



DIPLOMA IN AEROSPACE ENGINEERING (T51)

Course Overview

Are you the type to look up to the sky every time you hear the roar of an aircraft high above? Do you marvel at how these magnificent machines can overcome gravity and stay airborne? Do you wonder how engineers build aeroplanes, and how some of them can fly so fast that they can break the sound barrier?

Then come to the course that will shed light on these mysteries. From aircraft flight and aircraft design to airframe structure and engine systems to the manufacturing of aircraft systems, and more, you will receive the training you deserve, and become an aerospace engineer the industry needs!

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



FIRST SAR-147 APPROVED AMTO

First Polytechnic approved by the Civil Aviation Authority of Singapore to be a SAR-147 Approved Maintenance Training Organization (AMTO).



LEARN FROM EXPERTS

Quality practical skills training in aircraft maintenance practices with Lufthansa Technical Training (a SAR-147 AMTO).



TAKE FLIGHT

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

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	100
Net ELR2B2 aggregate range (2021 JAE)	5 - 18

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

Our core engineering subjects and some TP fundamental subjects will give you the solid foundation you need and help you grow holistically. These will prepare you well before subsequently embarking on the more rigorous aspects of aerospace training.

Core Subjects

Subject Code	Subject	Credit Units
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
EEE1002	Electronic Devices & Circuits This subject covers the theory and practical knowledge of electronic devices such as diodes,	6

	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.		
EDR1003	Engineering Drawing Engineering drawing is essential for communicating engineering design. This subject will introduce you to the understanding and preparation of two-dimensional mechanical engineering drawings with the use of both manual and Computer Aided Design/ Drafting (CAD) software. CAD modelling is also taught. You will also learn general methods of dimensioning according to international and local standards.	4	^
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	^
EME1002	Statics & Strength of Materials This subject consists of two principal areas: Fundamentals statics and strength of materials. Fundamental statics provides an introduction to the basic concepts in simple statics, while strength of materials introduces the methodology for designing members subjected to various loading conditions.	4	^
EME2009	Thermodynamics This subject equips you with the basic knowledge in thermodynamics, concepts of the temperature scales and measurements, the First Law of Thermodynamics, Ideal Gas Laws, Second Law of Thermodynamics and heat energy calculations using a P-V diagram. The syllabus is based on the guide for relevant topics on thermodynamics listed in the Singapore Airworthiness Requirements (SAR-6) Module 2 "Physics". Knowledge of this subject allows you to understand the mechanisms of heat transfer and how gas turbine engines work.	3	^

YEAR 1

YEAR 2









YEAR 3

TPFUN

You can look forward to more CAAS SAR-66 modules, which enable you to appreciate aerospace engineering and further improve your competency skill sets. You will feel challenged and yet more enriched in your pursuit of more advanced aerospace concepts.

Core Subjects

Subject Code	Subject	Credit Units
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
EAE1008	Aircraft Electronics & Digital Systems	4

	<p>This subject covers the basics of semiconductors, printed circuit boards, servomechanisms, electronic instrument systems, logic circuits, fibre optics, electronic displays, electronic sensitive devices, electromagnetic environment and digital aircraft systems. The depth of coverage will adhere to the requirement of SAR-66 (Category B1) for M4 - Electronic Fundamentals and M5 - Digital Techniques/Electronic Instrument Systems.</p> <p>The aims of this subject are to equip students with the knowledge and skills to:</p> <ul style="list-style-type: none"> • use and work with synchros and resolvers in servomechanisms • identify the layout of electronic/digital aircraft systems in modern wide transport aircraft • understand the electronic fundamental theory in modern board aircraft electronic instrument systems as required by the SAR-66 Module 4 and 5 (Category B1) of the Civil Aviation Authority of Singapore • pass the M4 and M5 (Category B1) examinations 		
EAE2002	<p>Aviation Legislation & Human Factors</p> <p>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.</p>	4	
EAE3009	<p>Basic Aerodynamics</p> <p>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”.</p>	3	
ESE1008	<p>Data Visualisation & Analytics</p> <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	
EME2006	<p>Engineering Materials</p> <p>This subject will equip you with fundamental knowledge and practical skills to evaluate, process and inspect common aircraft materials, thereby building up your capability in detecting and testing surface defects in actual applications. You will be able to develop the knowledge and skills in the designing and selection of materials, as well as in supporting key processes to optimise the performance of aerospace components.</p>	4	
EMA2003	<p>Engineering Mathematics 3</p> <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	
EME2010	<p>Fluid Mechanics</p> <p>This subject provides students with fundamental knowledge in applied mechanics of fluids under incompressible viscous flow condition. It covers fluid properties, fluid statics, fluid in motion, governing equations, viscous flow through duct, minor losses, multiple-pipe system, drag and lift, and compressible flow.</p>	3	
EAE3008	<p>Gas Turbine Engine</p> <p>This subject equips you with knowledge of aircraft propulsion methods, thermodynamic cycles, combustion and thermochemical analysis, reciprocating engines, gas turbine and jet engines, effects of atmospheric variations (temperature, density, pressure altitude) on engine and on engine/aircraft combination, auxiliary systems (such as fuel system, lubrication system, ignition, starting, fire protection, auxiliary power unit), and current developments in propulsion systems. The syllabus is equivalent to the Singapore Airworthiness Requirements (SAR-66) Module M15 on Gas Turbine Engine”.</p>	4	
EME2008	<p>Principles of Dynamics</p> <p>The application of dynamic systems theory can be seen everywhere in our daily lives, from vehicles moving on the road to planes flying in the air. In this subject, you will learn the</p>	5	

fundamental principles of dynamics and apply them to the analyses of bodies in motion. The objective is to present the foundation and applications of dynamics. The main topics covered include Newton's laws of motion, the principle of work and energy, the principle of impulse and momentum, and the motion of projectiles.

