storytelling and the meaning behind well-known fairy-tales. They will be taken through the entire journey of creating a story: from ideation to character development, plot, story structure and editing. Students will be exposed to writing for different audiences and genres. They will learn how to tell a story effectively as well as give critique constructively. They will be encouraged to discover their 'writer's voice' and apply the concepts they have learnt to write stories that reflect their unique voice and connect emotionally with the reader.

SC8105
STORYTELLING I: VISUAL COMMUNICATION
Introduces students to the fundamentals of story telling through visual communication. Students will investigate the techniques to communicate visual and dramatic elements within a script, without the use of dialogue. They will also learn the basic principles of information design, visual design, layout and colour, as well as how picture composition, camera movements and cinematography are crucial for good storytelling.

SC8106
STORYTELLING II: CONCEPTUALISATION AND STRUCTURE
Introduces conceptualisation and structure as crucial elements of good storytelling. Students will learn to create original concepts for a scripted series for TV or the internet, and how to use plots and subplots to engage their audience further and transform their fictional characters into multi-dimensional ones that resonate with the audience. Students will also learn about the use of traditional and interactive narrative structures to create a multi plot story for an episode of a TV or web series.

SC8107
SCRIPTWRITING FOR TELEVISION I: ENTERTAINMENT PROGRAMMES
Introduces students to an understanding of key entertainment genres in the television industry. It exposes students to the processes behind the evolution of a show from idea to broadcast. Students will learn how to conceptualise a programme that meets the needs of different television channels by pitching, crafting and developing television scripts for game-shows, children's programmes, infotainment and talk-shows.

SC8108
VIDEO PRODUCTION PRINCIPLES AND PRACTICES
Introduces students to the entire digital video production process, from translating a script to the final product. Students will learn practical aspects of single camera techniques, basic lighting, audio recording, camera directing and video editing. This module also trains students in the entire production process from the breaking down of a script to production and post. Students will produce, film and edit their own short video clip.

SC8109
COMMUNICATION SKILLS FOR MEDIA MAKERS
Introduces students to the oral and written communication skills needed by those involved in creating content for the media industry. Students will analyse networks and their branding and recognise the impact of sponsorship on content creation in the industry. They will learn the elements of an effective proposal and the importance of networking in the media world. They will also learn to handle intense question and answer sessions from media networks and media makers. In addition, students will be trained to sell their ideas by making effective pitches and presentations and how to market themselves and build connections in the industry.

SC8110
WORLD ISSUES AND THE MEDIA MAKER
Exposes students to the role of the media maker in shaping public views and opinions. Students will explore how the media maker is influenced by history, ideology and current affairs as a source of inspiration in producing media products such as articles, television programmes and films. Students will also reflect on the influential role of philosophers in key world events, leading to current media products.

SC8111
RESEARCH AND INTERVIEW TECHNIQUES
Stresses the importance of both primary and secondary research before an interview can be conducted. Students will learn the different techniques in carrying out an interview for various purposes and platforms. Through hands-on and experiential learning, they will also learn to organise, structure, focus and apply story and narrative to primary and secondary research. Final products include a written feature story and a video report.

SC8116
JOURNALISM I: NEWS WRITING FOR THE GLOBAL AUDIENCE
Leads students to explore the importance of news in a globalised world and its impact on society, culture and politics. Students will be introduced to the basic elements and stages of news writing and be trained in news writing for print, television and the web. News research, investigation, accuracy and strong

editorial skills will also be emphasised in this era of information overload. Students will write reports, scoops and columns.

SC8118
JOURNALISM II: TOTAL JOURNALISM

Prepares students for the demands faced by journalists today. They will learn to write a good story for print and broadcast news, be proactively involved in the news sourcing, gathering and production. Students will be trained to deal with diverse situations and persons, write headlines, create layout pages and caption pictures. Students will complete a news project from conceptualisation to final product, and in the process, develop their aptitude for news. Students will also be trained to recognise and develop different television formats related to journalism.

SC8120
WEB PUBLISHING AND DESIGN

Aims to equip students with the basic principles in web publishing as well as Design Thinking techniques. Students will explore deep understanding of the user, find creative resolution to tensions, develop collaborative prototyping and modify ideas for web solutions. Students will experiment with web authoring software, digital imaging, video compression, layout and design principles for web publications. They will also manage, plan and prepare electronic publications.

SC8124
FILMMAKING

Introduces screenwriting as a distinctive media platform that requires a different set of skills and techniques when interpreting a script. Students will learn about storytelling, scriptwriting, storyboarding, casting, directing and producing of a short film. This includes the different directorial styles of successful film directors so that they can apply the various techniques in making a short film. Students will also explore the business of movie-making.

SC8126
INTERNSHIP

Students will go on a 6-month internship with media production houses, media networks or media-related companies after Year 3, Semester 1. The internship is designed to let the students apply what they have learnt and use it in the real media industry. It also provides students with the opportunity to join the media industry immediately or boost their portfolio when applying for scholarships and a place in university.

SC8127
TELEVISION AND ONLINE JOURNALISM

Aims to hone the skills of journalism students in the fast-paced field of television and online reporting. Students will learn how to craft news crawlers, write to pictures, use sound and visuals, as well as make full use of online platforms for broadcast reporting. Students will develop scripts for soft and hard news, piece to camera and simulate breaking news situations.

SC8129
SCRIPTWRITING FOR TELEVISION II: DRAMA AND COMEDY

This module will deconstruct successful television dramas and comedies: what hooks an audience to follow the show week after week and what makes the audience laugh. Students will apply what they learn to write scripts and present them in a professional format. They will practice techniques on how to 'break' a story and develop a script from idea to final draft. Students will also learn how to construct character-specific and plot-driven dialogue. They will apply the rewriting process to rework outlines, nail the essence of their characters, tighten scenes, punch up dialogue and add polish to their final draft.

SC8130
VIDEO PRODUCTION FOR NARRATIVES 1: DRAMA AND COMEDY (VPN 1)

This module is designed to enable students to transform their written scripts into full-fledged production of a comedy or drama. Students will have to pitch for their work to be produced and only the winning pitches and scripts will be produced by the teams. This module challenges students to apply what they have learnt and further refines their scriptwriting, producing, directing, filming and production management skills to produce a drama and comedy.

SC8131
VIDEO PRODUCTION FOR NARRATIVES II (DOCUMENTARY)

Enable students to transform their documentary scripts into full-fledged video productions. Students will source, pitch, film and edit their own story. This module challenges students to apply what they have learnt and further refine their scriptwriting, producing and production skills in the context of producing a documentary.

SC8132
TRANSMEDIA STORYTELLING

This module shows students how narratives are relayed through creative and simultaneous use of multiple media platforms. Students will analyse the strengths and weaknesses of various mediums such as television, web, video games, social media and mobile apps. They will learn how to tell compelling stories that give the audience a more complete, rewarding, and immersive experience.

SC8133
MEDIA ENTREPRENEURSHIP

Gives students a broad overview of the media as a business, including the value chain from creation and production to distribution. Students will learn to recognise changing media market demands, appreciate their place as writers and creators, take ownership of their work and discover how to network, manage and distribute their media content to production houses, television networks and related businesses. Students will also be challenged to find creative and innovative ways to brand their creations, look for sponsors, pitch and market their ideas and content, and adopt a proactive approach to media buyers and consumers.

SC8134
ON-LOCATION PRODUCTION

This module trains students to produce a five-minute documentary in an overseas location. Students will travel outside Singapore and learn how to find a compelling story in an unfamiliar environment within a fixed duration. On location, students have three days to conduct location research, find a story, interview and film their documentary. Students will also be guided prior the trip to prepare for the filming trip by conducting research, preparing a budget and scheduling a production schedule.

SC8135
CREATIVE WRITING PROJECT

This module requires students to research, propose, conceptualise, write and film a trailer of an original concept for television or the web. Finally, they will pitch their concept to industry content makers to showcase their strengths as media content writers and creators. The creative writing project will assess the students' learning in the areas of conceptualisation, writing, storytelling, pitching, video production, web design and media entrepreneurship skills.

SC8138
INTRODUCTION TO DOCUMENTARY

This module will deconstruct well-known documentaries that have changed the world and examine the elements that made the documentary one of the most significant genres of film and television. Students will explore the importance of objectivity, ethics and morality in their roles as social activists, and research and script a documentary on a pertinent issue.

SC8139 STORYTELLING III: CHARACTER AND PLOT DEVELOPMENT

Explores the importance of understanding the media audience and the appeal of myths, heroes, and anti-heroes as well as universal and specific themes. This will help create identifiable, lovable characters. Students will use character development, motivation and an understanding of the rhythm of language to create dialogue for their characters. Students will also learn various plot development techniques to enhance their storytelling.

SD0002 FOUNDATION DESIGN STUDIO

This module introduces students to basic skills in design and creative processes. Ideation will be taught through a series of short projects that will help them to understand and explore various design processes and methods. This module will help students to un-learn the preconceptions that they may have accumulated. It teaches students to question normality, standard practices and to think creatively and critically.

SD0003 BASIC DRAWING CLASS

This module introduces sketching as the basic visualisation tool for designers. Students are exposed to the fundamentals of drawing based on observation and sighting techniques using traditional graphite medium. The expressive component of the drawing process on forms, textured, proportion, spatial relationship, perspective, tonal values and composition are explored through focused exercises on still life, figure and environmental drawings.

SD0005 EXPERIENCE DESIGN METHODS

The module aims to instil fundamental user research methods essential for design students and will equip them with basic techniques in observation, analysis and exploration of ideas. The module is delivered through a series of exercises designed to equip students with skills in observational and analytical methods to allow students to understand the users as social beings interacting with spaces, objects and time. Students will also be introduced to basic facilitation skills to engage their audience in design activities.

SD0006 LOGIC DESIGN

This module aims to equip students with foundational knowledge to tackle elementary computational problems. The intention is to train students to design solutions to solve problems using a computer program, thus creating opportunities to experience key elements of computational thinking which encompass:

- decomposition: breaking down data, processes or problems into smaller, manageable parts.
- pattern recognition: observing and generalising patterns, trends, and regularities in data and processes into rules or insights.
- abstraction: identifying the general principles that generate these patterns.
- algorithm design: developing step-by-step instructions for solving problems/tasks.

SD0007 COURSE SPECIFIC SKILLS

This module aims to introduce students to the fundamentals of the design, hardware, software and technical skills necessary for their respective diplomas. Students will be expected to understand the basics of each area as a foundation for further development in their respective fields.

SD0008 GRAPHIC VISUAL COMMUNICATION

This module introduces students to various means of digital media. Students will be introduced to the basic fundamentals of digital photography, vector graphics creation and typography. Photography skills will be taught to equip students with the vocabulary of the medium to convert photographs with basic digital retouching skills to transform images into meaningful storytelling images. Digital Vector Illustration with practical sessions in typography and layout design are also introduced. Students will understand the basics of page hierarchy and effective visual flow through layout & composition design. Students will have a portfolio of typographic, photographic, vector design work and projects demonstrating the application of the module topics.

SD006Z DESIGN THEORY AND RESEARCH I

This module aims to inculcate basic skills of critical analysis, reading, writing and research for first year design students. Using a set of design lenses as critical and theoretical building blocks, students will learn to apply theoretical ideas to augment their conceptual ideation, to build design arguments and evaluate design propositions through reflections, presentations and writing, and understand the foundations of design conceptualisation and thinking.

