



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!

You can also take our new "Unmanned Aircraft Operations" elective subject and learn to develop unmanned aerial vehicle prototypes (such as drones!) by using emerging technologies in embedded controllers, 3D printing and software application programming.

To download a copy of our 4-page course brochure, click [here](#).



LEARN FROM EXPERTS

Quality training with Lufthansa Technical Training (a SAR-147 AMTO) which will shorten your subsequent professional Aircraft Maintenance Licence (AML) apprenticeship.



TAKE FLIGHT

Opportunity for one-semester attachment to Singapore Youth Flying Club (SYFC) for Private Pilot License (PPL).



DIVE INTO AVIONICS

Gain in-depth insight into avionic systems through air accidents and better understand future aviation technologies.

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	-
2022 Planned Intake	75
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.

What You'll Learn

YEAR 1

YEAR 2

YEAR 3

TPFUN

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.

Core Subjects

Subject Code	Subject	Credit Units	
EAE1006	Avionic Systems <p>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.</p> <p>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.</p>	4	^
EEE1001	Circuit Analysis <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>	6	^
ESE1006	Computer Programming for Problem Solving <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</p>	4	^

	approach. Software implementation includes the process of designing, writing, testing, and debugging program code.		
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 1

YEAR 2

YEAR 3

TPFUN

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.

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 <i>ab initio</i> 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 <p>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.</p>	4	^
EAE2003	Aircraft Electronics and Servomechanisms <p>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.</p> <p>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.</p>	4	^
ESE1008	Data Visualisation & Analytics <p>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.</p>	3	^
EMA2003	Engineering Mathematics 3 <p>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.</p>	4	^
EAE1004	Fundamentals of Aeronautical Science <p>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).</p> <p>The aims of this subject are to equip students with the knowledge and skills to:</p> <ul style="list-style-type: none"> • carry out simple calculations on different aspects of aircraft systems • interpret the specifications on different aircraft subsystems • pass the M2 examination 	5	^

YEAR 1

YEAR 2

YEAR 3

TPFUN

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.

Core Subjects

Subject Code	Subject	Credit Units	
EAE3018	Aircraft Digital Systems <p>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.</p> <p>The aims of this subject are to equip students with the knowledge and skills to:</p> <ul style="list-style-type: none"> • 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. 	4	^

EAE2002	Aviation Legislation & Human Factors 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 subject has a significant impact on the safety standards expected of an aircraft maintenance engineer.	4	^
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	^

Cluster Elective Subjects

Students are to choose one of these elective clusters

IoT & Automation Elective Cluster			
Subject Code	Subject	Credit Units	
EMC2006	Internet of Things Project This subject equips you with the knowledge and skills required for implementing the new paradigm in which things interact with things, people and the Internet or information systems. The subject provides knowledge, skills and design approaches in using embedded systems, sensors, actuators and appropriate data communication technologies such as sensor networks, edge and cloud computing to achieve such interaction. A systems engineering approach will be adopted, under which you will review key technologies from prior learning for the different levels of the IoT (Internet of Things) stack and figure out how these different levels could be integrated to form complete IoT systems.	4	^
ESC3013	Intelligent Automation This subject will provide you with basic knowledge and hands-on digital transformation skills on rapid multi-experience application development and integration of users, tasks and systems towards enhancing productivity, human augmentation and automatic data-driven decision-making. It will cover techniques on how to leverage on data from information systems and Internet of Things (IoT) devices for agile response and productivity. This subject will enable you to automate data-driven decision making through integration of advanced analytics and learning models to applications.	3	^

Aerospace Operations Elective Cluster			
Subject Code	Subject	Credit Units	
EAE2004	Unmanned Aircraft Operations This subject will introduce the flight theory and applications of unmanned aircraft along with the local regulatory requirements for its operations. You will have opportunities to develop unmanned aerial vehicle prototypes using emerging technologies in embedded controllers, 3D printing and software application programming.	3	^
EAE3014	Lean Processes This subject introduces the principles of lean tools and techniques to eliminate waste, manage inventory and improve product flow in a manufacturing organisation. Key concepts such as 6S, just-in-time (JIT), and process management will prepare you to work effectively in a manufacturing environment.	3	^

