THE HONG KONG POLYTECHNIC UNIVERSITY
香港理工大學

Interdisciplinary Division of Aeronautical and Aviation Engineering

Bachelor of Engineering (Honours)
in
Air Transport Engineering
民航工程學(榮譽)工學士學位

Programme Code: 48401
(Full-time Credit-based)

Definitive Programme Document
(For 2017/18 cohort)

August 2017

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This Definitive Programme Document is applicable for 2017/18 intakes. It is subject to review and changes which the Programme Host can decide to make from time to time. Students will be informed of the changes as and when appropriate.

PART A PROGRAMME SCHEME

1. General Information

1.1 Introduction

Programme Title	Bachelor of Engineering (Honours) in Air Transport Engineering 民航工程學 (榮譽)工學士學位
Host Department	The programme is hosted by the Interdisciplinary Division of Aeronautical and Aviation Engineering (AAE) of Faculty of Engineering, with the support of the following academic departments: • Department of Electrical Engineering • Department of Electronic and Information Engineering • Department of Industrial and Systems Engineering • Department of Mechanical Engineering
Programme Structure	Credit-based
Mode of attendance	Full-time
Duration	Normal : 2 years (4 semesters) Maximum: 4 years (8 semesters)
Final Award	Bachelor of Engineering (Honours) in Air Transport Engineering 民航工程學 (榮譽)工學士學位
Credits required for graduation	(a) Academic credits: **Normally 66*** *exact number of credits depends on the academic background of students (b) Training credits: **4** (c) Work-Integrated Education (WIE) Training Credit: **1**
Implementation Year	The first intake started in September 2014

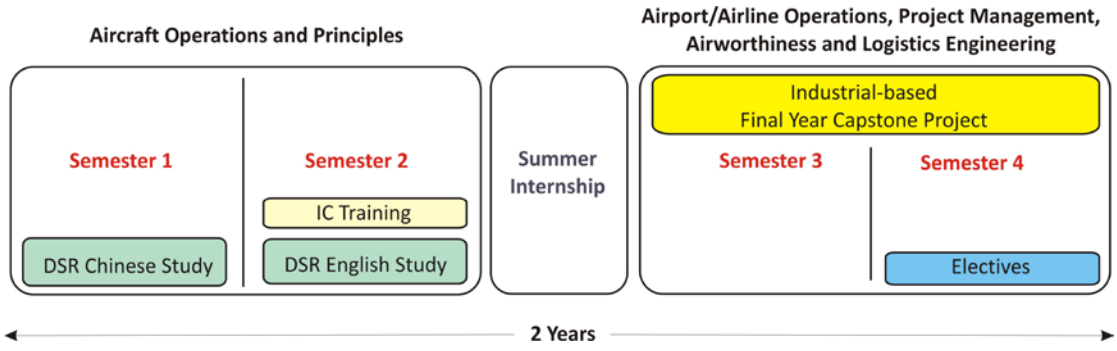
1.2 Characteristics

The programme has the following characteristics:

(a) A specialized programme providing fundamental aeronautical knowledge for students to prepare for licensed or design aircraft engineer certification and aviation operation management.
(b) Some of the subjects are co-taught by PolyU academics and industry professionals to give students first-hand information on the aviation industry.
(c) Summer internships, technical visits and on-site experience sharing may be arranged to enhance students' learning and work experience in the industry.

In this programme, students receive fundamental knowledge of aircraft operations and principles in their first year study prior to participation in the summer internship programme, which may be offered by industrial partners. In the second year, knowledge on airport project management, airworthiness and logistics engineering are delivered to students to provide them a complete picture on the operation of the aviation industry.

Industrial Central (IC) training which aims at providing students with basic hands-on engineering skills and practice through workshop and project training is arranged at the beginning of the second semester. Elective subjects are provided to students to enrich their knowledge in some specialized areas in aviation.



Programme Structure

1.3 Minimum Entrance Requirements

An Associate Degree or a Higher Diploma in a related engineering discipline.

1.4 Student Exchanges

Exchanges to Universities overseas for a semester or an academic year are possible through various exchange schemes organised by the University, Faculty or Division. Credit transfer for students joining exchange programmes will be granted on a case by case basis. Depending on the transferability of credits, students may need to defer graduation after completing the exchange programmes. In order to ensure attaining the pre-requisite knowledge for smooth integration of study in the programme, students will be counselled on subject selection in the visited Universities before they leave for the exchange.

1.5 External Recognition

The programme has been granted provisional accreditation by the Hong Kong Institution of Engineers (HKIE). It will seek professional recognition from the Royal Aeronautical Society (RAeS).

1.6 Tuition Fee

Subject to revision, the tuition fee is currently at HK$42,100 per academic year.

1.7 Summer Term Teaching

Usually, there will be no summer term teaching. Industrial Centre Training or External Training may take place during the summer.

1.8 Daytime and Evening Teaching

Subjects will be offered predominantly during weekdays/Saturdays. Some subjects may be made available only in evenings or Saturdays/Sundays.

2. Rationale, Objectives and Intended Learning Outcomes of the Programme

2.1 Rationale

The aviation industry is an assembly of subsidiary industries embracing aircraft manufacturers, aircraft parts suppliers, aviation services providers, aircraft fuel providers, regulatory authorities, airports, airlines, training organizations, aircraft maintenance organizations and financial institutions.

Hong Kong is the most important regional hub and has one of the busiest airports in the world. The current serious shortage of qualified aviation professionals is a bottleneck for the sustainable growth of our aviation industry. This articulation degree programme aims at nurturing professionals with in-depth practical skills and academic knowledge in air transport engineering to serve the aircraft maintenance engineering, airline and airport operations industries. With the fast-growing aircraft engineering business in China, the programme is also designed as a foundation to train up potential graduates to be capable of taking up postgraduate study and R&D tasks in designing and manufacturing aircraft parts and components.