SD1101 INTERIOR DESIGN STUDIO I

Students will be introduced to basic design terminology, skillsets and conceptualisation methodologies. Students will explore the fundamental relation between the body and space and its direct relation to the scale and size of our constructed environment. Students will also be equipped with basic spatial planning, design development, documentation and communication techniques which are integral to interior design. The module also emphasises consistent craft making and iteration of design ideas with the aim of developing conscientious design sensitivity in each of the students.

SD1103 INTERIOR DESIGN COMMUNICATION I

The module emphasises on students acquiring foundational level of manual drawing techniques and using computer aided software to produce orthographic drawings. Introduction to techniques in graphic-based software will also be taught to students to enable them to refine visual content in their presentation. Verbal presentation techniques are also introduced and closely integrated to their studio reviews and critiques.

SD112Z INTERIOR DESIGN STUDIO II

The module investigates the issues of spatial experiences, in response to a specific commercial context, such as retail and mixed-use spaces. Students are required to understand the 'Client' brief and do a contextual mapping and analysis to understand the existing physical constraints (including the building structures as well as socio-cultural and economic patterns). In addition, students also study concepts of branding and marketing, their strategies and understand their effects on design.

SD113Z INTERIOR DESIGN COMMUNICATION II

Develops advanced understanding of 3D interior renderings, walkthroughs and animations to present interior design projects effectively. Students are also exposed to complex digital presentation techniques and develop skills in visual composition and graphic design communication. Students will use these skills for presentation and documentation of their design projects.

SD114Z INTERIOR DESIGN STUDIO III

The module examines the issues and challenges of interior design within the context of civic and cultural environments such as work- spheres, restaurants, library, galleries, etc. This includes urban spaces especially as a response to the demands of an increasingly global and technologically advanced world. Students demonstrate their accumulated knowledge and skills in their final-year projects from conceptualisation to documentation for construction.

SD1102 MATERIALS AND TECHNOLOGY I

This module equips students to take on an experimental and investigative approach to study materials, as well as understand the fundamentals of frame structure and construction. In conjunction with their design project, students will explore an array of materials and apply the craft of designing and detailing spatial elements, finishes and fixtures for dwelling spaces.

SD116Z MATERIALS AND TECHNOLOGY II

The module focuses on processed/synthetic materials as finishes for interior surfaces (floor, wall, ceiling and fixtures) as well as furniture and furnishings. Students explore and discover the effect of design poetics of materials in the conditioning of spaces. They also learn construction and detailing techniques towards enhancing consumer experiences in residential.

SD117Z MATERIALS AND TECHNOLOGY III

This module further develops the knowledge and skills of using materials and detailing techniques in interior design to respond to the complexities of new architectural designs and technologies. At the same time, students are also exposed to the importance of environment management and sustainability and they learn to refine their design and detailing skills. The advancement in lighting technology is studied and students learn their important effects on interior design. The relevant building codes and standards are also introduced when students are applying their knowledge in their design project.

SD118Z INTERIOR DESIGN COMMUNICATION III

The module develops in students a working understanding of Building Information Modeling (BIM) software which is used by the building industry as well as advanced modelling and animation software. Students are also equipped with a fundamental working knowledge of advanced 3D software used for generating complex spatial manifestations in experimental design and presentation.

SD1201 INTERIOR DESIGN PRACTICE – FUNDAMENTALS

This module is an introduction to a practice-oriented interior design training that develops students with the relevant discipline, practical skills and knowledge to apply to working life as a designer. Pre-contract administration procedures are introduced to students for the understanding of the planning and management of projects and expectations in an interior design office. Students are exposed to Codes of practices and professional practices in the interior design industry. A portion of the module also focuses on the students' own personal development as a designer.

SD1301 INTERIOR DESIGN PRACTICE – ADVANCED

This module provides a practice-oriented interior design training that develops students with the relevant discipline, practical skills and knowledge to apply into their working life as a designer. Pre-contract administration procedures are introduced to students for the understanding of the planning and management of projects and expectations in an interior design office. Students are exposed to business, management and productivity concepts and applications with emphasis on the operations and functions of an interior design practice.

A portion of the module also focuses on the students' own personal development as a designer.

SD2102 VISUAL DESIGN STUDIO

This module offers a focused study of graphic design concepts and the practice of graphic design communications. Building upon their foundational understanding of graphic design, students will hone their sensitivity and creativity in typography and colour, to formulate emotionally resonant visual solutions for effective communication. Students will learn the framework and strategies of infographic design, and be equipped with advanced techniques in digital illustration software. By the end of the module, students would have internalised the creative processes involved in design, and would fully incorporate their knowledge and skills gained in this module through a series of integrated design projects.

SD2104 2D MOTION GRAPHICS

This module aims to deliver a practical approach to designing moving images for graphic communication solutions. Students will learn to create motion graphics as a medium for design expression. Through studio sessions, students are encouraged to explore key concepts and processes, such as ideation, storyboarding, graphical illustration, animation, audio insertion and special effects for motion graphics projects. These skill sets are intended for use in the creation of music videos, title treatments, and other graphics for broadcast, film, web and advertising.

SD2106 DIGITAL PHOTOGRAPHY AND IMAGING

This module exposes students to the theory and practice of digital photography within the framework of an integrative digital workflow, including the finer points of digital image enhancement. Students will be taught product and portrait photography and learn the essentials of controlling and balancing artificial lights with natural lights to achieve impactful aesthetics for photography. Students will focus on studio and outdoor digital photography, and be equipped with the fundamentals of preparing digital images and advanced techniques of image manipulation. By the end of the module, students would have created a portfolio of photographic fine prints for commercial applications.

SD2107 DIGITAL ARTS STUDIO

This module will introduce students to key techniques, industry standard tools, and process to apply digital imaging into graphic and advertising outcomes. Students will be exposed to in-depth understanding and industry standard software applications for training. Integrating creativity and conceptualisation skills, students will be trained to convert raw images into outcomes used in the thriving digital media industry.

SD220Z BRAND DESIGN STUDIO

This module provides a key overview of applied design within real world commercial context, focusing on brand experience in an integrated communications environment. Students will learn key concepts and components of marketing and branding through the formulation of marketing plans and executing creatives in the areas of Corporate Identity, Packaging Design, Advertising Campaigns and Publication Design. Practical sessions on Desktop Publishing tools will equip students with the technical aspects of design visualisation. Pre-press skills and production knowledge will also be taught to ensure that students have a thorough understanding of the visual communications design ecosystem.

SD2205 PORTFOLIO DESIGN

This module equips students with the skills to design a portfolio package to aid them in their post-polytechnic placement in the industry, and the required skills to market themselves suitably to potential employers. Students will have their personal branding differentiated and articulated, and their works archived on a chosen platform creatively. They will also be trained to present themselves professionally at interview sessions, and identifying opportunities through industry networking.

SD2206 VIDEO FUNDAMENTALS

This module exposes student to the theory and practice of digital video production. Students will be taught video camera techniques, audio capture techniques, non-linear editing techniques in both video and audio and learn the essentials of controlling and balancing artificial lights with natural lights to achieve impactful aesthetics for videography. Students will focus on pre-production, production and post-production, and also be equipped with the fundamentals to prepare digital video in various formats for different platforms. By the end of the module, students will be expected to create a show reel of commercially viable work.

SD221Z WEB DESIGN

In this module, students will learn the basics of design, as well as front-end development for web. Students will begin with a practical understanding of information hierarchy and interface design, which escalates into the planning and production of multi-page web projects. The module focuses on web content management with the emphasis on user needs analysis.

SD230Z COMMUNICATION DESIGN STUDIO

After Visual Design Studio (Year 1) and Brand Design Studio (Year 2), the students then ladder up to Communication Design Studio in Year 3 to further refine their creative, conceptual and communication skills. Students will learn to address strategy and aesthetics in communications design, while experimenting with the possibilities and constraints of virtual, physical and mixed spaces. With an increasingly mixed-media landscape, the module covers different ways of engaging with the masses in a more interactive and personalised manner. Covering both traditional and digital media, students will also explore creating brand stories in alternative and new media using techniques from basic electronics to experimental photography. The module will culminate in the Final Year Project, where the next generation of visual communicators will be assessed on how they synthesize creativity, strategy and technique to create immersive brand narratives.

SD304Z GAMES DESIGN AND DEVELOPMENT STUDIO II

This module exposes students to 2D and 3D game projects where they will be applying the technical skills that they have acquired from other supporting modules in Year 1 and 2 to produce games in a team. There are opportunities for students to work on real life projects, which will bring workplace practices to the classroom to give a more authentic learning experience. Students will go through the production pipeline and learn how to use agile project management methods in managing the game projects. In these projects, they will acquire techniques on managing communication, conflict and stakeholder expectations through simulated experience and guidance from our tutors.

SD307Z GAMES DESIGN AND DEVELOPMENT STUDIO III

Students engage in a Final Year Project (FYP) to formulate a design proposal with the relevant research, derive game-play structure with narrative, design characters and environments, program the game, conduct play testing, and finally document the production process. This module will be a platform for students to demonstrate their technical capabilities in game making, using the intellectual tools and practical skills accumulated and developed in the course. In a simulated game studio environment, students will also demonstrate their ability to manage a project, as well as work and communicate in teams with diverse roles.

SD309Z GAME ART AND ANIMATION IV

Students will be required to apply all the prior knowledge to create high quality artwork for games. The module also supports their Final Year Project (FYP) from pre-production to final production stage. It also covers advanced topics of creating high end 3D models and cinematic animation for games. Furthermore, students will be familiarised with advance techniques of realistic lighting and rendering in order to represent their assets in a next-generation game engine environment.

SD310Z GAME DESIGN III

This module aims at furthering student learning in more innovatory aspects of game design. Students will learn how to design advanced mechanics and levels for different scales and genres of game like social, role-playing, virtual reality and augmented reality games. The business aspects of games will also be covered with topics on business planning, client negotiation, pitching strategies and monetisation. Gamification principles and techniques will be inculcated to explore solutions to education, healthcare and marketing activities. Students will also learn how to manage players' expectations and experience with Need Analysis performed using design thinking methods.

SD3102 GAMES DESIGN AND DEVELOPMENT STUDIO I

This module lays the foundation for the training and education of the game designer, as well as introduces the games design and development methods throughout the programme. Students are introduced to the basic skills of craft and the design process. Through a series of assignments, students are given opportunities to conceptualise game ideas, and develop prototypes for physical and digital games. Areas of design documentation, team roles, group dynamics, and conflict management are addressed to prepare students for group work.

SD3105 GAME PROGRAMMING I

This module aims to equip students with the knowledge and skills required to produce a digital 2D game prototype using commercially adopted game engine. Students will be introduced to game development terminology and basic programming fundamentals to aid them in creating a prototype or proof of concept, which is an important phase within a typical game production life cycle. Students will also be taught how to infuse design considerations into the development process as part of the training to be a proficient game designer cum programmer.

SD3106 GAME DESIGN I

This module will introduce students to the fundamentals of game design and development, starting with the typology and principles of games and its structures. Students learn the different categories of games and platforms available, review different games to develop their critical skills in the process, game structures, rules and play-testing. Students will also learn how to design basic game mechanics and levels for 2D games. Basic interactive design, including interface design for physical and 2D games are covered as well.

SD3107 GAME ART AND ANIMATION I

This module will let students learn to fundamentals of 2D assets creation and animation for digital games. Animation basics and 2D sprites creation will be covered to provide support for students' studio project. With the application of fundamentals in lighting, perspective, and concept design, this module allows students to use the combined knowledge to create the assets necessary for their 2D game projects with reference to a production pipeline.