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	<p>Special Project 1</p> <p>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.</p>	2
EED3010	<p>Special Project 2</p> <p>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.</p>	2
EED3011	<p>Higher Engineering Skills 1</p> <p>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.</p>	2
EED3012	<p>Higher Engineering Skills 2</p> <p>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.</p>	2
EMA3001	<p>Higher Engineering Mathematics</p> <p>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.</p>	4

YEAR 1

YEAR 2

YEAR 3

TPFUN

You will also undergo TP Fundamentals (TPFun) – a set of subjects that equips you with the crucial life skills you need to navigate the modern world as an agile and forward-thinking individual, and team player.

TP Fundamentals (TPFun) Subjects

Subject Code	Subject	Credit Units
GTP1301	<p>Current Issues & Critical Thinking</p> <p>This subject covers current issues, including diverse local and global concerns, that will impact lives and may have critical implications for Singapore. There will be opportunities to build competence through self-directed learning, communicate and collaborate in active discussions and objectively analyse issues using digital and information literacy skills and critical thinking scaffolds.</p> <p>This subject aims to provide students with the knowledge and skills to:</p> <ul style="list-style-type: none"> • apply critical thinking tools to examine current issues. • effectively search for relevant information from a variety of sources. • evaluate research information. • cite sources to support their views. • articulate an informed opinion about current issues. 	3
ETX1001	<p>Effective Communication</p> <p>This subject introduces the fundamentals of effective communication. It also covers how to communicate with and convince an audience through writing and speaking tasks. The skills in this subject will include the application of strategies for communication, appropriate vocabulary, language features, visual aids, tone and style. The Message, Audience, Purpose and Strategy (MAPS) framework will also be applied when planning and engaging in written and verbal communication. There will be opportunities to communicate and collaborate through active learning activities, apply digital and information literacy skills and build competence through self-directed learning.</p>	3

This subject aims to equip students with the knowledge and skills to:

- apply the factors that influence effective communication.
- structure a compelling point of view through a writing task.
- express their ideas convincingly to an audience in an oral presentation.

ETX1002

Professional Communication

3



This subject covers professional communication skills for the workplace and employability skills in the areas of career preparation. It covers communication and interpersonal skills, including effective virtual communication etiquette, and conducting oneself professionally in the workplace. In addition, essential career preparation skills such as resume writing and interview skills, needed to seek and secure work would be included. The **Message, Audience, Purpose** and **Strategy (MAPS)** framework would also be applied when engaging in written and verbal communication. There will be opportunities to communicate and collaborate through active learning activities, apply digital and information literacy skills and build competence through self-directed learning.

The subject aims to equip students with the knowledge and skills to:

- communicate effectively in the workplace using principles of effective written communication and interpersonal skills.
- apply effective job search and interview skills in their career preparation.

GTP1101

Leadership Fundamentals

2



This subject focuses on self-leadership based on the values of integrity, respect, and responsibility. Increasing awareness of self and others will lay the foundations for personal and relationship effectiveness. Consequential thinking, clear articulation of personal values and visions, emphatic listening, and collaboration in serving others are some of the essential skills covered in this leadership journey. There will be opportunities to build and to apply the concepts of being a values-centred leader.

The aim of this subject is to guide students to:

- design a personal growth plan based on strengths, values and purpose.
- apply the attributes of logical and emotional intelligence to improve team effectiveness.
- identify the key messages of respect in relationships.
- apply the principles of effective personal financial management.

GTP1102

Leadership in Action

1



This subject focuses on Service Learning as an experiential platform to apply the tenets of Self and Team Leadership. Service Learning will be the capstone project for this subject, which will require an analysis of the diverse needs of the community, collaboration with community partners and demonstration of learning, including key elements of empathy. There will be opportunities to build and to apply the concepts of being a values-centred leader.

This subject aims to equip students with the knowledge and skills to:

- plan and carry out a project to demonstrate empathy towards people in a diverse community.
- apply diploma core knowledge and skills through the Service Learning platform to address community needs.
- reflect on the Service Learning experience when working in teams and with community partners.