Graduates of this programme can find employment as aircraft maintenance engineers, aviation operation officers, mechanical engineers, quality assurance specialists, quality and safety officers, line maintenance planners, cargo officers, maintenance controllers, engineers (civil aviation engineering) and graduate engineers.

2.2 Programme Objectives

This programme aims at producing graduates with:

1. In-depth understanding of the operation of air transport engineering including aircraft maintenance and airport operation businesses;

2. Competence to handle different engineering problems practically and academically in the aviation industry;

3. Sufficient knowledge and skills to manage different projects related to the aviation sector effectively and efficiently;

4. Confidence in communication with different parties and stakeholders by the use of state-of-the-art technologies and aviation language (both English and Chinese).

2.3 Relationship of Programme Objectives to University Mission

The University has the following mission:

(a) To nurture graduates who are critical thinkers, effective communicators, innovative problem solvers, lifelong learners and ethical leaders.

(b) To advance knowledge and the frontiers of technology to meet the changing needs of society.

(c) To support a University community in which all members can excel through education and scholarship.

The following table illustrates the relationship between programme objectives and University mission:

Programme Objectives	University Mission		
	(a)	(b)	(c)
1	√	√	√
2	√	√	√
3	√		√
4	√		√

2.4 Institutional Learning Outcomes

The institutional learning outcomes are:

(a) **Competent professional:** Graduates should be able to integrate and apply in practice the fundamental knowledge and skills required for functioning effectively as an entry-level professional.

(b) **Critical thinker:** Graduates should be able to examine and critique the validity of information, arguments, and different viewpoints, and reach a sound judgment on the basis of credible evidence and logical reasoning.

(c) **Effective communicator:** Graduates should be able to comprehend and communicate effectively in English and Chinese, orally and in writing, in professional and daily contexts.

(d) **Innovative problem solver:** Graduates should be able to identify and define problems in professional and daily contexts, and produce creative and workable solutions to the problems.

(e) **Lifelong learner:** Graduates should recognise the need for continual learning and self-development, and be able to plan, manage and improve their own learning in pursuit of self determined development goals.

(f) **Ethical leader:** Graduates should have an understanding of leadership and be prepared to lead a team, and should acknowledge their responsibilities as professionals and citizens to the society and their own nation, and be able to demonstrate ethical reasoning in professional and daily contexts.

2.5 Intended Learning Outcomes of the Programme

On successful completion of the BEng(Hons) in Air Transport Engineering programme, students will be able to:

Professional/academic knowledge and skills (PAK):

(a) identify, formulate and solve problems in the discipline of Air Transport industry by applying knowledge of mathematics, science and engineering;
(b) design and conduct experiments, as well as to analyze and interpret data;
(c) design a system, component or process to meet desired needs;
(d) use the techniques, skills and modern engineering tools, including computational tools necessary for engineering practice;
(e) work professionally in aircraft and aviation systems, including the design and realization of such systems and
(f) understand manufacturing methods for components of aircraft and aviation systems.

Professional outlook and workplace skills (POW):

(a) have sufficient knowledge on contemporary issues and the broad education necessary to understand the impact of engineering solutions in a global and societal context;
(b) function professionally in multidisciplinary teams;
(c) understand professional and ethical responsibility;
(d) communicate effectively and professionally with different parties and stakeholders using appropriate industrial languages and tools;
(e) recognize the need for and engage in life-long learning.

The following table illustrates the relationship between programme outcomes and programme aims:

Programme Outcomes	Programme Aims			
	1	2	3	4
PAK a	√	√	√	
PAK b	√	√	√	
PAK c	√	√	√	
PAK d		√	√	√
PAK e		√	√	√
PAK f	√	√	√	√
POW a	√	√	√	√
POW b		√	√	√
POW c			√	√
POW d		√	√	√
POW e	√	√	√	√

2.6 Relationship of Intended Learning Outcomes of the Programme to Institutional Learning Outcomes

Programme Outcomes	Institutional Learning Outcomes					
	(a)	(b)	(c)	(d)	(e)	(f)
PAK a	√	√		√	√	
PAK b	√	√		√	√	√
PAK c	√	√		√	√	√
PAKd		√	√		√	√
PAK e			√	√		√
PAK f	√	√		√	√	√
POW a	√	√		√		√
POW b		√	√	√	√	√
POW c		√	√	√	√	√
POW d		√	√	√	√	√
POW e					√	

2.7 Relationship of Intended Learning Outcomes of the Programme to the Desired Learning Outcomes of The Hong Kong Institution of Engineers (HKIE)

The Hong Kong Institution of Engineers (HKIE) adopts 12 desired learning outcomes for an engineering degree [referenced to the "Professional Accreditation Handbook (Engineering Degrees)", issued by the HKIE Accreditation Board in February 2013, Pages 10-11]. A comparison between the desired learning outcomes for an engineering degree programme as proposed by the HKIE and the intended learning outcomes of the current programme is given below:

Learning Outcomes	Definition of Desired Learning Outcomes Proposed by HKIE	ILOs of the current programme
1	Ability to apply knowledge of mathematics, science and engineering appropriate to the degree discipline.	PAK: a, b, c, d POW: a
2	Ability to design and conduct experiments, as well as to analyse and interpret data.	PAK: b, c, d POW: a, b
3	Ability to design a system, components or process to meet desired needs within realistic constraints, such as economic, environmental, social, political, ethical, health and safety. Manufacturability and sustainability.	PAK: b, c, d, f POW: a, b, c, e
4	Ability to function on multi-disciplinary team	POW: b
5	Ability to identify, formulate and solve engineering problems	PAK: a, b POW: a
6	Ability to understand professional and ethical responsibility	POW: c
7	Ability to communicate effectively	POW: b, d