SD311Z GAME PROGRAMMING IV

This module aims to equip students with knowledge for the implementation of advanced features commonly used in sophisticated game development. This includes algorithm patterns, coding strategies, AI programming, finite state machine, multi-player networking, advanced UI and animation control, etc. Students also get to explore trending and emerging technologies that enhance the user gaming experience. This includes virtual reality, augmented reality,

mixed reality and use of various sensory devices through hardware integration. This module is positioned to support students in their Final Year Project to design and develop engaging and innovative games for different interactive digital media platforms.

SD314Z GAME DESIGN II

This module covers how games create experiences beyond entertainment. Students learn the theories behind User Interface and User Experience to design games for different applications. Students will also learn about crafting a narrative for games and how to design unique mechanics and levels for 2D and 3D games on game consoles, personal computers and mobile devices.

SD3203 GAME ART AND ANIMATION II

Students will be introduced to the fundamentals of 3D art and animation. They will translate their 2D art fundamentals learnt in Year 1 and create various 3D models and textures for 3D spaces. They will also learn basic animation techniques for 3D game assets for digital games.

SD3204 GAME ART AND ANIMATION III

This is a specialisation module where students are taught how to create more complex levels of 3D models using hard-surface and organic modelling techniques including how to establish lighting and applying texture to a 3D model. The students will learn to create skeletal rigs that is used to set up 3D models for animation before designing, planning and creating animations for a 3D game project with game design considerations. This will also be supported by lessons that will further their knowledge in human anatomy and character, prop and environment design.

SD3205 GAME PROGRAMMING II

This module aims to equip students with knowledge to implement digital 3D game prototypes through fundamentals of problem solving and programming. These skills are taught through programming constructs as well as simple object-oriented concepts like objects and classes, inheritance, polymorphism, multi-dimensional arrays, statics, etc. It will allow students to plan, conceptualise, design, script and develop game levels using commercially adopted content creation tools and game engine. Besides using a native level construction editor to build 3D levels, interaction with different forms of input devices such as mouse, joystick, hand gestures, and so on will be covered as well.

SD3206 GAME PROGRAMMING III

This module further explores the principles behind an object-oriented approach to programming using commercially adopted game engines. Topics covered include modular coding, generics, event handling, data structures, memory management, code optimisation, debugging techniques and so on. This subject also provides a grounding on computer and mobile technologies, their architectures and components. This is to equip students with necessary programming skills and knowledge to design and develop optimised mobile games for handheld devices with gesture-based controls before embarking on their internship programme.

SD4101 EXPERIENCE DESIGN STUDIO I

This module aims to introduce experience design as a meta-concept or philosophy, that provides direction, vocabulary, and technique that can enable multiple disciplines to work together in a unified manner. Students will begin by learning to differentiate between designing objects and designing experiences. They will learn the principles that define or drive the orchestration of the organisations' products, behaviours, communications, and environments across multiple tasks/activities/contexts. The studio projects will be at an introductory level and will allow students to be conversant with designing on a range of scales for the human body, objects, spatial environments and services.

SD405Z EXPERIENCE DESIGN STUDIO II

In this module, students will be trained to be equipped with design skills and creative thinking capabilities. It aims to provide a breadth of projects and to sink students deeper into the design world. There will be predominantly four areas in design skill sets that can enhance and heighten their design awareness and sensitivity, namely Product Design & Making, Product Development and Detailing, User Experience Research and User Experience Design. Students will also learn Project Management, Framing insights and Translating insights into experience design solutions.

SD4305 PROFESSIONAL PRACTICE PROJECT

In Professional Practice, Students undertake a project with industry relevance or involvement as part of their future professional development. Students will learn to design from a real-world practice perspective to gain a deeper appreciation of real-world constraints. Individual contribution in common studio effort will be a key component of professional practice learning.

SD4306 EXPERIENCE DESIGN STUDIO III

In Experience Design Studio 1, students learnt about the design process and the notion of creating experiences. In Experience Design Studio 2, students reinforced their knowledge and praxis in observing and understanding the users through the use of different user research methods.
In this Experience Design Studio 3, the main priorities are the development of the individual portfolios and the deepening of their knowledge and praxis in Experience Design process from the framing of the experience design project and user research to designing and implementing experiences. Students are directed to understand and conceive design not just by focusing on problem solving, usability issues, market driven innovations or consumer trends methodologies. They will be challenged to balance open-ended & analytical processes, focusing on user experiences and sensorial expressions.

SD4104 VISUALISATION AND COMMUNICATION FUNDAMENTALS

The ability to visualise information/products/services and the interaction/experience that consumers have with them, and represent them for the purpose of communication, is an essential skill any experience designer should possess. The students will be trained in the following:

- Freehand drawing and sketching methods.
- 2D technical drawing for product, mechanical and spatial design applications.
- Computer-Aided Design and Drawing skills in 2D forms and representation.
- Studio-based object photography

SD413Z VISUALISATION AND COMMUNICATION FOR EXPERIENCE DESIGN

The Visualisation and Communication for Experience Design module will build upon Visualisation and Communication Fundamentals module to introduce experience design specific visualisation, and communication techniques to support documentation and narration. The students will be trained in the following:

- Photography and videography for product demonstration and storytelling
- Computer-Aided Visualisation and Presentation skills in a variety of multimedia mediums and formats (e.g. image, animation)

SD414Z RESEARCH METHODS FOR EXPERIENCE DESIGN

In this module, students will be looking into investigative, imaginative, analytical, explorative and experimental methods and techniques of thinking and doing design. This module will support Experience Design Studio 2 in facilitating the teaching of methods directly applicable to the studio module.

SD4107 RESEARCH METHODS FUNDAMENTALS

In this module, students will further develop Experience Design research method skills and go into specific exercises that further develop their ability in observation, analysis and explorative processes. This module will support Experience Design Studio 1 in facilitating the teaching of methods directly applicable to the studio module.

SD4105 INTERACTIONS AND SERVICE FUNDAMENTALS

This module introduces students to the fundamental approaches for designing meaningful interactions. Students will learn to understand interactions through the notion of navigating information and making choices, and will be taught to identify the needs of people when engaging with a product or service. To support this, students will be taught basics in interface design, information design and navigation design as it is applied to both digital and non-digital scenarios.

SD412Z INTERACTIONS AND SERVICE FOR EXPERIENCE DESIGN

This module introduces students to the framework for designing meaningful interactions between people and the products or services that they use. Students will learn to design products and services that are relevant to people's needs and expectations in both tangible and intangible aspects. To support this, students study methods from different design disciplines, such Interaction Design, User Interface Design and Service Design, and appropriate methods in ancillary domains such as aesthetics and psychology. The module will also explore various tools and techniques to prototype user experience and communicate user scenarios.

SD415Z MATERIALS & PROTOTYPING FOR EXPERIENCE DESIGN

This module aims to deepen the student's understanding of processes in prototyping and manufacturing and how materials are adopted in mass production. Students will acquire an understanding of prototyping processes, and 3D Computer Aided Design will be taught in this module to support these processes.

SD4106 MATERIALS & PROTOTYPING FUNDAMENTALS

This module equips students to take on an experimental and investigative approach to study materials, understand its accompanying qualities as well as its application in design. Students are encouraged to manipulate the assigned materials to bring about new design possibilities and realise the potential of a material. Through a multi-disciplinary design perspective, students will gain a broader understanding of the principles and application of materials in different design contexts.

SD601Z DESIGN THEORY AND RESEARCH II

This module aims to develop students' critical and analytical skills with various design lenses in the research and study of technological, social, political, historical, cultural and economical scenarios. This inquiry allows students to comprehend the influences and impact that these factors can have to catalyse design propositions.

SD602Z DESIGN THEORY AND RESEARCH III

This module aims to explore and challenge design methodologies, forms and practices. This allows the students to employ the theories in their final year project with the intention to expound their design propositions.

SD7201 RAPID PROTOTYPING (ELECTIVE)

This module equips students with a functional understanding of Rhino 3D 5.0 as a design platform. Using Architectural and Product Designers models, students will be introduced to digital modelling techniques, precision modelling and geometry manipulation from design to build.

SD7202 USER EXPERIENCE DESIGN (ELECTIVE)

This module equips students with fundamental knowledge of the User Experience (UX) Design Process. Students will immerse themselves in understanding the ecosystem and people, learn methods to uncover the motivations of the user, and design the basis of how users can relate to experiences, through the rethinking of the architecture and flow. The module is taught through a participative studio and will equip students with specific methods in the research and early prototyping of designing an enhanced user experience.

SD7203 VIRTUAL AND AUGMENTED REALITY(ELECTIVE)

This module exposes students to innovative and creative processes that lie behind Augmented Reality (AR) and Virtual Reality (VR) development. Through introducing the unique affordances and design opportunities inherent to these platforms, students will master techniques for integrating content and building interactive applications used for visualisation, simulation, communication and collaboration purposes. Potential trends and applications of these technologies used in the enhancement of user experience (UX) will also be explored.

SD7204 DIGITAL VISUAL STORYTELLING (ELECTIVE)

This module exposes students to the theory and practice of visual storytelling through videography. Students will be taught video camera techniques, audio capture techniques, non-linear editing techniques in both video and audio and learn the essentials of lighting to achieve impactful aesthetics for videography. Students will be equipped with the fundamentals of storytelling, videography and editing, to prepare digital content in various formats across different platforms.

ST0214 AUGMENTED REALITY & VIRTUAL REALITY DEVELOPMENT

Aims to foster an awareness and appreciation for the innovative and creative processes that lie behind successful Augmented Reality (AR) and Virtual Reality (VR) development. Students will learn about the different AR and VR platforms, the different requirement for each platform and how to optimise for each platform. Students will develop various AR and VR prototypes.

ST0218 DATA STRUCTURES & ALGORITHMS

Covers the OO concepts and data structures and algorithms. Students will learn to implement stacks, queues and linked lists and solve problems using these data structures.

ST0246 MOBILE GAME DEVELOPMENT

Provides students with knowledge and skills on developing games for next-generation smart phones. Students will learn to add graphics, audio and local storage facility for their applications. Upon successful completion, the students will have experience and knowledge in designing user-centric games utilising modern mobile technologies including touch screen and gesture user interfaces, camera, location-based services, compass, vibration and accelerometer. Students will also learn optimisation tips and tricks for stable and responsive mobile games. In addition, students will also learn how to package their mobile games for sale and distribution on an online market place.

ST0248
PROGRAMMING FOR DATA SCIENCE
Provides students with the fundamental skills to code applications to retrieve, clean and visualize data using Python programming language. Students learn key concepts such as how structured and unstructured data are, and how they can create and manipulate relational and NoSQL databases to explore data and to create visualizations that provides insights for business decisions.

ST0249
AI & MACHINE LEARNING
Provide students with fundamental concepts in Artificial Intelligence (AI) and Machine Learning. The module aims to provide students with hands-on experience in building applications that use machine learning and neural networks. The students will learn skills to build intelligent agents, such as Chatbots, and integrate cognitive service APIs to add intelligence into their applications.

ST0257
WEB APPLICATIONS DEVELOPMENT
Equips students with the knowledge of an integrated development environment (IDE) that supports .NET web applications development. Students will be able to create dynamic web applications with advance web elements, JavaScript, ASP.NET technologies.

ST0276
ETHICS AND LAW OF IT AND MEDIA
Provides students with an understanding of the ethical and moral aspects of Information Technology and media management, as well as the basic and general aspects of the law arising from the Information Technology and media industries. Upon the successful completion of this module, students will become aware of the ethical and moral issues faced by professionals in the Information Technology and media industries. They will also learn, understand and be able to apply general aspects of the law in Information Technology and the media to their work in future.