GTP1201

Career Readiness CARE1

1



This subject focuses on personal management skills. It develops an understanding of one's career interests, values, personality and skills for career success. It covers the necessary knowledge, skills and attitudes needed to succeed in the workplace and achieve professional goals. There will be exposure to apply digital and information literacy skills, build competence through self-directed learning methods and acquire the skills of being a lifelong learner.

This subject aims to equip students with the knowledge and skills to:

- analyse personal characteristics that can contribute positively to achieving personal, educational and career goals.
- make career decisions that are aligned with their interests, skills and values.







GTP1202




Career Readiness CARE2

1



This subject focuses on career management skills. It covers the importance of workplace readiness skills to adapt and respond to the changing job market environment. Career ownership and continuous learning for lifelong employability will be emphasised. There will be exposure to apply digital and information literacy skills, build competence through self-directed learning, and acquire the skills of being a lifelong learner.

	<p>This subject aims to equip students with the knowledge and skills to:</p> <ul style="list-style-type: none"> • analyse personal characteristics that can contribute positively to achieving personal, educational and career goals. • make career decisions that are aligned with their interests, skills and values. 		
GTP1202	<p>Career Readiness CARE2</p> <p>This subject focuses on career management skills. It covers the importance of workplace readiness skills to adapt and respond to the changing job market environment. Career ownership and continuous learning for lifelong employability will be emphasised. There will be exposure to apply digital and information literacy skills, build competence through self-directed learning, and acquire the skills of being a lifelong learner.</p> <p>This subject aims to equip students with the knowledge and skills to:</p> <ul style="list-style-type: none"> • identify their work profiles to help them in their career choices in a changing job market environment. • take career ownership for continuous learning and lifelong employability. 	1	
LSW1002	<p>Sports & Wellness</p> <p>The subject enables students to build a good foundation for healthy living. Students will have the opportunity to participate in hands-on practical sessions where they will experience and develop both physical and technical skills in their chosen sports or fitness activities. Through a structured curriculum that facilitates group participation, practice sessions and mini competitions, students will be able to build lifelong skills such as resilience, leadership, communication and teamwork. Physical activity sessions will also be supplemented by health-related topics that span the dimensions of health, such as diet, nutrition, stress and weight management, to provide students with a holistic approach to healthy living. This subject also prepares students to be self-directed and accountable for lifelong learning for good health.</p>	2	
EIN1001	<p>Innovation & Entrepreneurship</p> <p>The subject is designed for learners from all disciplines to embrace innovation in either their specialised field or beyond. Learners will be taught to apply the Design Thinking framework to develop problem statements, ideate and identify feasible solutions. Learners will be exposed to several tools for prototyping. In addition, commercial awareness will be imbued in learners through various innovation and entrepreneurship concepts or tools. This subject also prepares students to be self-directed lifelong learners who are digital and information literate. It nurtures communicative and collaborative citizens who can use objective analysis in problem-solving.</p>	2	
EGS1002	<p>Global Studies</p> <p>This subject provides essential skills and knowledge to prepare students for an overseas experience. They will examine the elements of culture and learn the key principles of cross-cultural communication. In addition, they will gain an appreciation and awareness of the political, economic, technological and social landscape to function effectively in a global environment. The subject prepares students to be responsible citizens and leaders who can contribute to the global community through effective communication and collaboration.</p>	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. The subject prepares students to be responsible citizens and leaders who can contribute to the global community through effective communication and collaboration.</p>	3	
EGS1004	<p>Global Citizenship & 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. The subject prepares students to be responsible citizens and leaders who can contribute to the global community through effective communication and collaboration.</p>	3	

EGS1005	Expressions of Culture* 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. The subject prepares students to be responsible citizens and leaders who can contribute to the global community through effective communication and collaboration.	3	
GTP1302	Guided Learning 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 will enhance their problem solving and digital literacy skills through this subject.	3	
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	

*Students must choose one of these three electives under the 'Global Studies 2' subject, or take 'Guided Learning'

GRADUATION REQUIREMENTS

Cumulative Grade Point Average	min 1.0
TP Fundamentals Subjects	36 credit units
Diploma Core Subjects	88 credit units
Diploma Cluster Elective Subjects	min 6 credit units
Total Credit Units Completed	min 130 credit units