Learning Outcomes	Definition of Desired Learning Outcomes Proposed by HKIE	ILOs of the current programme
8	Ability to understand the impact of engineering solutions in a global and societal context, especially the importance of health, safety and environmental considerations to both workers and the general public.	PAK: e, f POW: a, b, c
9	Ability to stay abreast of contemporary issues	PAK: d, e, f POW: a, b, e
10	Ability to recognize the need for, and to engage in life-long learning	POW: e
11	Ability to use the techniques, skills and modern engineering tools necessary for engineering practice appropriate to the degree discipline.	PAK: a, b, c, d POW: a, e
12	Ability to use the computer/IT tools relevant to the discipline along with an understanding of their processes and limitation.	PAK: d, e POW: a

3. Curriculum

3.1 Programme Specified Subjects

Unless specified otherwise, all subjects in the curriculum are of standard credit value carrying 3 credits each. A student is expected to spend about 35 to 45 hours of study (inclusive of class contact and other study effort) to earn a credit. Table 3.1 lists the subjects, their credit values and the category to which they belong (Compulsory or Elective). All subjects shown as compulsory are non-deferrable and must be taken in accordance to the progression pattern. The subjects offered will be updated from time to time according to the needs of society and the profession.

Students are required to complete a minimum of 66 (9 credits for General University Requirements (GUR) and 57 credits for Discipline-Specific Requirements (DSR)) or more academic credits to satisfy the graduation requirements. The exact number of academic credits required will depend on the academic background of the students. The subjects contributing to the 66 academic credits are listed in Table 3.1.

Subject Code	Subject Title	Credit	Pre-requisites (if any)	COM/ ELE
General University Requirements (GUR): 9 Credits				
	Cluster-Area Requirement I (CAR I)	3		COM
	Cluster-Area Requirement II (CAR II)	3		COM
	Service-Learning	3		COM
Discipline-Specific Requirements (DSR) – Compulsory Subjects: 51 Credits				
AAE3005	Introduction to Aircraft Design and Aviation Systems	3		COM
AAE4002	Capstone Project	6	AAE3005 and ISE3009 and ME37004	COM
CBS3341P	Chinese Communication for Air Transportation	1		COM^
EIE3115	Airport Information Systems	3		COM
ELC3521	Professional Communication in English	2		COM
ENG3004	Society and the Engineer	3		COM
ENG4001	Project Management	3		COM
ISE3009	Aviation Safety and Reliability	3		COM
ISE4014	Aircraft Service Engineering and Logistics	3		COM
ISE4015	Airport Logistics Engineering	3		COM
ME37001	Fundamentals of Aerodynamics	3		COM
ME37002	Aircraft Structures and Materials	3		COM
ME37003	Aircraft Propulsion Systems	3	ME37001	COM
ME37004	Flight Mechanics and Control	3		COM
ME37010	Air Transport Operations	3		COM
ME37011	Human Factors in Aviation	3		COM

Subject Code	Subject Title	Credit	Pre-requisites (if any)	COM/ ELE
ME47010	Airworthiness	3	AAE3005 and ISE3009	COM
IC380	Integrated Aviation Engineering Project	4 (TRN)		COM
Discipline-Specific Requirements (DSR) – Elective Subjects: 6 Credits@				
EE4351S	Aircraft Electrical and Actuation Systems	3		ELE
EIE4112	Avionics Systems	3	AAE3005	ELE
ISE4016	Data Management and Operational Research	3		ELE
ISE4017	Advanced Manufacturing Technology for Aircraft Production	3	ME37002	ELE
ISE468	Managing Service Quality	3		ELE
ISE548	Risk and Crisis Management	3		ELE
ME47002	Engineering Composites	3	ME37002	ELE
ME47005	Aircraft Performance and Flight Management	3		ELE

Table 3.1 Subjects and Credits

Notes

AAE Interdisciplinary Division of Aeronautical and Aviation Engineering
CBS Department of Chinese and Bilingual Studies
EE Department of Electrical Engineering
EIE Department of Electronic and Information Engineering
ELC English Language Centre
ENG Faculty of Engineering
IC Industrial Centre
ISE Department of Industrial and Systems Engineering
ME Department of Mechanical Engineering

COM Compulsory subjects
ELE Elective subjects
TRN Training credits

^ waived for non-Chinese speakers and those students whose Chinese standards are at junior secondary level or below.
% Students who are English native speakers would be considered for credit transfer based upon their previous qualifications.
@ Students who have been waived the DSR English and Chinese language requirements have to take one more 3-credit elective to fulfil the credit requirements for graduation.

3.2 Normal Progression Pattern

(a) Table 3.2 shows a typical progression pattern. They are only indicative and by no means mandatory, whereas students may take slightly different plans

provided that the credit requirements of the intended award are fulfilled within the maximum period of registration.

(b) The progression pattern presented in Table 3.2 is for students who have been given credit transfer of the 9 credits Undergraduate Degree LCR subjects based upon their previous studies. Students not meeting the equivalent standard of the Undergraduate Degree LCR will be required to take the required subjects. Details on the Undergraduate Degree LCR subjects are given in paragraph 5.15.4 and 5.15.5 of this booklet.

