DIPLOMA IN AEROSPACE ELECTRONICS (T50)

Course Overview

This course prepares you for a rewarding career in Singapore's resilient aerospace industry. A holistic training programme coupled with practical modules offered by the world-renowned Lufthansa Technical Training will see you pick up key skills in aircraft electrical, communication, navigation and flight control systems.

With TP being the only polytechnic to be certified by the Civil Aviation Authority of Singapore as a SAR-147 Approved Maintenance Training Organisation, you can rest assured that your diploma will take you places. Not only will it be well recognised by employers, it could also potentially reduce the duration of your Aircraft Maintenance Licence (AML) apprenticeship by up to 10 months!

To download a copy of our 4-page course brochure, click here.

Watch Video

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.

Subject	Grade
English Language (EL1)*	1-7
Mathematics (E or A)	1-6
Any one of the listed subjects^	1-6

Any two other subjects, excluding CCA	-
2021 Planned Intake	**100**
Net ELR2B2 aggregate range (2021 JAE)	**6 - 26**

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

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

^ 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:

- ITE Certificate Holders
- International Students

What You'll Learn

YEAR 1

Begin your journey by building a firm foundation in basic engineering concepts through theory and hands-on learning opportunities. You will also gain knowledge on avionic systems and the intelligence of an aircraft, through authentic lessons.

TP Fundamentals (TPFun) Subjects —

Subject Code	Subject	Credit Units
ECS1005	**Communication & Information Literacy** 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 **M**essage, **A**udience, **P**urpose and **S**trategy (MAPS) when writing and delivering oral presentations.	**2**
ECS1007	**Persuasive Communication** 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 **M**essage, **A**udience, **P**urpose and **S**trategy (MAPS) will also be applied when engaging in verbal and written communication.	**2**

	EGS1002	**Global Studies** 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.	**3**	
	EIN1001	**Innovation & Entrepreneurship** The Innovation & 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.	**2**	
	GCC1001	**Current Issues & Critical Thinking** 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.	**2**	
	LEA1011	**Leadership: Essential Attributes & Practice 1** 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.	**1**	
	LSW1002	**Sports & Wellness** 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.	**2**	
	MCR1001	**Career Readiness 1** 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.	**1**	

Core Subjects

Subject Code	Subject	Credit Units
EAE1006	**Avionic Systems** This subject gives a broad overview of aircraft avionics and architecture at the system level, and provides a context for follow-on training. The subject introduces students to the key avionics deployed on-board an air transport aircraft, including the crew information systems, the safety and surveillance systems, the flight and engine control systems, the navigation systems as well as the communications and information systems. The aim of this subject is to equip students with the knowledge to have a good appreciation of the integrated avionic systems onboard an aircraft.	**4**
EEE1001	**Circuit Analysis** This subject provides a good foundation in DC and AC network analysis. You will learn the basic principles of electric circuitry and how to apply circuit theorems to analyse DC and AC networks.	**6**
ESE1006	**Computer Programming for Problem Solving** This subject covers the process of decomposing a problem into a sequence of smaller abstractions. The abstractions are implemented in software in a structured top-down approach. Software implementation includes the process of designing, writing, testing, and debugging program code.	**4**
EEE1003	**Digital Fundamentals 1** This subject provides basic knowledge of digital electronics and circuits. Topics include number systems, operations and codes, logic gates, Boolean algebra and logic simplification, combinational logic, functional blocks, latches and flip-flops.	**5**
EEE1004	**Digital Fundamentals 2** This subject builds upon the fundamentals of digital electronics acquired in Digital Fundamentals 1. It introduces the digital concepts of the various building blocks in a computer's digital system. You will acquire the theoretical and practical knowledge of registers, counters, memory devices, and conversions between digital and analogue signals and integrated circuit technologies. Digital troubleshooting techniques are also explored in the laboratory work.	**5**
EEE1002	**Electronic Devices & Circuits** This subject covers the theory and practical knowledge of electronic devices such as diodes, bipolar junction transistors, field effect transistors and their applications. It also focuses on the fundamentals of operational amplifiers and their applications, and the rudiments of circuit troubleshooting and testing.	**6**

	EMA1003	**Engineering Mathematics 1** 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.	**4**	
	EMA1002	**Engineering Mathematics 2** 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.	**4**	
	ESC1004	**Engineering Physics** This subject covers a spectrum of fundamental physics laws and concepts applicable to the scope of engineering physics. It covers a few core areas including Mechanics, Energy, Thermal Physics, Electromagnetism, Waves & Optics and Materials. This subject provides a foundation for a further in depth study of the various engineering disciplines.	**3**	

YEAR 2

You will consolidate your foundation in engineering concepts by relating to actual applications in the aerospace industry. You will also acquire aircraft maintenance skills through the Lufthansa Technical Training course.