YEAR 1

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TPFUN

You will be taught engineering materials, hardware and aircraft maintenance practices during your attachment to the TP-Lufthansa Technical Training Centre. You will also gain invaluable experience as an aerospace professional through your internship in an aerospace engineering company in the industry.

Core Subjects

Subject Code	Subject	Credit Units
EMP3002	<p>Major Project</p> <p>This subject will give you an opportunity to integrate and apply the skills and knowledge gained during your course of study prior to the Major Project (MP). The engineering design thinking process developed through the MP will enable you to frame problems adequately, create more ideas and develop the best solution. The team-based MP also gives you the opportunity to work as an integrated product team so that you are well prepared for project-based careers in the aerospace industry.</p>	8
EAE3020	<p>Aerospace Maintenance Practices</p> <p>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.</p>	16
EAE3015	<p>Aircraft Structures & Composites</p> <p>The subject will provide a firm foundation in airframe structures, design application and testing of composites in aircraft. The focus on stress and strength computational analysis, as well as design philosophies and concepts, will enable you to troubleshoot, analyse and develop possible repair schemes on the airframe structures competently.</p>	4
EAE3022	<p>Engine Maintenance & Workshop Practices</p> <p>This subject will equip you with the knowledge and skills to perform basic maintenance and engine build & strip, as well as carry out inspection and identify suitable repair processes for various gas turbine components. The subject also covers workshop safety and basic workshop practices so that you are able to develop safe practices and work efficiently with the basic hand-skills acquired. This foundation will equip and suitably prepare you for an exciting career in the engine Maintenance, Repair & Overhaul (MRO) sector.</p>	4

Options

Lufthansa Technical Training (LTT) Option

Subject Code	Subject	Credit Units
EAE3020	<p>Aerospace Maintenance Practices</p> <p>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</p>	16

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.

Aerospace System Design (ASD) Option

Subject Code	Subject	Credit Units
EAE3015	<p>Aircraft Structures & Composites</p> <p>The subject will provide a firm foundation in airframe structures, design application and testing of composites in aircraft. The focus on stress and strength computational analysis, as well as design philosophies and concepts, will enable you to troubleshoot, analyse and develop possible repair schemes on the airframe structures competently.</p>	4
EAE3022	<p>Engine Maintenance & Workshop Practices</p> <p>This subject will equip you with the knowledge and skills to perform basic maintenance and engine build & strip, as well as carry out inspection and identify suitable repair processes for various gas turbine components. The subject also covers workshop safety and basic workshop practices so that you are able to develop safe practices and work efficiently with the basic hand-skills acquired. This foundation will equip and suitably prepare you for an exciting career in the engine Maintenance, Repair & Overhaul (MRO) sector.</p>	4
EMP3002	<p>Major Project</p> <p>This subject will give you an opportunity to integrate and apply the skills and knowledge gained during your course of study prior to the Major Project (MP). The engineering design thinking process developed through the MP will enable you to frame problems adequately, create more ideas and develop the best solution. The team-based MP also gives you the opportunity to work as an integrated product team so that you are well prepared for project-based careers in the aerospace industry.</p>	8

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</p>	2

programme. These Special Elective subjects will equip you with the skills and knowledge to participate in competitions and enable you to tackle real challenges.

EMA3001

Higher Engineering Mathematics

4



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.

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

Current Issues & Critical Thinking

3



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.

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

- 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.

ETX1001

Effective Communication

3



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.

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 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: <ul style="list-style-type: none"> • 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. 	2 
GTP1102	Leadership in Action 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: <ul style="list-style-type: none"> • 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. 	1 
GTP1201	Career Readiness CARE1 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: <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. 	1 
GTP1202	Career Readiness CARE2 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. This subject aims to equip students with the knowledge and skills to: <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	Sports & Wellness 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.	2 
EIN1001	Innovation & Entrepreneurship The subject is designed for learners from all disciplines to embrace innovation in either their	2 

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.

EGS1002	Global Studies	3	
<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>			
EGS1003	Managing Diversity at Work*	3	
<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>			
EGS1004	Global Citizenship & Community Development*	3	
<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>			
EGS1005	Expressions of Culture*	3	
<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. The subject prepares students to be responsible citizens and leaders who can contribute to the global community through effective communication and collaboration.</p>			
GTP1302	Guided Learning	3	
<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. Students will enhance their problem solving and digital literacy skills through this subject.</p>			
ESI3001	Student Internship Programme	12	
<p>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.</p>			

*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	97 credit units
Total Credit Units Completed	min 133 credit units