Year One (33 Credits)	
Semester 1 (16 credits)	**Semester 2 (17 credits)**
CAR I	EIE3115 Airport Information Systems
AAE3005 Introduction to Aircraft Design and Aviation Systems	ISE3009 Aviation Safety and Reliability
ME37001 Fundamentals of Aerodynamics	ME37003 Aircraft Propulsion Systems
ME37002 Aircraft Structures and Materials	ME37004 Flight Mechanics and Control
ME37010 Air Transport Operations	ME37011 Human Factors in Aviation
CBS3341P Chinese Communication for Air Transportation (1 Credit) *(DSR Chinese)*	ELC3521 Professional Communication in English (2 credits) *(DSR English)*
	IC380 Integrated Aviation Engineering Project (4 training credits)
Summer Internship (Optional)	
Year Two (33 credits)	
Semester 1 (18 credits)	**Semester 2 (15 credits)**
CAR II	ENG4001 Project Management
Service Learning	ISE4014 Aircraft Service Engineering and Logistics
ENG3004 Society and the Engineer	Elective 1*
ME47010 Airworthiness (embedded with 1 credit DSR Chinese)	Elective 2*
ISE4015 Airport Logistics Engineering	
AAE4002 Capstone Project (6 credits)	
***List of electives**	
(a) EE4351S Aircraft Electrical and Actuation Systems	
(b) EIE4112 Avionics Systems	
(c) ISE468 Managing Service Quality	
(d) ISE548 Risk and Crisis Management	
(e) ISE4016 Data Management and Operational Research	
(f) ISE4017 Advanced Manufacturing Technology for Aircraft Production	
(g) ME47002 Engineering Composites	
(h) ME47005 Aircraft Performance and Flight Management	

Table 3.2

3.3 Work-Integrated Education (WIE)

In accordance with the University regulations, all full-time UGC-funded undergraduate degrees should fulfill the mandatory requirement of Work-integrated Education (WIE). WIE is "work-based learning experiences which take place in an organizational context relevant to a student's future profession, or the development of generic skills that will be valuable in that profession." It offers students the opportunity to learn to connect classroom theory with practical workplace applications through on-the-job work placements. In order to graduate from this programme, students are required to spend at least 2 weeks of full-time WIE training before graduation. Following the Faculty of Engineering's guideline, students will be awarded one WIE training credit for acquiring every two weeks' full-time training. WIE training credit will not be counted towards the Grade Point Average (GPA) or the Weighted GPA (WGPA).

Possible activities, subject to prior approval by the Programme Leader, to fulfill WIE requirements are as follows:

- Internship opportunities organized by the Division/Office of Careers and Placement Services (CAPS)
- Summer placement in industrial/commercial sector
- Placement in industrial /commercial sector during the period of deferment of study/zero-subject enrolment
- Final Year Capstone Project which involves an external client or industrial partner
- Conduct in a form proposed by students with the prior approval of the Programme Leader

3.4 Industrial Centre (IC) Training

Industrial Centre (IC) training is aimed at providing students hands-on experience on dealing with different engineering projects under the supervision of academic and technical staff at the Industrial Centre (IC) of the University. They are graded in the same manner as other taught subjects from A+ to F and will be counted in the Grade Point Average (GPA). However, they will not be counted towards the credit requirement of the award or contribute to the Award/Weighted GPA. Students must pass the IC training stipulated in the curriculum in order to be considered for the award.

3.5 Summer Internship

The University encourages students to take summer internship offered by relevant industrial sectors to provide them practical insight on how the industry works and practices in a specific aviation sector. The internship programme normally takes place for three months starting from June to August. Some students may spend this period to attend training arranged by the industry or prepare for licensed paper examination if necessary. Continued works done by the students may be possible to proceed to their final year capstone project if approval is sought from the Programme Leader.

3.6 Capstone Project

All students are required to complete a final year project which is counted for 6 academic credits. The aim of the project is to provide students an opportunity to utilize and integrate their knowledge of air transport engineering to solve real life problems related to the aviation industry. Students are encouraged to complete an industry-related project in the field of air transport engineering which may cover the areas of aircraft maintenance engineering, aircraft design and modification, logistics engineering, flight planning and scheduling, system design and modification and etc.

3.7 Curriculum Map

The following matrix shows the contribution of each discipline-specific subject to the programme outcomes through teaching, practice and measurement.

Subject Code	Intended Learning Outcomes (ILOs) of the Programme										
	PAK						POW				
	a	b	c	d	e	f	a	b@	c#	d*	e%
Compulsory Subjects											
AAE3005	T/P	T	T/P		T		T		T/P		T
AAE4002	P/M	P/M	P/M	P/M			P/M			P/M	
CBS3341P									T	T/P	
EIE3115	T	T	T								
ELC3521									T	T/P	
ENG3004							P/M		T/M	P/M	T
ENG4001			T				T		P/M	P/M	P/M
IC380						P/M	T/P	P/M			P
ISE3009		T		T/P				T/P	T/P		
ISE4014			T	T/P	P/M		P/M				T
ISE4015	P/M			P/M	T		T				T
ME37001	T/P/M	P	T/P				T				
ME37002	T/P/M	P	T		T	T/P					
ME37003	T/P	P/M	P/M		T	T/M	T/P				
ME37004	T/P	P/M	P/M	T/P			P/M				
ME37010	T							P/M			P/M
ME37011					P/M			P/M	P/M		P/M
ME47010					P/M						P/M

Subject Code	Intended Learning Outcomes (ILOs) of the Programme										
	PAK						POW				
	a	b	c	d	e	f	a	b@	c#	d*	e%
Elective Subjects											
EE4351S	T	T/P	T/P		P/M		T	P			
EIE4112	T/P	T/P	P/M		T		T				
ISE4016		P/M		T/P			T/P				
ISE4017		T/P	T	T/P		P/M	T/P		T		
ISE468		T	T/P	T/P	T		P/M		T		
ISE548			T/P	T/P	T		P/M		T/P		
ME47002	T/P	T/P	P/M	T		M			T		
ME47005	P/M	T/P	T				T		T		

T – TEACH; P – PRACTICE; M – MEASURED

Remark

@ Components include student group projects, group experiments and team meetings;

Components include case studies and analysis, and group projects;

* Components include project presentations and meeting with the industrialists;

% Components include case analysis and discussion.