TP Fundamentals (TPFun) Subjects

	Subject Code	Subject	Credit Units	
	ECS1006	**Workplace Communication** 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 **M**essage, **A**udience, **P**urpose and **S**trategy (MAPS) will be covered.	**2**	
	EGS1003	**Managing Diversity at Work*** 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. A one week residential stay is mandatory for this subject.	**3**	

	EGS1004	**Global Citizenship & Community Development***	**3**	
		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.		
	EGS1005	**Expressions of Culture***	**3**	
		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.		
	LEA1012	**Leadership: Essential Attributes & Practice 2**	**1**	
		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.		
	MCR1002	**Career Readiness 2**	**1**	
		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.		
	TGL1001	**Guided Learning**	**3**	
		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.		

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

Core Subjects

Subject Code	Subject	Credit Units
EAE3020	**Aerospace Maintenance Practices** The subject provides fundamental knowledge and understanding of aircraft maintenance practices as well as materials and hardware for *ab initio* engineers studying for their Civil Aviation Authority of Singapore (CAAS), Singapore Airworthiness Requirements (SAR-66) basic knowledge examination paper for the subject module Materials and Hardware (M06) and Maintenance Practices (M07) leading to the aircraft maintenance licence for category B2 maintenance engineers. This subject covers safety precautions, work practices in an aircraft maintenance environment, mechanical and electrical tools, generic aircraft systems and inspection techniques, ferrous, non-ferrous and composites materials, types of corrosion and their identification, bolts and rivets fastener, piping, control cables and also the electrical components of the aircraft systems.	**16**
EAE1002	**Aircraft Electrical Fundamentals** This subject provides you with broad-based knowledge on electrical theories, components and devices. It also covers electrical machines. In addition, you will be equipped with the knowledge that is expected under the Singapore Airworthiness Requirements (SAR-66) standard, so that you will be competent in getting your aircraft maintenance certification later on.	**4**
EAE2003	**Aircraft Electronics and Servomechanisms** This subject provides the students with the broad-based knowledge in the theory and operation of semiconductor diodes, printed circuit boards, transistors, integrated circuits and feedback control systems. Students are also trained to identify typical synchro issues encountered in servomechanisms. In addition, students will be equipped with the required knowledge in SAR-66 so that they can be competent to get certified in aircraft maintenance. The aim of this subject is to equip students with the fundamentals in the study of semiconductor devices and servomechanisms in modern transport aircrafts as required by the Singapore Airworthiness Requirements (SAR-66) M4 of the Civil Aviation Authority of Singapore.	**4**
ESE1008	**Data Visualisation & Analytics** This subject covers the data analytics lifecycle, including gathering, cleaning, processing and visualising of data. Exploratory data analysis methods, descriptive and predictive analytics, and the presentation of insights, will also be covered.	**3**

EMA2003	**Engineering Mathematics 3** This subject introduces Ordinary Differential Equations (ODE). In particular, it focuses on the formulation of engineering problems into first and second order differential equations. Some techniques in solving ODE and the applications of ODE will be discussed, including the use of Laplace Transforms and the calculation of Fourier series.	**4**	
EAE1004	**Fundamentals of Aeronautical Science** This subject gives a broad overview of the basic concepts involved in aeronautical science. Beginning with units for different quantities, the subject covers mechanical forces, principles of moments, stress and strain, properties of solids, fluids and gases, simple harmonic motion, momentum and energy, gyroscopic principles, viscosity and compressibility, heat capacity and heat transfer, laws of thermodynamics, latent heat, principles of light, lenses and mirrors and fiber optics. Transverse and longitudinal waves, intensity and pitch of sound, vibrating strings and pipes are also included. The depth of coverage will adhere to the requirement of SAR-66(M2 - Physics). The aims of this subject are to equip students with the knowledge and skills to: • carry out simple calculations on different aspects of aircraft systems • interpret the specifications on different aircraft subsystems • pass the M2 examination	**5**	

YEAR 3

You will entrench your knowledge in aerospace engineering, especially in the field of avionic systems. You will also intern in an aviation/aerospace company where you get the chance to put your knowledge into practice and gain work experience.

