

# Common Engineering Programme (AY2020 and earlier)

## OVERVIEW



If you're fascinated by the world of engineering but unsure of which discipline to pursue, our common engineering programme is the best fit for you. Offering the flexibility of eight courses to choose from, this programme will allow you to discover your strengths and interests as you pursue common engineering modules linked to your future course of study.

At the end of your first year, you will be ready to enrol in one of the following diplomas:

- Aerospace Electronics (T50)
- Aerospace Engineering (T51)
- Biomedical Engineering (T38)
- Business Process & Systems Engineering (T43)
- Clean Energy (T52)
- Computer Engineering (T13)
- Electronics (T65)
- Mechatronics (T66)

## Your Journey

# Year 1

You will receive a firm foundation in basic engineering concepts, through lab work, tutorial sessions, educational visits, and hands-on learning opportunities, which will allow you to find out your strengths and interests, before you choose, and are streamed into, one of the eight diploma courses.

# Year 2

You will join the diploma course and study the subjects which are related to that respective field of study, allowing you to specialise in that domain.

# Year 3

In your respective course, you will get the chance to apply your knowledge and skill-sets during your internship with a company in the industry. You will also gain hands-on experience and hone your problem-solving skills when you embark on your Major Project.

## ENTRY REQUIREMENTS

### Minimum Entry Requirements

To be eligible for consideration for admission, applicants must obtain 26 points or better for the net ELR2B2 aggregate score (i.e. English Language, 2 relevant subjects and best 2 other subjects, including CCA Bonus Points) and meet the minimum entry requirements of this course. CCA cannot be used to meet the minimum entry requirements.

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

**Note:** Any special health requirements for a specific diploma course will also apply if you choose to branch into that course

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

^ List of acceptable subjects: Biology, Biotechnology, Chemistry, Combined Science, Computing/Computer Studies, Design & Technology, Electronics/Fundamentals of Electronics, Physics/Engineering Science, Science (Chemistry, Biology), Science (Physics, Biology), Science (Physics, Chemistry)/Physical Science.

See also the minimum entry requirements for:

- International Students

# Common Engineering Programme (AY2020 and earlier)

## COURSE STRUCTURE

### TP Fundamentals Subjects

Subject code	Subject	Level	Credit Units
ECS1005	<p>Communication &amp; Information Literacy</p> <p>In this subject, you will learn how to conduct research for relevant information and validate information sources. You will also learn to recognise and avoid plagiarism, and follow standard citation and referencing guidelines when presenting information. In the course of learning, you will be required to plan, prepare and present information appropriately in written and oral form. You will also be taught to consider the Message, Audience, Purpose and Strategy (MAPS) when writing and delivering oral presentations.</p>	1	2
ECS1006	<p>Workplace Communication</p> <p>In this subject, you will be taught how to conduct effective meetings while applying team communication strategies and the skills for documenting meeting notes. You will be required to write clear emails, using the appropriate format, language, tone and style for an audience. You will also be taught to communicate appropriately in and for an organisation when using various platforms. In all aspects, the principles of applying Message, Audience, Purpose and Strategy (MAPS) will be covered.</p>	1	2
ECS1007	<p>Persuasive Communication</p> <p>In this subject, you will be taught how to use persuasive language in written documents. You will be required to use information to your advantage to verbally communicate and convince an audience about your idea, product or service. Skills such as persuasive vocabulary, language features, graphical illustrations, tone and style would also be covered. The Message, Audience, Purpose and Strategy (MAPS) will also be applied when engaging in verbal and written communication.</p>	1	2
GCC1001	<p>Current Issues &amp; Critical Thinking</p> <p>This subject presents you with a panoramic view of current local and global issues, which may have long term implications for Singapore. You will learn to apply critical thinking tools to examine current issues, support your views with relevant research and up-to-date data, articulate an informed opinion and mature as civic-minded individuals.</p>	1	2