Based on the requirement set by the Hong Kong Institution of Engineers (HKIE), the institution considers that any 4-year engineering programme should normally include a) one year (25%) of mathematics and basic sciences, b) at least two years (50%) of engineering topics, including engineering sciences and engineering design and c) complementary studies that support the professional nature of the curriculum (Professional Accreditation Manual - Engineering Degree, issued by HKIE, April 2011). The current 2-year articulation degree programme is also designed to meet the accreditation requirement set by HKIE. The breakdown of the subjects on each of the aforementioned content categories is shown in Table 3.3.

Subject Code	Subject Title	Mathematic & Sciences %	Engineering Science & Design %	Complementary %
Compulsory Subjects				
AAE3005	Introduction to Aircraft Design and Aviation Systems	50	40	10
AAE4002	Capstone Project	40	60	--
CBS3341P	Chinese Communication for Air Transportation	---	---	100
EIE3115	Airport Information Systems	30	60	10
ELC3521	Professional Communication in English	---	---	100
ENG3004	Society and the Engineer	--	30	70
ENG4001	Project Management	20	--	80
IC380	Integrated Aviation Engineering Project	30	70	--
ISE3009	Aviation Safety and Reliability	20	50	30
ISE4014	Aircraft Service Engineering and Logistics	30	50	20
ISE4015	Airport Logistics Engineering	--	20	80
ME37001	Fundamentals of Aerodynamics	60	40	--
ME37002	Aircraft Structures and Materials	50	50	--
ME37003	Aircraft Propulsion Systems	60	40	--
ME37004	Flight Mechanics and Control	50	50	--
ME37010	Air Transport Operations	20	40	40
ME37011	Human Factors in Aviation	--	40	60
ME47010	Airworthiness	10	30	60
Elective Subjects				
EE4351S	Aircraft Electrical and Actuation Systems	60	40	--
EIE4112	Avionics Systems	30	70	--
ISE4016	Data Management and Operational Research	30	20	50
ISE4017	Advanced Manufacturing Technology for Aircraft Production	30	60	10
ISE468	Managing Service Quality	10	30	60
ISE548	Risk and Crisis Management		50	50
ME47002	Engineering Composites	30	70	--
ME47005	Aircraft Performance and Flight Management	30	50	20

Table 3.3

4. Management and Operation

4.1 Divisional Undergraduate Programme Committee

The composition of the Divisional Undergraduate Programme Committee (DUPC) is decided by the Head of Division and approved by Faculty Board of Engineering. Normally, it consists of Programme Leaders of all degree programmes hosted by the Division, Head of Division, representative from the Divisional Learning and Teaching Committee, teaching staff representatives, representatives from major serving departments and student representatives. The DUPC is responsible for programme review and development. It will exercise the overall academic and operational responsibility for the programmes and their development within defined policies, procedures and regulations. The DUPC will meet at least twice a year, and additionally at the request of the Chairman or of one-third of its membership or of the Chairman of the Senate.

4.2 Programme Leader

The Programme Leader is appointed by the Head of Division, subject to the confirmation by the Chairman of the Faculty Board of Engineering. He/she is accountable in day-to-day operational terms to the Head of Division.

4.3 Programme Executive Group

The day-to-day operation of the programme will be carried out by the Programme Executive Group, which consists of the Programme Leader and Deputy Programme Leader. The Group reports back to the Programme Committee.

4.4 Student-Staff Consultative Group

A Student-Staff Consultative Group (SSCG) is set up as the formal channel for soliciting student feedback. It consists of student representatives and teaching colleagues of the programme. The Group is normally chaired by the Programme Leader/Deputy Programme Leader. It meets on a need basis and should meet at least once every semester to discuss student workload, teaching and learning methods, balance between subject areas, training matters and other areas of mutual concern, and to report and make recommendations to the DUPC when necessary. The reports of SSCG will be included in the annual programme review documents.

4.5 Academic Advisor

Academic advising at PolyU aims to help students to make informed and intelligent academic decisions/choices about their study at PolyU that suit their intellectual, professional and personal goals. It is instrumental to promoting student success, and plays a vital role in enhancing students' overall learning experience at PolyU. The specific aims of academic advising for this programme are:

1. To build up an early connection between the students and the Faculty, and to promote their sense of affiliation to the Faculty and the University,
2. To provide students with accurate information about the academic regulations

and requirements regarding the Air Transport Engineering programme, as well as the GUR,

3. To assist students to explore their interests, abilities and values on academic pursuits, and formulate appropriate intellectual, professional and personal goals,
4. To provide advice and guidance to students that enables them to develop and pursue a study plan for their study appropriate for meeting their intellectual, professional and personal goals,
5. To connect students to resources, opportunities and support within and outside the University that enhance their educational experiences and success,
6. To enhance the linkage among students and academic staff in the teaching/learning system,
7. To supervise and provide guidance to students on the fulfilment of WIE requirements.

Under this system, each student will be assigned an academic staff as his/her academic advisor. The main responsibilities of the academic advisor will include:

1. To meet with the Year 1 students at the common orientation and to explain the Academic Advising System to them.
2. To be accessible and available to students, and responding to their questions and concerns which are related to their studies.
3. To help students consider and clarify their intellectual, professional and personal goals.
4. To help students develop an appropriate study plan and assist in their selection of appropriate subjects to achieve their identified goals.
5. To clarify to students the academic regulations and requirements.
6. To build rapport with the students, serving as a bridge that connects them to the Division, GUR Office and Student Affairs Office.
7. To identify students with special learning needs or early signs of learning problems, and refer/encourage them to seek help or support.
8. To advise students regarding their summer internship.
9. To supervise and provide guidance to students on the fulfilment of WIE requirements.