ST0277
DESIGN FOR USER INTERACTION
Equips students with the knowledge in designing interactive interfaces for various platforms, such as web and mobile, to provide pleasant user experience. They will be equipped with skills to create interactive prototype using prototyping tools.

ST0280
CLOUD AND SERVICE COMPUTING
Provides practical introduction to cloud computing architecture and service development. Topics cover from design to implementation of services consumed by normal web clients, AJAX clients, or other applications. Students will be taught the skills required to design, code and implement services based on cloud platform and web platform.

ST0281
MOBILE APPLICATIONS
Imparts general domain knowledge in the area of mobile networks and applications development. The architecture of the mobile network, the operating systems used in different mobile devices as well as the software tools used for mobile applications development will be taught. Students will also understand how deployment and bringing the application to market are done. On completion of the module, students will also be able to program, among others, user interfaces, persistence storage, 2D graphics and location-aware applications using Android as an example platform.

ST0291
ENTERPRISE APPLICATION DEVELOPMENT
Equips students with knowledge in enterprise web application development, with the use of J2EE (Java 2 Platform, Enterprise Edition). Students will be able to develop a web application that facilitates various means of online payment, implement Java server side programs that have database access and deploy a web server. Students would also be taught on good practices of secure coding.

ST0292
NETWORK MANAGEMENT AND ASSURANCE
Introduces students to the various tasks that are undertaken by the network specialists to provide a stable and optimised network infrastructure. Upon successful completion of this module, students should be able to setup and maintain networked systems, troubleshoot performance problems, monitor network availability and remedy policy violations and recommend basic network security policies.

ST0293
USER INTERFACE DESIGN
This module allows students to create interactive applications with graphical interface that will illuminate the interaction between users and its contents. Subjects like colour theories, screen typography, visual thinking processes, and interface design principles will be taught in this module.

ST0294
GEOSPATIAL VISUALISATION
Equips students with the capability to build engaging applications that incorporates location-aware data with the power of geospatial analysis. The module introduces the fundamental concepts of a Geospatial Information System (GIS) as well as the properties and structure of a GIS map. It will cover the use of GIS APIs to incorporate basemaps as well as working with queries to create GIS enabled web and mobile applications. At the end of the course, the student will be able to choose an application development environment that is suitable for a particular need as well as design an application for efficient querying and editing of IS data.

ST0297
INTRODUCTION TO GAME DEVELOPMENT
Fosters awareness and appreciation for the innovative and creative processes behind successful game development. Students will learn about complete game development cycles, ranging from conceptualisation to game prototyping. Students will be trained to develop compelling games using an authoring tool.

ST0298
INTERACTIVE COMPUTER GRAPHICS
Provides an introduction to programming interactive computer graphics, with an emphasis on game development using a 3D graphics API (Application Programming Interface). Students will learn how to perform 3D rendering fundamentals, such as lighting, texturing, blending and stenciling.

ST0299
GAME PROGRAMMING USING C++
Provides an introduction game physics using pointers, memory management, and Object-Oriented concepts such as inheritance and polymorphism. Provides a practical approach to the development of common game. The practical sessions focus on the linear transformation, collision detection and response of 2D game objects using the C++ programming language.

ST0313
ESSENTIAL LINUX SYSTEM ADMINISTRATION
Aims to provide students with the hands-on sessions on Linux operating systems. Students will be taught on the use of various Linux commands/system tools for user management, security administration, software installation, network administration and configuration of services. These topics are essential and prerequisite to learning the skills of an entry level Linux administrator or helpdesk technician in an enterprise environment.

ST0316
ADVANCED JAVA PROGRAMMING
Covers advanced Java programming and OO concepts and is a follow up to the Object-Oriented Programming module or Java Programming module offered in Year 1. Students will learn more advanced Java programming topics like threading, generics, the Java collections framework and new features present in J2SE.

ST0318
SOLUTIONS DEVELOPMENT PROJECT
Provides students an opportunity to integrate knowledge and technical skills they have acquired from the course and experience problem-solving, project management, communication and working as a team to develop IT applications. The project can be based on any IT application area, subject to the approval of the school, and can be implemented using any software and hardware platform available in the school.

ST0320
GAME DEVELOPMENT PORTFOLIO
Provides opportunities for students to work in teams on game projects of reasonable size and to build up their portfolio as well. Projects may be chosen from a spectrum of game types ranging from Internet games, mobile games, PC action games and online multi-player games.

ST0324
INTERNET OF THINGS
Provides a practical introduction to develop Internet of Things (IoT) applications. Students will learn what is IoT and its growing importance to support the emergence of autonomous systems. They are taught how to collect and process data from devices such as motion sensors or web cameras, and utilise the information to create useful applications for business or community.

ST1001
DATABASE MANAGEMENT SYSTEMS
Equips students with database knowledge including the characteristics of a relational model, functions of relational database management system (RDBMS), process of normalisation, entity-relationship modelling and Structure Query Language (SQL). Students will also be introduced to the concepts of Big Data and its impact to businesses.

ST1002
DIGITAL VISUAL DESIGN
Aims to train the students on the use of image processing and painting tools for web and interactive applications design. Students will learn the techniques in digital imaging using Adobe Photoshop. Basic design principles like colour theory, typography layout and design elements will be covered in this module. Emphasis is positioned on structuring the students' concept and helping them to develop their visual thinking. Basic photography skills will also be taught to help students to capture still images to use in their design.

ST1004
INFOCOMM SECURITY
Provides students with an understanding of infocomm security concepts and issues. Students will be able to identify the risks, threats and the vulnerabilities of the Internet and learn how to defend against security breaches by identifying effective counter measures to be taken against identified vulnerabilities. Students will also learn about ethical and responsibility issues through case studies of security breaches.

ST1007
SOCIAL MEDIA MARKETING
Equips students with the knowledge and skills to use social media effectively and ethically in marketing. Students will learn the key features of the popular social media platforms that digital marketing agencies and businesses use to reach out to their consumers. They are also taught how to plan and design social media marketing strategies and campaigns that can be integrated with traditional marketing methods.

ST1008
WEB CLIENT DEVELOPMENT
Teaches techniques and skills required for front-end web development. Students will learn to use latest front-end web technologies to build interactive and responsive sites that can support various platforms.

ST1010
NETWORK FUNDAMENTALS
Equips students with the fundamental concepts and skills in data networking, both wired and wireless. Students will learn basic network devices, functions, standards, and protocols and will acquire basic networking skills like designing and setting up a local area network.

ST1011
APPLICATION DEVELOPMENT
Aims to equip students with the fundamentals of problem solving with C# programming and application design. A wide variety of programming problems will be introduced. The module covers the advanced Object-Oriented concepts such as inheritance and polymorphism. Essential application development topics such as UI programming and database programming are also included. Upon the completion of the module, students will be better equipped with problem solving techniques to design and develop robust applications with C#.

ST1012
PROGRAMMING FUNDAMENTALS
Teaches students programming fundamentals and object-oriented concepts using Java. Students will be taught programming fundamentals such as data types and operators, control structures, methods and arrays. Object-oriented concepts will also be introduced. At the end of the module, students will be competent in using programming for problem solving.

ST2107
DIGITAL MEDIA FOR BUSINESS
Trains students with basic design and video production skills to create an effective branding and advertising campaign. Students will apply creative concepts to campaigns using offline and online mediums such as collaterals, website and videos. Students would be able to apply the use of design principles and their skills in video production to create compelling digital content to help market and brand products.

ST2108
BUSINESS MARKETING AND BRANDING
Teaches students essential skills required to understand markets, customers and trends, to develop a brand strategy, to create a marketing plan and to gain market acceptance with a limited capital.

ST2109
BUSINESS OPPORTUNITY
Provides students an understanding on what it takes to be a successful entrepreneur, to learn how to spot an opportunity that could potentially culminate in a successful venture, to innovate on existing ideas using the fundamental concepts of Disruptive Innovation, to use best practices when conducting due diligence or research, and to communicate the true essence of these ideas to potential partners and investors for it to take flight.

ST2111
MOBILE APPLICATION DEVELOPMENT I
Teaches students programming concepts using JavaScript. Fundamental programming constructs such as data types, operators, control structures, classes, methods and arrays will be covered. In addition, students will learn how a cross-platform development tool such as PhoneGap can be set up and used with JavaScript to create mobile applications. The process of deployment and publishing of mobile applications will also be taught.

ST2219
ENTERPRISE BUSINESS PROCESSES
Provides students with broad-based understanding of how basic business processes in the areas of accounting, materials management, procurement, production, sales and services are represented within an Enterprise Resource Planning (ERP) solution.

ST2220
WEB APPLICATIONS DEVELOPMENT
Covers the techniques and skills required to set up a dynamic website integrated with database. Students will learn about server-side programming and be able to create database-driven websites using a scripting language. This module also covers object-oriented features of the scripting language. Students will also learn to incorporate server-side and multi-user interactivity in their web based application.

ST2223
BUSINESS PLANNING
This module provides the students with a fundamental understanding of developing a business strategy for innovation and success, writing a detailed business plan, identifying revenue streams for their business, developing a sound financial plan, business valuation and exit strategies.

ST2224
SOCIAL MEDIA ANALYTICS
Introduces students to the processes for analysing unstructured textual data on social media platforms. Students will learn to collect, prepare and analyse social media data with social media listening tools. With this knowledge, students will be able to improve marketing of products and services using best practices. They will also learn to use text analytics to discover interesting patterns and gain insights to support decision making as well as to provide recommendations.

ST2225
INTERACTION AND VISUAL DESIGN
Provides students with skills to act as inquiring and thinking visual communicators in the area of interactive applications. It aims to develop a working knowledge of the interaction and visual interface designs. Students will learn about interaction design principles, visual design topics like colour theory and screen typography and translate them into visuals and metaphors that will help illuminate the interaction between users and its contents.

ST2226
MOBILE APPLICATION DEVELOPMENT II
Equips students with skills in developing cross-platform mobile applications. Users will learn to develop apps which utilise mobile interface components, geolocation and maps, store data in device, and import web content. Examples of cross-platform tools to be used are JQuery Mobile and Phonegap.

ST2227
BUSINESS ANALYTICS
Teaches students the concepts and applications of different analytical techniques such as association rules and clustering to solve different business objectives. Students will be taught how to segment and profile customers so that they can better understand them and know when to market to the right customers with an objective to increase the return on investment for the business. Students will learn how to explore and mine data, apply the different algorithms to different contexts, interpret the generated solutions and provide insightful findings to management for decision-making.

ST2230
DIGITAL ANALYTICS
Equips students with the skills and knowledge to analyse and optimise website performance with the use of web analytics software. Students will learn to plan and measure the effectiveness of online marketing campaigns and make recommendations for improvement. They will use various strategies for Search Engine Optimisation (SEO) analysis and learn how to avoid penalty by search engines.

ST2312
BUSINESS INTELLIGENCE
This module aims to teach students how to collate, organise, analyse and present business data to decision makers so as to facilitate scientific and fact-based decision-making. Students will be taught how to integrate the data from across the enterprise and produce reports and Business Intelligence dashboards including graphs, charts, grouped summary reports with drill down capability for analysis. Students will learn to master Business Intelligence software and reporting tools, to systematically collate data from multiple sources, analyse and visualise data, produce reports and present the findings to management.

ST2320
FINAL YEAR PROJECT
Provides students an opportunity to integrate knowledge and technical skills they have acquired from the course and experience problem-solving, project management, communication and working in a team to develop projects related to business and information technology. In the project, the students are expected to apply the problem analysis, solution design and technologies they have acquired throughout the course.