TP Fundamentals (TPFun) Subjects

Subject Code	Subject	Credit Units	
ESI3001	**Student Internship Programme** This structured programme is designed to link your learning with the real work environment. You will be placed in organisation(s) with opportunities to apply the concepts and skills acquired in the course of your study. Besides reinforcing technical concepts and mastering of skills in areas that you have been trained, the practical training will enable you to build important skills such as problem-solving, communication, teamwork, and to cultivate good attitude and a strong work ethic.	**12**	

LEA1013	**Leadership: Essential Attributes & Practice 3**	1	
	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.		
MCR1003	**Career Readiness 3**	1	
	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.		

Core Subjects

Subject Code	Subject	Credit Units
EAE3018	**Aircraft Digital Systems**	5
	This subject gives a general knowledge of the theoretical and practical aspects of aircraft digital fundamentals. It covers study in the area of electronic instrument systems, logic circuits, fibre optics, electronic displays, electronic sensitive devices, electromagnetic environment and digital aircraft systems as required by Singapore Airworthiness Requirements (SAR-66) of the Civil Aviation Authority of Singapore. The aims of this subject are to equip students with the knowledge and skills to: • Identify the layout of electronic/digital aircraft systems in modern wide body transport aircraft. • Understand the digital fundamentals of aircraft electronic instrument systems as required by the SAR-66 Module 5 of the Civil Aviation Authority of Singapore.	
EAE2002	**Aviation Legislation & Human Factors**	4
	The subject provides basic knowledge and understanding of aviation legislation and human factors for ab initio engineers studying for their Singapore Airworthiness Requirements (SAR-66) aircraft maintenance licences. Knowledge of this subj has a significant impact on the safety standards expected of an aircraft maintenance engineer.	

	EAE3009	**Basic Aerodynamics** This subject introduces the principles of aerodynamics and flight controls. It is designed to give a good balance between theoretical knowledge with applications using classroom lessons, wind tunnel and computational fluid dynamics experiments. The syllabus includes all topics in the Singapore Airworthiness Requirements (SAR-66) Module M08 on Basic Aerodynamics".	**3**	
	EMC3006	**Microcontroller Applications** This subject provides you with working knowledge on microcontroller architecture, the features and characteristics of the internal peripherals in the microcontroller, such as interrupts, Timer and PWM, in order to design and implement an embedded system that involves hardware and software interfacing. The subject also covers the features of evolving microcontrollers that support Internet of Things (IoT) applications.	**5**	

Special Electives

Students can opt to take Special Electives when offered. These optional subjects aim to stretch the students' potential to enable them meet their aspirations.

Special Electives

	Subject Code	Subject	Credit Units	
	EED3009	**Special Project 1** The focus of this subject is on the application of students' existing domain knowledge to develop a deliverable. The subject will introduce new skills and knowledge specific to the project, as and when required.	**2**	
	EED3010	**Special Project 2** This subject provides opportunities for students to apply the acquired knowledge and skills, along with their fundamental and in-depth knowledge from different subjects to designing, developing, and implementing a well-engineered project solution.	**2**	
	EED3011	**Higher Engineering Skills 1** Higher Engineering Skills 1 and 2 aim to impart some special design and hands-on skills that allow you to acquire knowledge and skills that are not normally incorporated into a diploma programme. These Special Elective subjects will equip you with the skills and knowledge to participate in competitions and enable you to tackle real challenges.	**2**	

	EED3012	**Higher Engineering Skills 2** Higher Engineering Skills 1 and 2 aim to impart some special design and hands-on skills that allow you to acquire knowledge and skills that are not normally incorporated into a diploma programme. These Special Elective subjects will equip you with the skills and knowledge to participate in competitions and enable you to tackle real challenges.	**2**	
	EMA3001	**Higher Engineering Mathematics** The subject introduces mathematical concepts and techniques used in advanced engineering courses. You will learn topics in calculus such as limits and continuity, infinite series, improper integrals, multiple integrals, higher order differential equations, 2D and 3D analytic geometry, and partial differentiation.	**4**	

GRADUATION REQUIREMENTS

Cumulative Grade Point Average	min 1.0
TP Fundamentals Subjects	36 credit units
Diploma Core Subjects	94 credit units
Total Credit Units Completed	min 130 credit units