The assignment of Academic Advisors would be made and announced to students at the commencement of each academic year.

5. Academic Regulations

The academic regulations described below are based on the information known as of July 2017. They are subject to review and changes from time to time. Students will be informed of the changes as and when appropriate. Important information relating to students' studies is also published in the Student Handbook (website: http://www.polyu.edu.hk/as/webpage/for-student/student-handbook)

5.1 Subject Registration and Withdrawal

5.1.1 In addition to programme registration, students need to register for the subjects at specified periods prior to the commencement of the semester. An add/drop period will also be scheduled for each semester / term. Students may apply for withdrawal of their registration on a subject after the add / drop period, if they have a genuine need to do so. The application should be made to the relevant programme offering department and will require the approval of both the subject lecturer and the host department Programme Leader concerned (or an alternate academic staff authorised by the programme offering department). Applications submitted after the commencement of the examination period will not be considered. For approved applications of subject withdrawal, the tuition fee paid for the subject will be forfeited and the withdrawal status of the subject will be shown in the assessment result notification and transcript of studies, but will not be counted in the calculation of the GPA.

5.1.2 The pre-requisite requirements of a subject must have been fulfilled before a student registers for that subject. However, the subject offering department has the discretion to waive the pre-requisite requirements of a subject, if deemed appropriate. If the pre-requisite subject concerned forms part of the requirements for award, the subject has to be passed in order to satisfy the graduation requirements for the programme concerned, despite the waiving of the pre-requisite.

5.1.3 Subject to the maximum study load of 21 credits per semester and the availability of study places, students are allowed to take additional subjects on top of the prescribed credit requirement for award before they become eligible for graduation. Students will be allowed to take additional subjects for broadening purpose, after they fulfil the graduation requirements and for the following semester. However, they will still be subject to the maximum study load of 21 credits per semester and the availability of places in the subjects concerned, and their enrolment will be arranged as subject-based students only and be subject to the rules on 'Admission of Subject-based Students', except that graduates from UGC-funded programmes will not be restricted to taking only subjects from a self-financed programme. For students of full-time programmes, they can take additional subjects from within or outside their programme curriculum. Students can choose freely from those subjects which are available for selection (unless they are barred because of pre-requisties).

5.2 Study Load

5.2.1 For students following the progression pattern specified for their programme, they have to take the number of credits, as specified in the Definitive Programme Document, for each semester. Students cannot drop those subjects assigned by the department unless prior approval has been given by the department.

5.2.2 The normal study load is 15 credits in a semester. The maximum study load to be taken by a student in a semester is 21 credits, unless exceptional approval is given by the Head of the programme offering department. For such cases, students should be reminded that the study load approved should not be taken as grounds for academic appeal.

5.2.3 To help improve the academic performance of students on academic probation, these students will be required to take a reduced study load in the following semester (Summer Term excluded). The maximum number of credits to be taken by the students varies according to the polices of individual departments and will be subject to the approval of the relevant authorities.

5.2.4 Students are not allowed to take zero subject in any semester, including the mandatory summer term as required by some programmes, unless they have obtained prior approval from the programme offering department; otherwise they will be classified as having unofficially withdrawn from their programme. Students who have been approved for zero subject enrolment (i.e. taking zero subject in a semester) are allowed to retain their student status and continue using campus facilities and library facilities. Any semester in which the students are allowed to take zero subject will nevertheless be counted towards the maximum period of registration.

5.2.5 Students who have obtained approval to pace their studies and students on programmes without any specified progression pattern who wish to take more than the normal load of 15 credits in a semester should seek advice from the department concerned before the selection of subjects.

5.3 Subject Exemption

Students may be exempted from taking any specified subjects, including mandatory General University Requirements (GUR) subjects, if they have successfully completed similar subjects previously in another programme or have demonstrated the level of proficiency/ability to the satisfaction of the subject offering department. If students are exempted from taking a specified subject, the credits associated with the exempted subject will not be counted towards meeting the award requirements (except for exemptions granted at admission stage). It will therefore be necessary for the students to consult the programme offering department and take another subject in order to satisfy the credit requirements for the award.

5.4 Credit Transfer

5.4.1 Students may be given credits for recognised previous studies (including mandatory General University Requirements (GUR) subjects; and the credits will be counted towards meeting the requirements for award. Transferred credits may be counted towards more than one award. The granting of credit transfer is a matter of academic judgment.

5.4.2 Credit transfer may be done with or without the grade being carried over; the former should normally be used when the credits were gained from PolyU. Credit transfer with the grade being carried over may be granted for subjects taken from outside the University, if deemed appropriate, and with due consideration to the academic equivalence of the subjects concerned and the comparability of the grading systems adopted by the University and the other approved institutions. Subject credit transfer is normally decided by the subject offering department. However, for applications which are submitted by students who have completed an approved student exchange programme, the decision will be made by the programme offering department in consultation with the subject offering departments.

5.4.3 The validity period of credits previously earned, is 8 years after the year of attainment. Normally, not more than 50% of the credit requirement for award may be transferable from approved institutions outside the University. For transfer of credits from programmes offered by PolyU, normally not more than 67% of the credit requirement for award can be transferred. In cases where both types of credits are being transferred (i.e. from programmes offered by PolyU and from approved institutions outside the University), not more than 50% of the credit requirement for award may be transferred.

5.4.4 If a student is waived from a particular stage of study on the basis of advanced qualifications held at the time of admission, the student concerned will be required to complete fewer credits for award. For these students, the exempted 'deducted' credits at admission stage will be counted towards the maximum limit for credit transfer when students apply for further credit transfer after their admission. This also applied to students admitted to an Articulation Degree or Senior Year curriculum when they claim further credit transfer after admission.