ST2321
INFOGRAPHICS
Provides students with skills to translate data into visually compelling graphics to effectively simplify and present it in an engaging and informative way. It aims to develop a working knowledge of basic principles of design and visual communication. Students will learn about understanding data information hierarchy, planning and wire framing, illustration and iconography and using the right tools to translate it into an appropriate medium.

ST2322
PREDICTIVE ANALYTICS
This module introduces students to the concepts of Predictive Analytics and how Predictive Analytics can be applied to improve business performance. Students will learn techniques such as decision trees and regression analysis and use them to build predictive models which can be used by organisations to achieve business targets such as increasing profits or reducing costs.

ST2410
COMPUTER ARCHITECTURE AND OPERATING SYSTEMS

Provides students with an understanding of the basic architecture of computers, data representation, process and memory management, concepts and functions of operating systems. The fundamental concepts taught in this module will serve as a basis for students to continue their study in the field of IT.

ST2411
PROGRAMMING IN PYTHON AND C

Aims to develop fundamental programming skills in students through learning an imperative programming language and a scripting language. The basic programming techniques and constructs in these two types of programming languages will be explained, including regular expressions, recursions, pointers, functions, structs and modules. The module strives to build up the foundation in programming and develop students towards problem solving.

ST2501
NETWORK SECURITY

Provides students with a foundation on networking protocols, network security, and intrusion detection, hence securing the organisation's wired and wireless network infrastructure. The topics to be covered will include understanding of common communication protocols on the Internet like TCP/IP, HTTP, FTP, SMTP, as well as security protocols like SSL and IPSEC. It will also discuss network security threats and attacks, designing resilient networks, configuring of network components like firewall, setting up Virtual Private Network (VPN) and secured wireless connections.

ST2502
COMPUTER LAW AND INVESTIGATION

Examines the criminal trial process and cases involving computer hacking, denial of service, modification of data, distortion and fabrication of information. Students will examine the Computer Misuse and Cybersecurity Act, Evidence Act and the Criminal Procedure Code when dealing with the various cyber threats issues.

ST2504
APPLIED CRYPTOGRAPHY

Teaches students the principles and application of cryptography to secure data and network. Different encryption algorithms and techniques will be introduced, including conventional and public-key cryptography, authentication and digital signatures. Students will learn to apply these concepts to secure and authenticate electronic mails and messages. Key management, digital certificates and public-key infrastructure will be discussed to understand the deployment of public-key cryptography.

ST251Z
ETHICAL HACKING AND DEFENCES

This module provides students with a foundation on network protocols, network security, secure coding and penetration testing to protect computer resources. Students are taught offensive and defensive skills for the organisation's wired and wireless networks in order to protect important assets against hackers.

ST2510
INDEPENDENT STUDY I

Aims to provide opportunities for students to study in-depth an area of interest related to their field of study. Students will demonstrate their knowledge, skills and competencies in the chosen field of study through various means such as case study reports, prototypes, presentations or participate in national level competitions.

ST2513
MOBILE APPLICATIONS

Imparts general domain knowledge in the area of mobile applications development. The architecture of the mobile network, the operating systems used in different mobile devices as well as the software tools used for mobile applications development will be taught. Students will also understand how deployment and bringing the application to market are done. On completion of the module, students will also be able to program, among others; user interfaces, persistence storage, 2D graphics and location-aware applications using Android as an example platform.

ST2514
DIGITAL FORENSICS AND INVESTIGATION

Equips students with the fundamental concepts and techniques of computer and mobile forensics. Students will learn to acquire, analyse and present both computer and mobile data as evidence. This module will cover tools and techniques of computer and mobile forensics, data recovery, imaging and storage of electronic evidence.

ST2515
SECURE CODING

Covers the concepts and fundamentals of secure coding principles, and techniques to prevent security vulnerabilities in web applications. Through a series of hacking and coding practical exercises, students will learn the implications of insecure code in applications and subsequently how to defend their web applications against potential hackers by coding securely.

ST2601
INFOSEC PROJECT DEVELOPMENT AND MANAGEMENT

Provides students with an opportunity to integrate knowledge and technical skills learnt from the DISM course. The students will do a project related to Information Security and in the process, learn problem solving, communication and teamwork. In the project, the students are to apply problem analysis, investigation, solution design and implementation skills. In addition, project management will also be taught.

ST2610
SECURITY POLICY AND INCIDENT MANAGEMENT

This module equips students with the fundamental concepts and techniques of security policy and incident management. Students will learn the essentials of security policy development, risk assessments and security models. Students will also learn to monitor security events, perform network forensics analysis and proactive detection of attacks, and be introduced to security incident response.

ST2612
SECURING MICROSOFT WINDOWS

Aims at equipping the students with hands-on knowledge in securing and hardening a Windows operating system. The course will cover the security mechanism used in the operating system, configuring different levels of security measures, best practices and security related tools and utilities.

ST2613
SECURING LINUX

Aims at equipping the students with hands-on knowledge in securing and hardening a Linux operating system. The course will cover the security mechanism used in the operating system, configuring different levels of security measures, best practices and security related tools and utilities.

ST2615
INDEPENDENT STUDY II

Provides opportunities for students to study in-depth an area of interest related to their field of study. Students will demonstrate their knowledge, skills and competencies in the chosen field of study through various means such as case study reports, prototypes, presentations or participate in national level competitions.

ST2617
MALWARE REVERSE ENGINEERING
Equips students with the basic knowledge of malware analysis to reverse-engineer the malware using practical tools and techniques. The three phases of behavioral, code and memory analysis of malware will be taught. Students will learn how to explore and understand the key characteristics of malware and the techniques of reverse-engineering compiled Windows executables and browser-based malware.

ST291Z
3D LEVEL DESIGN AND SCRIPTING STUDIO
Aims to equip students with the ability to build a complete playable digital 3D game level from scratch. Students will be able to plan, conceptualise, design, script and develop a 3D game level using digital content creation tools in combination with a game engine. Students will learn how to create 3D models, texture them and import them into a game level. Students will also learn how to utilise a game engine to create rooms, terrains, materials, particle systems, lighting, as well as scripted, interactive animations.

ST292Z
3D GAME DEVELOPMENT STUDIO
Equips students with the knowledge of good design practice in game development project which incorporate game mechanics, physics and AI. Students will use a 3D game engine commonly used in the industry and be able to output their games to multiple platforms. Emphasis will be placed on the whole studio pipeline from concept to release. At the end of this module, students should have developed a complete playable game for their portfolio.

ST293Z
SOFTWARE ENGINEERING PRACTICE
This module allows students to create interactive applications with graphical interface that will illuminate the interaction between users and its contents. Subjects like colour theories, screen typography, visual thinking processes, and interface design principles will be taught in this module.

ST3001
WEB STACK FOR BUSINESS
This module teaches students basic coding and familiarises students with various technologies used to create functional applications. The module also introduces the students to prototyping tools that allow business students to design user-centric applications.

ST4011
FUNDAMENTALS OF WEB DEVELOPMENT TECHNOLOGY
This module provides the students with the knowledge and skills to understand different evaluation strategies for a user interface prototype and design as well as develop interactive web application. Topics covered include Internet and HTTP protocol, basic web design principles, web interface and navigation, HTML, hypertext links, images, tables, frames, forms and different evaluation methods. Students will also be taught how to apply Cascading Style Sheets to maintain consistencies across web pages. It also provides an overview of other web technologies such as Web Client programming with Javascript, Web Development Methodology and Web Development Platforms In addition, students will appreciate various hardware and software platforms, and learn basic web administration.

ST4012
WEB PROGRAMMING
This module teaches techniques and skills required for client-side web programming. Students will learn to use JavaScript and JQuery for client-side programming to manipulate the DHTML object model to achieve dynamism in web pages. Students will also be taught how to adapt their web pages for mobile devices using HTML5 and JQuery Mobile for viewing on mobile web browsers. Usage of Cordova to convert the mobile JQuery webpage to a native mobile app will also be covered.

ST4013
JAVA PROGRAMMING
This module teaches object-oriented programming and problem solving using Java Programming Language. It equips students with skills in design, development, test and deployment of enterprise application. Topics covered include language basics, creating and communicating with objects and graphical user interface, interfaces and abstract classes and multi-threading. At the end of the module, students will be competent in developing Java applications with an interactive user interface, in an object-oriented approach.

ST4021
ENTERPRISE APPLICATION DEVELOPMENT
This module teaches the basic features of the server side programming (Java Server Pages, web services and database) and its application to Internet. Students will be able to develop a mini Java client/server project over the Web. The topics covered in this module include Database Access, JavaServer Pages, Cookie and Session Objects and web services. Students will also be taught on how to host their application on a free cloud hosting platform for public access on the Internet. At the end of the module, students will be competent in developing Java server web applications, which can access data from an enterprise level database hosted on the server.

ST4024
DATABASE MANAGEMENT SYSTEMS
This module introduces the fundamentals of the relational database model. Key topics include information modelling, normalisation, database design, stored procedure and database implementation. Structured Query Language (SQL) will be used to create, manipulate and retrieve data in a relational database.

ST5050
GRAPHIC DESIGN USING IMAGING TOOLS
Aims to provide students with the fundamental techniques of image processing for graphic design using Adobe Photoshop. At the end of the module, students would be able to translate their creative concepts into digital artworks for use in screen and print media design.

ST5053
INTERACTIVE AUTHORING
Aims to equip students with the knowledge and skills in integrating different media into an interactive multimedia application. Students will be familiarised with industry standard software and basic scripting techniques to implement 'proof of concept' as well as generate supporting documentation to describe its interactivity, functionality and as well as map out its information architecture.

ST5056
INTERACTIVE WEB DESIGN
Aims to equip students with knowledge and skills in digital video production. Students will be taught the fundamentals of digital video technology and be able to use a nonlinear editing system to create a video for multimedia application. Students will be required to create a video presentation based on specifications provided. Aims to equip students with the knowledge and skills to build commercially viable websites. This involves learning to build simple interactive functionality with web backend technologies and applying them in greater depth to design websites that have a competitive edge.

ST5059
DIGITAL VIDEO
Aims to equip students with knowledge and skills in digital video production. Students will be taught the fundamentals of digital video technology and be able to use a nonlinear editing system to create a video for multimedia application. Students will be required to create a video presentation based on specifications provided.

ST5061
GRAPHIC DESIGN USING IMAGING TOOLS I
Students will learn the fundamental techniques of image processing for digital imaging and graphic design using Adobe Photoshop. At the end of the module, students would be able to translate their creative concept into digital artworks to be used in screen and print media.

ST5062
GRAPHIC DESIGN USING IMAGING TOOLS II
Students will learn the basic techniques and skills of digital illustration using vector based software such as Adobe Illustrator. They will be able to create and transform their creative ideas into sophisticated graphics for use in print and any dynamic media.

ST5063
3D CONTENT DEVELOPMENT
This module will introduce students to the basic concepts involved in creating 3D media content using professional digital tools. This module introduces the fundamental techniques and terminology of 3D modelling and texturing, which will enable students to apply these skills in the production of 3D assets within the digital realm. Students will be trained using dedicated 3D software tools such as Autodesk Maya.

ST6100
ANIMATION STUDIO I
Aims to provide students with primary production knowledge in integrating their previously learnt skill sets ranging from modelling to rendering to comprehensively develop and manage a short animated film production. Students are to create standard production timelines based on their presented ideas and encouraged to utilise simple assets created in the Introduction to 3D Computer Graphic module where possible to produce and deliver an entertaining and informative 3D animated video clip.

ST6105
HISTORY OF ANIMATION
Aims to explore the origin and development of animation as an effective medium for storytelling and entertainment in general. Students will be introduced to many important milestones in animation industry including the development of sequential art, classical hand drawn animation and 3D animation technology. This module will also help them to identify various art styles in animation around the world with a focus on Asian region.