EIN1001	<p><b>Innovation &amp; Entrepreneurship</b></p> <p>The Innovation &amp; Entrepreneurship subject is designed for learners from all disciplines to embrace innovation in either their specialised fields or beyond. You will first learn the Design Thinking framework, where you will develop problem statements and ideate solutions. Next, you will discover the tools for prototyping and innovation, such as 3D printing and laser cutting, at TP's Makerspace+ facility. Finally, you will acquire commercial awareness through the LEAN Startup framework of idea crystallisation, prototype building, customer testing and validation, refinement of business model canvas, and crowdfunding or crowdsourcing avenues.</p>	1	2
LEA1011	<p><b>Leadership: Essential Attributes &amp; Practice 1</b></p> <p>LEAP 1, 2 and 3 are three fundamental subjects that seek to cultivate in you, the attitude, skills and knowledge for the development of your leadership competencies. This character-based leadership programme enables you to develop your life-skills through establishing personal core values, which will become the foundation for your leadership credibility and influence.</p>	1	1
LEA1012	<p><b>Leadership: Essential Attributes &amp; Practice 2</b></p> <p>LEAP 1, 2 and 3 are three fundamental subjects that seek to cultivate in you, the attitude, skills and knowledge for the development of your leadership competencies. This character-based leadership programme enables you to develop your life-skills through establishing personal core values, which will become the foundation for your leadership credibility and influence.</p>	1	1
LEA1013	<p><b>Leadership: Essential Attributes &amp; Practice 3</b></p> <p>LEAP 1, 2 and 3 are three fundamental subjects that seek to cultivate in you, the attitude, skills and knowledge for the development of your leadership competencies. This character-based leadership programme enables you to develop your life-skills through establishing personal core values, which will become the foundation for your leadership credibility and influence.</p>	1	1
LSW1002	<p><b>Sports &amp; Wellness</b></p> <p>This subject will help you develop both the physical and technical skills in your chosen sports or fitness activities. Through a structured curriculum that facilitates group participation, practice sessions and mini competitions, you will learn to build lifelong skills such as resilience, leadership, communication and teamwork. Physical activity sessions will be supplemented by health-related topics to provide you with a holistic approach to healthy living.</p>	1	2
MCR1001	<p><b>Career Readiness 1</b></p> <p>This Career Readiness programme comprises three core subjects – Personal Management, Career Preparation and Career Management. It seeks to help you understand your career interests, values, personality and skills for career success. It also equips you with the necessary skills for seeking and securing jobs, and to develop professional work ethics.</p>	1	1

MCR1002	<p>Career Readiness 2</p> <p>This Career Readiness programme comprises three core subjects – Personal Management, Career Preparation and Career Management. It seeks to help you understand your career interests, values, personality and skills for career success. It also equips you with the necessary skills for seeking and securing jobs, and to develop professional work ethics.</p>	1	1
MCR1003	<p>Career Readiness 3</p> <p>This Career Readiness programme comprises three core subjects – Personal Management, Career Preparation and Career Management. It seeks to help you understand your career interests, values, personality and skills for career success. It also equips you with the necessary skills for seeking and securing jobs, and to develop professional work ethics.</p>	1	1
EGS1002	<p>Global Studies</p> <p>This subject provides essential skills and knowledge to prepare you for an overseas experience. You will examine the elements of culture and learn the key principles of cross-cultural communication. In addition, you will gain an appreciation and awareness of the political, economic, technological and social landscape to function effectively in a global environment.</p>	1	3
EGS1003	<p>Managing Diversity at Work*</p> <p>This subject explores the concepts of identity, diversity and inclusion at the workplace. It examines the relationship between identity and diversity, the benefits and challenges of diversity and the strategies that promote inclusion and inspire collaboration in a diverse workplace. Examples of the elements of diversity covered in this subject include nationality, generation, ethnicity and gender.</p>	1	3
EGS1004	<p>Global Citizenship &amp; Community Development*</p> <p>Students will examine the meaning and responsibilities of being a Global Citizen, in order to contribute towards a more equitable and sustainable world.? In addition, students will learn how sustainable solutions can support community development, and, execute and critique a community action plan that addresses the needs of a specific community/cause.</p>	1	3
EGS1005	<p>Expressions of Culture*</p> <p>This subject provides a platform for an understanding of culture and heritage through modes of expression. Students will be introduced to global and local cultures via everyday objects, places and human behaviour seen through time and space. Students will explore issues and challenges in culture and heritage sustainability in community, national and global contexts.</p>	1	3
TGL1001	<p>Guided Learning</p> <p>The subject introduces students to the concepts and process of self-directed learning in a chosen area of inquiry. The process focusses on four stages: planning, performing, monitoring and reflecting. Students get to plan their individual learning project, refine and execute the learning plan, as well as monitor and reflect on their learning progress and project. The learning will be captured and showcased through a curated portfolio. The self-directed learning project will broaden and/or deepen a student’s knowledge and skills.</p>	1	3

ESI3001	<p>Student Internship Programme</p> <p>The on-the-job training nature of the programme allows you to gain some industrial experience. Through this programme, you will be exposed to the work environment so that you can better appreciate and understand the problems and issues at the work place. The content and scope of learning varies from organisation to organisation. However, it is envisaged that after the programme, you would have, in general, developed your communication and interpersonal skills as well as the right work ethics, and also become more mature, confident and independent, and have a more realistic expectation of what a working environment is like.</p>	3	12
---------	---	---	----

\* Students must choose to take either one of these three subjects or TGL1001 Guided Learning.