5.4.5 All credit transfers approved will take effect only in the semester for which they are approved. A student who applies for transfer of credits during the re-enrolment or the add/drop period of a particular semester will only be eligible for graduation at the end of that semester, even if the granting of credit transfer will immediately enable the student to satisfy the credit requirement for the award.

5.4.6 For credit transfer of retaken subjects, the grade attained in the last attempt should be taken in the case of credit transfer with grade being carried over. Students applying for credit transfer for a subject taken in other institutions are required to declare that the subject grade used for claiming credit transfer was attained in the last attempt of the subject in their previous studies. If a student fails in the last attempt of a retaken subject, no credit transfer should be granted, despite the fact that the student may have attained a pass grade for the subject in the earlier attempts.

5.4.7 Students should not be granted credit transfer for a subject which they have attempted and failed in their current study.

5.4.8 For students admitted to an Articulation Degree or Senior Year curriculum, irrespective of the entry qualifications they held when applying for admission to the programmes, are required to complete at least 60 credits to be eligible for award.

5.5 Zero Subject Enrolment/Deferment of study

5.5.1 Students are not allowed to have zero subject registration in any semester without prior approval from the programme offering department. Students failing to get prior approval for zero subject enrolment (i.e. taking zero subject in a semester) will be regarded as having unofficially withdrawn from the programme. Students who have been approved for zero subject enrolment (i.e. taking zero subject in a semester) are allowed to retain their student status and continue using campus facilities and library facilities. Any semester in which the students are allowed to take zero subject enrolment will nevertheless be counted towards the maximum period of registration. Students will be responsible for ensuring that they complete their studies within the maximum period of registration. A fee for retention of study place will be charged.

5.5.2 Students may apply for deferment of study if they have a genuine need to do so such as illness or posting to work outside Hong Kong. Approval from the department offering the programme is required. The deferment period will not be counted towards the maximum period of registration.

5.5.3 Application for deferment of study will be entertained only in exceptional circumstances from students who have not yet completed the first year of a full-time programme.

5.5.4 Where the period of deferment of study begins during a stage for which fees have been paid, no refund of such fees will be made.

5.5.5 Students who have been approved for deferment are not entitled to enjoy any campus facilities during the deferment period.

5.6 General Assessment Regulations

5.6.1 Students progress by credit accumulation, i.e. credits earned by passing individual subjects can be accumulated and counted towards the final award.

5.6.2 A 'level' in a programme indicates the intellectual demand placed upon students and may characterise each subject with respect to its recommended sequencing within that programme. Upper level subjects should normally build on lower level subjects. Pre-requisite requirements, if any, must therefore be spelt out on a subject basis.

5.6.3 A 'subject' is defined as a discrete section of the programme which is assigned a separate assessment. A list of subjects, together with their level and weightings, shall be published in the definitive programme document.

5.6.4 The language of assessment shall be English, unless approval is given for it to be otherwise.

5.7 Principles of Assessment

5.7.1 Assessment *of* learning and assessment *for* learning are both important for assuring the quality of student learning. Assessment *of* learning is to evaluate whether students have achieved the intended learning outcomes of the subjects that they have taken and have attained the overall learning outcomes of the academic programme at the end of their study at a standard appropriate to the award. Appropriate methods of assessment that align with the intended learning outcomes should be designed for this purpose. The assessment methods will also enable the teacher to differentiate students' different levels of performance within the subject. Assessment *for* learning is to engage students in productive learning activities through purposefully designed assessment tasks.

5.7.2 Assessment will also serve as feedback to students. The assessment criteria and standards should be made explicit to students before the start of the assessment to facilitate student learning, and feedback provided should link to the criteria and standards. Timely feedback should be provided to students so that they are aware of their progress and attainment for the purpose of improvement.

5.7.3 The ultimate authority in the University for the confirmation of academic decisions is the Senate, but for practical reasons, the Senate has delegated to the Faculty/School Boards the authority to confirm the decisions of Boards of Examiners provided these are made within the framework of the General Assessment Regulations. Recommendations from Board of Examiners which fall outside these Regulations shall be ratified by the Academic Regulations Committee (ARC) and reported to the Senate.

5.8 Assessment Methods

5.8.1 Students' performance in a subject is assessed by continuous assessment and/or examinations, at the discretion of the individual subject offering department. Where both methods are used, the weighting of each in the overall subject grade is clearly stated. The subject offering department can decide whether students are required to pass both the continuous assessment and examination components, or either component only, in order to obtain a subject pass, but this requirement (to pass both, or either, components) shall be specified. Learning outcome should be assessed by continuous assessment and/or examination appropriately, in line with the outcome-based approach.

5.8.2 Continuous assessment may include tests, assignments, projects, laboratory work, field exercises, presentations and other forms of classroom participation. Continuous Assessment assignments which involve group work should nevertheless include some individual components therein. The contribution made by each student in continuous assessment involving a group effort shall be determined and assessed separately, and this can result in different grades being awarded to students in the same group.

5.8.3 Assessment methods and parameters of subjects shall be determined by the subject offering department.

5.8.4 At the beginning of each semester, the subject teacher will inform students of the details of the assessment methods to be used within the assessment framework as specified in this document.

5.9 Progression/Academic Probation/ Deregistration

5.9.1 The Board of Examiners shall, at the end of each semester (except for Summer Term unless there are students who are eligible to graduate after completion of Summer Term subjects or the Summer Term study is mandatory for the programme), determine whether each student is

(i) eligible for progression towards an award; or
(ii) eligible for an award; or
(iii) required to be deregistered from the programme.

When a student has a Grade Point Average (GPA) (see para. 5.13.3 below) lower than 2.0, he will be put on academic probation in the following semester. If a student is able to pull his GPA up to 2.0 or above at the end of the semester, the status of "academic probation" will be lifted. The status of "academic probation" will be reflected in the examination result notification but not in the transcript of studies.