ST6107
GRAPHIC DESIGN PRINCIPLES
Aims to provide students with basic skills and knowledge of graphic design. Areas covered include principles and elements of design, typography and graphic software such as Photoshop and illustrator. This module would provide students with opportunities to expand the various aspects of design and integrating them into other modules.

ST6108
TRADITIONAL ANIMATION
Aims to introduce students to the basic concepts involved in traditional animation. It utilises one of the most basic animation toolsets — the pencil and paper — and introduces students to fundamental animation terms such as key drawings, in-betweens, exposure sheets and to principles such as timing, spacing and squash and stretch. This module will enable the students to apply these concepts in the production of hand-drawn animation.

ST6109
FIGURE PROPORTION AND ANATOMY
Aims to build upon the concepts taught in Drawing with further emphasis on figure drawing. Students will study basic human anatomy like muscles, skeleton, and basic human proportion. This module will help prepare the students for the Character Design module.

ST6110
ENVIRONMENT AND PROP DESIGN
Aims to build upon students' perspective drawing skills and utilise them to design sets and props for animation production. Students will explore interior and exterior set designs, as well as props such as weapons and vehicles. This module will better prepare them for the Conceptualisation and Layout module.

ST6111
3D ANIMATION FUNDAMENTALS
Aims to cover the traditional animation principles in-depth and adapt them for 3D. Through hands-on practical lessons, students will use professional 3D animation software to adopt a proper organised approach to computer animation and learn techniques for creating convincing movement. At the end of the module, students are expected to demonstrate an understanding of body mechanics and produce entertaining pieces of 3D animation involving anthropomorphic and basic humanoid characters.

ST6112
DRAWING
Students taking this module will work with a variety of drawing media such as charcoal and pencil to develop line, shape and tone to arrive at an integrated image. Through drawing exercises that cover areas like texture and volume, space relationships, proportion, perspective, human figure and composition, students will learn both analytical and inventive components of the drawing process.

ST611Z
GRAPHIC DESIGN PRINCIPLES
Aims to provide students with the basic skills and knowledge of graphic design. It offers students an insight into traditional and digital mediums used. Areas covered include principles and elements of design, colour, typography, history of art and design as well as graphics software. Students will explore and apply their knowledge through their assignments. This module would provide students with opportunities to expand the various aspects of design and integrating them into other modules.

ST612Z
3D FUNDAMENTALS
Aims to equip students with the basic knowledge of 3D computer generated imagery. Students will learn how to perceive objects in 3D space and be taught the techniques for modelling, texturing, lighting, rigging, animating and rendering using state-of-the art 3D software. Through practical sessions, students will be able to apply their creativity and design skills to visualise and build interesting 3D models and animate them. The module will encourage the students to showcase their artistic talents in developing quality 3D content for product visualisation, games, movies and advertising posters.

ST613Z
INTRODUCTION TO 3D COMPUTER GRAPHICS
Aims to equip students with essential knowledge of 3D computer graphics. Students will learn how to model, texture, rig, light and render using the latest 3D technology. Through practical sessions, students can develop their skills and creativity to create digital artwork that can be used for games/ product visualisation, etc. The module will let students explore many disciplines in the 3D animation pipeline.

ST6203
VIDEO AND AUDIO FUNDAMENTALS
Aims to train students in basic video production. Student will learn essential camera functions and grammar of shots. Students will plan, shoot, edit the sequence and export the video for delivery. For audio, students will learn to select the required audio formats. They will also be taught how to edit and export audio. Students will be required to combine video and audio to produce a presentation of good quality.

ST6219
ACTING FOR ANIMATION
Aims to provide students with a foundation in acting, improvisation, characterisation techniques and directing. No prior knowledge in acting is required. The module will be taught using a series of interesting practical lessons. Students will be able to craft their acting and basic directing skills, and apply the techniques learnt in their animation productions.

ST6223
VISUAL STORYTELLING
Aims to equip students with fundamental storyboarding and storytelling skills to craft dramatic stories for animated film. Students will acquire knowledge of visual grammar and narrative styles, practical skills in drawing, visual and story design, scriptwriting basics and be able to conceptualise effective storyboards for a variety of emerging media formats and story forms. Students will get to demonstrate their creativity and imagination in creating their projects which can be further developed should they go into the production stage.

ST6224
3D BODY MECHANICS
Aims to cover full-body bipedal character animation for action shots at an intermediate level. Students are to learn and understand weight shifts, and animate 360 degrees full body mechanics that can be used in games. They learn to create, edit and source for their own video references, pick up detailed motion and, utilising the 12 Principles of Animation, animate a series of action exercises that they can showcase when applying to game companies.

ST6226
DIGITAL LIGHTING AND RENDERING
Aims to equip students with essential lighting and rendering skills required to furnish a 3D scene. Various lighting and rendering methods will be covered throughout this module to provide students with a better understanding of their applications.

ST6227
DIGITAL 2D ANIMATION
Aims to build upon the knowledge gained in the Traditional Animation module and expose students to the concepts and techniques involved in 2D animation using professional digital tools. It allows students to produce their work in a significant digital environment in addition to pencil and paper. This module further emphasises the principles of animation including line of action and solid drawing, and introduces students to modern digital animation approaches such as the use of multi-plane cameras and limited animation. Students will then apply these concepts to produce 2D animation within the digital realm.

ST6228
3D CHARACTER ANIMATION
Aims to build upon the animation concepts taught in the 3D Body Mechanic module. This module will focus on creating performing characters in a character driven scenario or story. It will expose students to specific approaches for character animation such as facial animation and lip sync. Students will be taught how to make their digital actors act and display convincing emotions.

ST6229
ANIMATION STUDIO II
Aims to provide students with primary production knowledge in integrating their previously learnt skill sets ranging from modelling to rendering to comprehensively develop and manage a client-based short animated production. Students will be exposed to multiple usage of animation in variety of external live projects (e.g. medical visualisation, food industries, TV commercial) along with their entrepreneurship aspects.

ST6230
3D ANIMATION
Aims to cover the traditional animation principles and adapt them for 3D. Through hands-on practical lessons, students will use professional 3D animation software to adopt an organised approach to computer animation and learn techniques for creating convincing movement. At the end of the module, students are expected to demonstrate an understanding of body mechanics and produce entertaining pieces of 3D animation involving anthropomorphic and basic humanoid characters.

ST6231
PORTFOLIO DEVELOPMENT
Aims to explore traditional and existing portfolio methods as well as emerging technologies to create students' personal portfolio. It investigates strategies to enhance one's portfolio. The module also identifies key presentation techniques that can be applied to improve students' ability to communicate their creative ideas and choices to an audience in a clear and effective manner.

ST6232
FIGURE DRAWING FOR ANIMATION
Aims to build upon the concepts taught in Drawing with further emphasis on figure drawing. Students will study basic human anatomy and be taught the techniques for drawing human figures and capturing poses using methods such as contour and gesture drawings. Drawing for weight, force, emotion, thought and movement are stressed. Character design and development will be realised through descriptive drawing for 3D animation production.

ST6233
RIGGING FUNDAMENTALS
The aim of this module is to familiarise students with the basic technical knowledge and skills in handling the rigging fundamentals across the animation pipeline. At the end of the module, students will be able to practice these applications in setting up assets, performing technical animation, and practices post-production tools.

ST6234
CHARACTER DESIGN
Aims to equip students with basic character design elements. This module will explore different style and genres of character designs, character poses and expressions as well as digital painting. This module will prepare the students for Conceptualisation and Layout.

ST6235
CHARACTER MODELLING AND SETUP
Aims to impart knowledge in the fundamentals of organic character modelling, UV mapping, basic texturing and rigging. Students must have passed their Introduction to 3D Computer Graphics module prior to taking this module. Students will tap into their understanding of the aesthetics and anatomy of figures gained from the Figure Drawing and bridge their art and technical knowledge in the 3D character creation process.

ST6236
DIGITAL CREATURE MODELLING AND SCULPTING
Aims to build upon the fundamental concepts and techniques of organic modelling covered in Character Modelling and Setup. Students will learn to use advanced digital modelling tools to generate industry standard texture maps and sculpt high-fidelity creature model based on an originally developed or assigned design. This module will also incorporate intermediate level of shader engineering and lighting setup which further amplify the model's aesthetic.

ST6237
ENVIRONMENT AND PROP MODELLING
Aims to equip students with necessary technical skills to generate professional-looking terrains, interior and exterior models as well as their shaders. This module also focuses on up-to-date prop modelling and texturing techniques by utilising the latest professional software and plug-ins.

ST6238
ADVANCED LIGHTING AND RENDERING
Aims to equip students with high-end lighting and compositing techniques. Student are tasked to explore multitude of light parameters and their visual application. They will then apply these knowledge along with post-production effects to generate variety of ambiances and moods according to the intended scenarios.

ST6239
CONCEPTUALISATION AND LAYOUT
Aims to equip students with knowledge of the animation pre-production process. They will revise the storytelling concepts covered in the Visual Storytelling module and discover various visual styles in animation. They will also learn about creating mood in a scene via staging and lighting design, as well as cinematic continuity and editing. Students will then apply the concepts taught and generate story ideas, concept art, storyboards, layouts and animatic which they can use in the Animation Studio III module.

ST6267
BASIC DYNAMIC SIMULATION
Aims to equip students with fundamental knowledge in the creation of character animation's interaction with props that simulate dynamics such as dust, smoke, fire, and water. This module will also cover other effects based animation such as rigid/soft body dynamics.

ST6268
INTRODUCTION TO GAME ART INTEGRATION
The aim of this module is to introduce animation students to the pipeline of 3D game development, focusing on the role of animators, modellers and lighters. Students will be using an industry standard game engine for this application. At the end of the module, students will be able to use the game engine to import a 3D character, props and environment from Maya, test their animation, and light a scene.

ST6310
ADVANCED DRAWING
Aims to explore the relationship of figure drawing between animation and the conceptualisation process. Students need to articulate a visual story which they prepare for the animation production to demonstrate how its mythology and humanity is reflected in the characters design using life drawing principles. Integration of directorial art style, environment and choice of medium would be applied in their Animation Production module.

ST6332
CREATURE EFFECTS
Aims to provide students with advanced dynamic simulation that are reactive to character animation and its surrounding. Creature Effects specifically explore application of cloth, hair, fur and muscle simulations to a character including their implementation in character animation pipeline. The aforementioned simulations are constructed on top of an animatable characters or objects that are relevant to high-end TV production.

ST6333
INDEPENDENT STUDY
Aims to develop students' critical understanding of a field of study related to digital animation and their capacity to pursue independent research, culminating in an assignment presentation which will demonstrate their knowledge and competence in the chosen field of specialisation.

ST6334
ANIMATION STUDIO III
Aims to provide students with the opportunity to apply concepts and techniques learnt into managing and executing real-world animated film projects. Students may utilise assets created in the Conceptualisation and Layout module or generate new story ideas and create an animated film through full production pipeline to final delivery. In addition, the module will include workshops conducted by industry professionals to provide insights and assist students in organising and producing work in line with professional practices.

ST6403
DIGITAL PHOTOGRAPHY
This module aims to equip students with digital photography skills. The fundamental techniques used to achieving good photographic images and composition will be taught to prepare student in their visual and concept development. The understanding of exposure, light quality and depth-of-field will enable the students to effectively translate their vision into still images of art. Studio lighting techniques and digital imaging skills will also be taught to give a broad learning exposure for the student.