## Core Subjects

In Year 1, Semester 1, all students will go through a common curriculum, which comprises the following subjects:

Subject code	Subject	Level	Credit Units
EEE1001	<p>Circuit Analysis</p> <p>This subject provides a good foundation in DC and AC network analysis. You will learn the basic principles of electric circuitry and how to apply circuit theorems to analyse DC and AC networks.</p>	1	6
EEE1003	<p>Digital Fundamentals 1</p> <p>This subject provides basic knowledge of digital electronics and circuits. Topics include number systems, operations and codes, logic gates, Boolean algebra and logic simplification, combinational logic, functional blocks, latches and flip-flops.</p>	1	5
EMA1003	<p>Engineering Mathematics 1</p> <p>This subject introduces the concepts in algebra and trigonometry that are fundamental to an engineering course. Topics include expressions and equations, functions and graphs, trigonometry, complex numbers, matrices and vectors. These also constitute pre-requisite knowledge for a course in Calculus.</p>	1	4
ESE1006	<p>Computer Programming for Problem Solving</p> <p>This subject covers the process of decomposing a problem into a sequence of smaller abstractions. The abstractions are implemented in software in a structured top-down approach. Software implementation includes the process of designing, writing, testing, and debugging program code.</p>	1	4

In Year 1, Semester 2, students who successfully stream into the Diploma in Aerospace Electronics, Diploma in Aerospace Engineering or Diploma in Business Process & Systems Engineering will begin following the respective curriculum of these two diploma courses.

The remaining students who have not streamed yet, will continue with the following curriculum for Year 1, Semester 2:

Subject code	Subject	Level	Credit Units
--------------	---------	-------	--------------

EED1001	<p>Electronic Prototyping</p> <p>This subject introduces you to the use of hand tools and standard laboratory equipment for the construction and testing of electronic prototypes. You will also learn to identify basic electronic components for project work and how to use them to build electronic devices.</p>	1	3
EEE1002	<p>Electronic Devices &amp; Circuits</p> <p>This subject covers the theory and practical knowledge of electronic devices such as diodes, bipolar junction transistors, field effect transistors and their applications. It also focuses on the fundamentals of operational amplifiers and their applications, and the rudiments of circuit troubleshooting and testing.</p>	1	6
EEE1004	<p>Digital Fundamentals 2</p> <p>This subject builds upon the fundamentals of digital electronics acquired in Digital Fundamentals 1. It introduces the digital concepts of the various building blocks in a computer's digital system. You will acquire the theoretical and practical knowledge of registers, counters, memory devices, and conversions between digital and analogue signals and integrated circuit technologies. Digital troubleshooting techniques are also explored in the laboratory work.</p>	1	5
EMA1002	<p>Engineering Mathematics 2</p> <p>This subject introduces the basic concepts of calculus and statistical method to test a hypothesis. Basic concepts in calculus include limits, derivatives and integrals. Applications of the derivative and integrals in engineering will be discussed. Basic statistical method in hypothesis testing includes normal distribution, confidence interval of population mean and procedure to test hypothesis for a claim made about a population mean.</p>	1	4
ESC1004	<p>Engineering Physics</p> <p>This subject covers a spectrum of fundamental physics laws and concepts applicable to the scope of engineering physics. It covers a few core areas including Mechanics, Energy, Thermal Physics, Electromagnetism, Waves &amp; Optics and Materials. This subject provides a foundation for a further in depth study of the various engineering disciplines.</p>	1	3

The remaining students will stream into their respective diploma courses from Year 2, Semester 1, onwards and follow the curriculum of their respective diplomas. (Please refer to the respective diploma's website.)

## Graduation Requirements

All students who enrol through this common programme will graduate with the same diploma as those who had joined a particular diploma right from the start. They will be subject to the graduation requirements of the respective diplomas into which they have been streamed.

Please refer to the respective diploma websites for more information:

- Diploma in Aerospace Electronics
- Diploma in Aerospace Engineering
- Diploma in Biomedical Engineering
- Diploma in Business Process & Systems Engineering
- Diploma in Clean Energy
- Diploma in Computer Engineering

- Diploma in Electronics
- Diploma in Mechatronics