ST6404
CREATIVE STORYTELLING
This module covers the strong foundational elements of storytelling which includes theme, character, perspective, setting, plot, and dialogue. It encompasses visual media such as short visual effects stories, drama, and film. Through a series of creative writing exercises, students practice developing stories with both words and images through storyboards.

ST6405
PRE-VIZ AND STORYBOARDING
This module aims to equip students with fundamental storyboarding and pre-visualisation skills to craft animatics for film, video and digital new media. Students will acquire knowledge to utilise tools to visualise lighting, camera placement, movement, stage direction and editing before they start shooting, thus without having to incur the costs of actual production.

ST6406
MEDIA THEORY
This course will illustrate with screenings and combine discussions of both the history and practice of visual effects and motion graphics. The goal is to explore the rich opportunity visual effects and motion graphics offers to enhance story and the entertainment. Students will be introduced to many important milestones in both the visual effects and motion graphics industry and analyse creative problem solving that went into early works, and how it compares to what is done today.

ST6407
MOTION ANALYSIS AND TECHNIQUES
This module is designed to equip students with an ability to translate motion graphics theory to practice. Students will demonstrate an understanding of basic design principles as applied to motion graphics such as intonation, wave motion, laws of motion and principles of animation. Students will develop the ability to generate meaning through minimalism and abstraction.

ST6408
COMPOSITING FUNDAMENTALS
This module aims to educate students on the fundamentals of compositing used in the media industry. Students will learn how to approach effects on footages of various nature and apply fundamental compositing skills such as roto-scoping, basic matte creation and set extension. The skills learnt in the module can then be applied to other modules in the course.

ST6501
EFFECTS ANIMATION
Aims to introduce students to basic effects animation such as particle systems and dynamics simulation. Students will be exposed to the art and techniques of creating convincing effects and utilise the latest professional software and plug-ins to produce animation of fluids, cloth and explosions.

ST6504
DIGITAL MATTE PAINTING AND LAYOUT
Aims to train students the various techniques involved in creating digital environments. Digital matte painting combines elements of photography, simple 3D models and freehand painting techniques within Adobe Photoshop to merge the boundaries of realism with digital painting to create stunning backdrop elements for use in visual effects production. Students will be familiarised with the techniques used in matte painting such as exposure, light quality, depth and atmosphere, integration and the painting process. They will also use various types of photo manipulation and hand painting methods. Many challenges are addressed, such as skies, water, architecture, linear perspective and atmospheric perspective. By the end of the course, students will have acquired skills to produce a moving 3D digital environment that integrates with their live action and other CG elements.

ST6505
SPECIAL EFFECTS
Introduces the fundamentals of set dressing, props, practical effects and special effects make-up. The module focuses on the research and implementation of the scenic elements to establish a unified visual style for video production. They will present their designs through drawings, prototypes and media.

ST6506
MOTION CAPTURE
Students will learn the basics of capturing full body movement in the motion capture studio based on a live actor and apply this motion data to a rigged character. They will be able to take motion capture source and convert it into a format that MotionBuilder natively understands and then use that mocap data to create new and life-like animations quickly and easily.

ST6507
DIGITAL COMPOSITING
This module aims to train students with compositing concepts such as multipass compositing, matte extraction, rotoscoping, colour correction and related compositing techniques used in the production of movies and motion graphics. Various compositing effects will also be incorporated. This module provides students with an opportunity to apply their compositing skills to their footages to enhance their sequence.

ST6508
DYNAMIC TYPOGRAPHY
In this class, students will be introduced to strategies of visual communication through kinetic elements, focusing on form, speed, rhythm, orientation, colour, texture, and quality of motion. Students will explore the expressive potential of typography in a variety of exercises dealing with dynamic typography and motion graphics. Students explore and experiment with typography in print expressed and unleashed in motion. Through analysing contemporary and historical examples, such as film and TV titles, music videos, commercials, as well as exemplary typography work in print design students will develop their own potential for expression trough dynamic typography. Each student will give a research presentation about a designer and discuss his or her contributions to design, animation, and typography.

ST6509
3D FOR VISUAL EFFECTS
Aims to equip students with fundamental knowledge in the creation of Photo Realistic 3D assets to be integrated with live action footage. Students will be taught 3D texture painting, digital lighting using HDRI, rendering techniques such as raytracing, global illumination, caustics and multi-pass rendering. It will also cover virtual set creation/extension using camera matching and projection techniques.

ST6510
BROADCAST DESIGN
This course is a comprehensive approach to design and branding for broadcast networks. Students create and pitch concepts, make storyboard presentations and as the final project, totally re-brand and re-design a network, including creation of a presentation book of their storyboard concepts and an animated montage of their redesign for the network.

ST6511
MEDIA BUSINESS
This module is designed to provide students the fundamentals awareness in the business aspect of the media industry. Students will be required to research and discuss about the valuation of art and design and put theory into practice. Students will be provided with the necessary information for the development of critical and practical skills in the area of media production such as self-promotion, understanding copyright laws, censorship and interpreting financial reports and statements.

ST6512
PRODUCTION FOR VISUAL EFFECTS
This module aims to train students to be competent in video production to support visual effects projects. It will expose them to video production and post-production processes and workflow. It will foster the appreciation of film as an art form and the development and impact of CG in filmmaking. Students will be introduced to the history of visual effects and how it has evolved over time. Students will be familiarised with the techniques and application of video production including cinematography, lighting and stereoscopic 3D. Students will produce their own short film integrating live action and CG elements based on the skills acquired from the module.

ST656Z
DIGITAL COMPOSITING
This module aims to educate students on advanced compositing skills used in the media industry. Students will be taught 2D and 3D compositing workflow and will apply compositing methods such as edge blending and de-spilling for green/blue screen. Skills learnt in this module can then be applied to other modules in the course.

ST6601
ADVANCED MATCHMOVING TECHNIQUES
This module covers intermediate and advanced concepts in visual effects such as matchmoving/tracking. Students will acquire skills to use their captured video's motion to create a camera move to matchmove their 3D objects. They will also cover mode advanced skills such as object motion tracking to add a 3D effect to an actor's face. This module allows an opportunity for students to integrate their assignment with other modules across this level, applying their compositing skills to integrate live action footage with CG for their visual effects sequence.

ST6603
VISUAL EFFECTS STUDIO
Students will work in teams to produce visual effects clips. Student will learn to manage the entire visual effects pipeline from initial concept and development to final delivery. The processes include initial concept creation, storyboard presentation, shooting live action, matte painting, wire removal, rotoscoping, modelling, matchmoving, tracking and compositing. Students are required to provide the visual effects breakdown. The module will also include workshop on professional practices, presentations and portfolio development to assist students in documenting and organising their work for further studies or job opportunities.

ST6604
INDEPENDENT STUDY
Aims to develop students' critical understanding in an area of study related to visual effects and motion graphics, this module focuses on their capacity to pursue independent research and the implementation of such effort. Students are required to complete and present a project, to demonstrate their in-depth knowledge and competency, in the chosen premise.

ST8021
MOBILE USER INTERACTION
This module aims to provide students with the skills in designing usable applications for web on mobile platforms, such as smart phones and tablets. Students will be equipped with skills to create interactive mobile web applications using tools such as HTML5 and Mobile jQuery which could be viewable on mobile phone browsers. Students will be taught theories of user-centric design, usability engineering and human-computer interaction principles to provide in-depth understanding of implementing good mobile-web application experience.

ST8022
MOBILE APPLICATIONS
The module imparts general domain knowledge in the area of mobile applications development. The architecture of the mobile network, the operating systems used in different mobile devices as well as the software tools used for mobile applications development will be taught. Students will also understand how deployment and bringing the application to markets are done. On completion of the module, students will also be able to program, among others; user interfaces, persistence storage, 2D graphics and location-aware applications using Android as an example platform.

ST8023
WEB SERVICES
The module provides students with knowledge and skills required to develop web services consumed by mobile applications, based on industry standards such as RESTful. At the end of the module, students will be competent in designing, implementing, testing and integrating web services.

ST8103
ACOUSTICAL SCIENCE
Aims to provide foundational understanding of the principles of acoustics related to musical instruments and physical environments. The mechanism of transducers as well as physiology of hearing are also covered to provide a broad understanding of the scientific principles used in Audio and Music Technology.

ST8105
RECORDING AND MIXING TECHNIQUES I
Introduces students to the field of sound recording and music production. The students will learn well-established techniques of recording and mixing using industry standard hardware and software. Students will learn about audio processes through practical exercises and critical listening.

ST8205
MUSIC THEORY II
This module aims to develop the students' understanding and application of contemporary music theory by exploring important techniques used in popular contemporary music.

ST8207
SYNTHESIS AND COMPOSITION II
Aims to produce a portfolio of short compositions utilising a variety of formal compositional procedures which are realised via computer programming. Students are introduced to fundamental computer programming concepts and to a number of approaches to algorithmically create musical material. These are applied to produce music in a number of different musical genres. In addition to refining the students' skills in using a Digital Audio Workstation, several advanced synthesis techniques are covered.

ST8208
ARRANGING
Aims to explore a variety of genres, as well as writing approaches. By analysing specific musical examples, students will be able to draw out the important elements in the different genres studied, and incorporate them into their own styles of writing.

ST8209
THE BUSINESS OF MUSIC
Introduces students to the business, legal, ethical and fiscal aspects of the music world and students will learn about its organisational structure including the different roles, major players and career opportunities in it. An introduction to entrepreneurial skillsets required in the modern online music environment will also be included.

ST827Z
PERFORMANCE PRACTICES
Provides a basic grounding in generic skills useful in common musical performance situations. In addition to introducing a structured approach to learning instrumental technique, the continuum between free improvisation and completely notated performance situations is explored in both solo and group choral/instrumental contexts. Students are also confronted with some of the logistical challenges of organising a performance.

ST828Z
RECORDING AND MIXING TECHNIQUES II
Aims to further students learning in recording and mixing techniques. They will be introduced to a greater variety of multi-microphone recording techniques. Students will also be taught how to apply digital signal processing to create a mix that best expresses the music they have recorded.

ST8304
AUDIO POST PRODUCTION
This module will establish the knowledge and the skills for creating and shaping a meaningful film and game sound design, starting with the base of recorded location sound. Each building block of the soundtrack will be examined for their narrative function. They will also be discussed in relationship to pre-production and production.

Students will practise sound-editing techniques and explore how sound textures and dynamics can shape the scenes and the characters, with considerations to meaning, rhythm, spatiality, mood and emotion. There will also be listening exercises to illustrate these facets of sound, and more importantly, to experience the effect of such choices.

ST8305
PORTFOLIO DEVELOPMENT
Assists the student to develop a professional portfolio. Students plan and produce two contrasting projects; these works showcase a variety of skills and knowledge that they have acquired during the course. Students are expected to present a proposal, arrange, compose, rehearse, record, and produce

their own original work. In addition, the students demonstrate their competence in event management by participating in a major show/production.

ST8307
SCORING FOR VISUALS
The module aims to equip students with the ability to apply appropriate compositional skills to support the intended emotions of moving images. Students will be exposed to the processes and practices of scoring and they will analyse the different functions of film scores through class discussions, activities and research. At the end of the module, students will be able to produce effective music that supports the required film content.

ST8308
SHOW PRODUCTION
This module aims to introduce students – working in production teams – to the design and the production of live events, with an emphasis on concerts, through the application and integration of the various aspects of show production such as creative direction, live sound, lighting, video/projection design, special effects, choreography/blocking, set design, and stage management. Students will also produce an audio and video recording of the show and be introduced to the fundamentals of show promotion and event management.

ST8309
ENSEMBLE LAB
Develops ensemble-playing proficiency in various genres, with a focus on developing appropriate articulation, phrasing, intonation, tempo and groove. Supervised rehearsals will explore the continuum between free improvisation and completely notated performance situations, different stylistic approaches, musical sensitivity, band dynamics, stage presence, and how to perform as a unit with melodic, harmonic and rhythmic precision.

ST8310
INTERACTIVE AUDIO
Interactive Audio applies computer programming concepts to create interactive music and audio systems. Using a programming environment optimised for creating music and audio applications, students will create a variety of synthesisers and signal processors, as well as design and build their own interactive performance systems.

ST839Z
SONG WRITING
Trains students in the techniques of writing a song. In particular, lyrics, melody, harmony and rhythm are identified and deconstructed in order to examine how the distinct components function in isolation, as well as in relation to each other. Different ways to start the process of writing will also be explored, and by the end of the module, students should be equipped with sufficient knowledge and practice to competently write their own songs. This module will also provide an overview of the history of popular Western music and the evolution of song styles, by examining the significant works of important songwriters from the 1920s to the present.

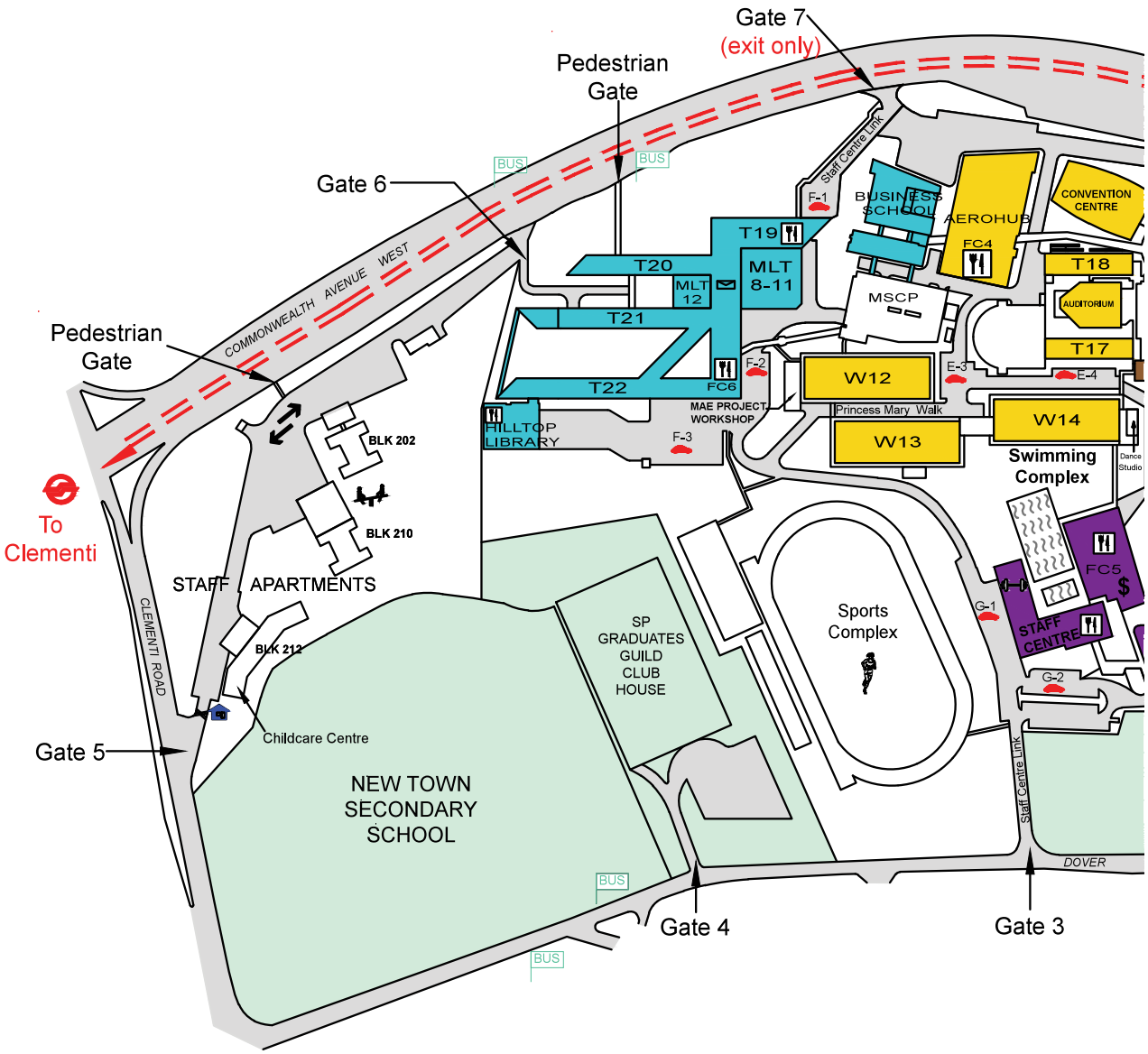
ST840Z
SYNTHESIS AND COMPOSITION I
Introduces basic concepts of musical organisation and techniques that enable music production with the aid of computers. Fundamental ways of structuring sound are explored using a variety of approaches, ranging from group improvisation using found objects, to using the computer to realise musical compositions with MIDI sequencing software. In addition, some commonly used synthesis techniques are systematically explored.

ST843Z
MUSICIANSHIP
Aims to develop the student's musicianship abilities through ear-training and keyboard skills. This module concentrates on the areas of rhythm and pitch reading skills, improvisation and playing by ear, so as to develop the ability to recognise, reproduce and notate musical elements. Basic keyboard skills will be taught from the perspective of using the keyboard as an efficient music production tool.

ST844Z
MUSIC THEORY I
This is a foundational module that aims to equip students with basic music theory skills. Students will acquire musical literacy, as well as basic analytical and harmonic skills. Emphasis is on the tonal harmony used in traditional Western music. Students will also be given an overview of the history of Western Art Music. They will examine significant developments and characteristics of the Common Practice Period, including some important composers and their works.

ST845Z
PRODUCTION LAB
Production Lab is a facilitated time and space for students to explore the entire production process at an elementary level, drawing connections between the concepts introduced in the first-year modules. Through exercises, presentations and reflections, the student will be exposed to various concepts that feed into the goals of the music production process as well as cultivate their sensitivity towards the supporting processes.

ST846Z
PRODUCTION WORKSHOP
Lecturers work on commercial music projects from individual music artistes, to bands, to music and audio for visual media. Mainly producing music from the ground up the way it would be done in the industry. These projects will bring together the various skills the students have learnt in DMAT and refine them to the standards required commercially. These products will eventually be released commercially to the public. Students will learn first hand what it takes to bring a musical or audio product into the market, by working alongside their lecturers.



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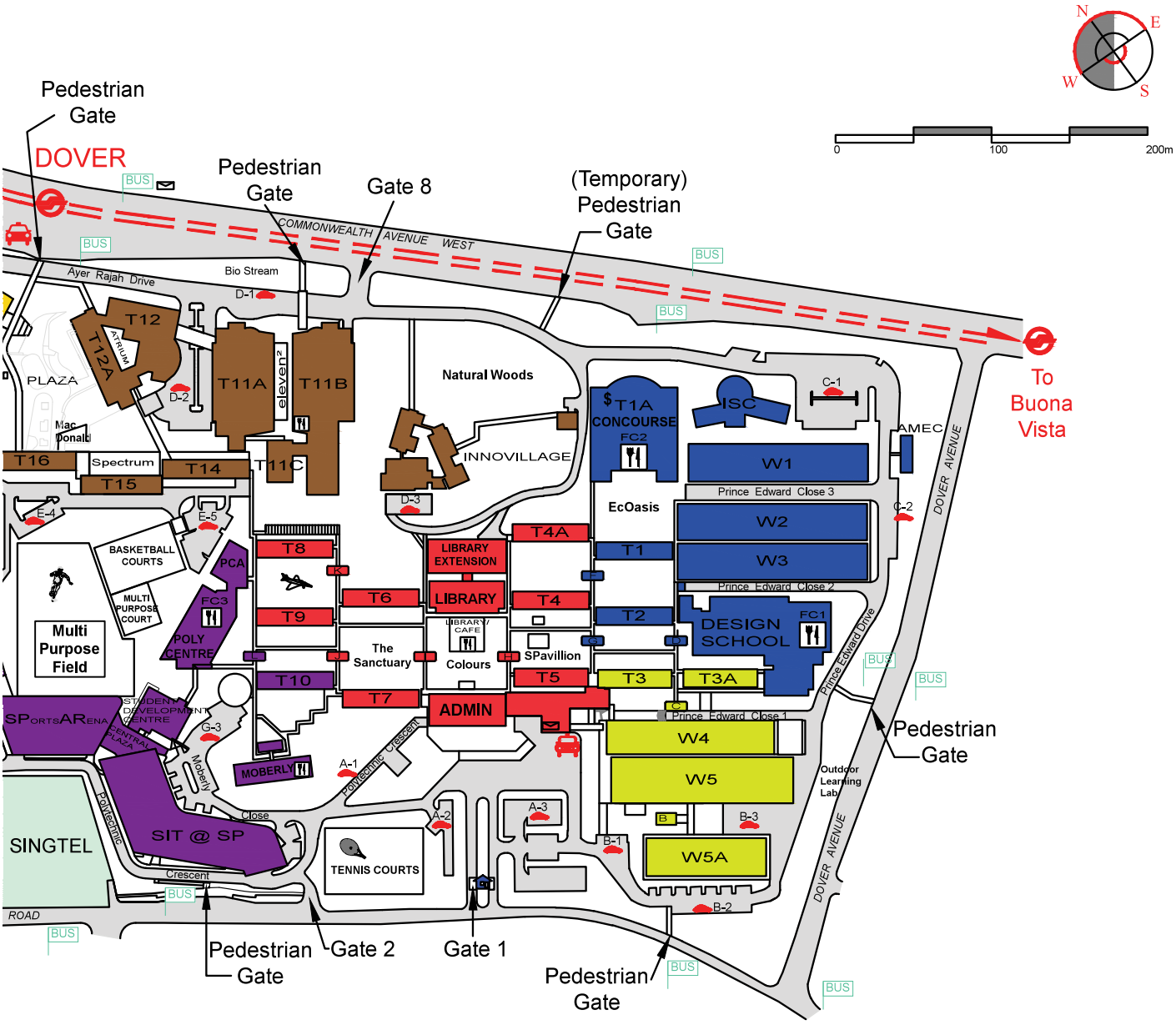

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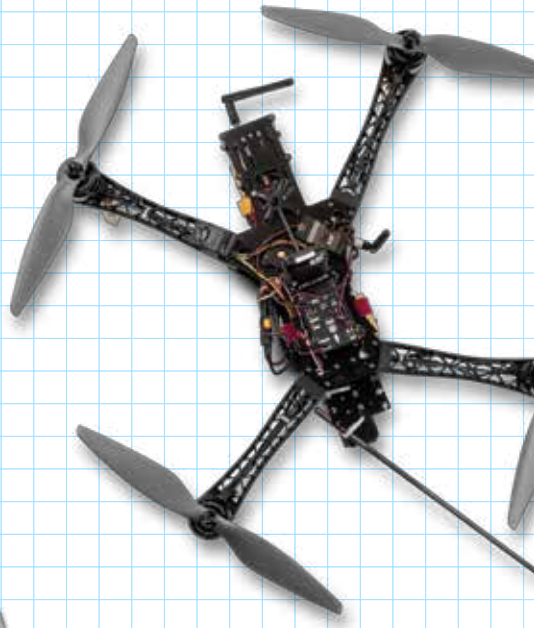

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