5.9.2 A student will have 'progressing' status unless he falls within any one of the following categories which may be regarded as grounds for deregistration from the programme:

(i) the student has exceeded the maximum period of registration for that programme, as specified in the Definitive Programme Document; or

(ii) the student's GPA is lower than 2.0 for two consecutive semesters and his Semester GPA in the second semester is also lower than 2.0; or

(iii) the student's GPA is lower than 2.0 for three consecutive semesters.

When a student falls within the categories as stipulated above, the Board of Examiners shall de-register the student from the programme without exception.

5.9.3 The progression of students to the following academic year will not be affected by the GPA obtained in the Summer Term, unless Summer Term study is mandatory for all students of the programme and constitutes a requirement for graduation, and is so specified in the Definite Programme Document.

5.9.4 A student may be de-registered from the programme enrolled before the time frame specified in para. 5.9.2(ii) and (iii) above if his academic performance is poor to the extent that the Board of Examiners deems that his chance of attaining a GPA of 2.0 at the end of the programme is slim or impossible.

5.10 Retaking Subjects

5.10.1 Students may retake any subject for the purpose of improving their grade without having to seek approval, but they must retake a compulsory subject which they have failed, i.e. obtained an F grade. However, students who have passed a General University Requirements (GUR) subject are not allowed to re-take the same GUR subject for the purpose of improving their grade. Retaking of subjects is with the condition that the maximum study load of 21 credits per semester is not exceeded. Students wishing to retake passed subjects will be accorded a lower priority than those who are required to retake (due to failure in a compulsory subject) and can only do so if places are available.

5.10.2 The number of retakes of a subject is not restricted. Only the grade obtained in the final attempt of retaking (even if the retake grade is lower than the original grade for originally passed subject) will be included in the calculation of the Grade Point Average (GPA). If students have passed a subject but failed after retake, credits accumulated for passing the subject in a previous attempt will remain valid for satisfying the credit requirement for award. (The grades obtained in previous attempts will only be reflected in transcript of studies.)

5.10.3 In cases where a student takes another subject to replace a failed elective subject, the fail grade will be taken into account in the calculation of the GPA, despite the passing of the replacement subject. Likewise, students who fail a Cluster Area Requirement (CAR) subject may need to take another subject from the same Cluster Area in order to fulfill this part of the GUR, since the original CAR subject may not be offered; in such cases, the fail grade for the first CAR subject will be taken into account in the calculation of the GPA, despite the passing of the second CAR subject. (*Note 1*)

Note 1: In these circumstances when students do not have a choice to retake a failed subject, such as when the failed subject has been phased out, a 'tie-subject' arrangement can be made with the approval of the Faculty/School Board. Under the arrangement, another appropriate subject can be taken as equivalent to the subject which is not offered. Upon passing the equivalent subject, the fail grade of the original subject will be replaced by the latest grade of the retake subject and the failure grade of the original subject will not be taken into account in the calculation of the GPA.

5.11 Appeal Against Assessment Results/De-registration Decisions by the Board of Examiners

A student may appeal against the decision of the Board of Examiners within a stipulated period after the public announcement of the examination results (this refers to the date when results are announced to students via the web). Students should refer to the Student Handbook for details on the appeal procedures.

5.12 Exceptional Circumstances

Absence from an assessment component

5.12.1 If a student is unable to complete all the assessment components of a subject, due to illness or other circumstances which are beyond his control and considered by the subject offering department as legitimate, the department will determine whether the student will have to complete a late assessment and, if so, by what means. This late assessment shall take place at the earliest opportunity, and before the commencement of the following academic year (except that for Summer Term, which may take place within 3 weeks after the finalisation of Summer Term results). If the late assessment cannot be completed before the commencement of the following academic year, the Faculty/School Board Chairman shall decide on an appropriate time for completion of the late assessment.

5.12.2 The student concerned is required to submit his/her application for late assessment in writing to the Head of Department offering the subject, within five working days from the date of the examination, together with any supporting documents. Approval of applications for late assessment and the means for such late assessments shall be given by the Head of Department offering the subject or the Subject Lecturer concerned, in consultation with the Programme Leader.

Assessment to be completed

5.12.3 For cases where students fail marginally in one of the components within a subject, the BoE can defer making a final decision until the students concerned have completed the necessary remedial work to the satisfaction of the subject examiner(s). The remedial work must not take the form of re-examination.

Aegrotat award

5.12.4 If a student is unable to complete the requirements of the programme in question for the award due to very serious illness, or other very special circumstances which are beyond his control, and considered by the Board of Examiners as legitimate, the Faculty/School Board will determine whether the student will be granted an aegrotat award. Aegrotat award will be granted under very exceptional circumstances.

5.12.5 A student who has been offered an aegrotat award shall have the right to opt either to accept such an award, or request to be assessed on another occasion to be stipulated by the Board of Examiners; the student's exercise of this option shall be irrevocable.

5.12.6 The acceptance of an aegrotat award by a student shall disqualify him from any subsequent assessment for the same award.

5.12.7 An aegrotat award shall normally not be classified, and the award parchment shall not state that it is an aegrotat award. However, the Board of Examiners may determine whether the award should be classified, provided that they have adequate information on the students' academic performance.

Other particular circumstances

5.12.8 A student's particular circumstances may influence the procedures for assessment, but not the standard of performance expected in the assessment.

5.13 Grading

5.13.1 Assessment grades shall be awarded on a criterion-referenced basis. A student's overall performance in a subject (including GUR subjects) shall be graded as follows:

Subject grade	*Short description*	*Elaboration on subject grading description*
A+	Exceptionally Outstanding	The student's work is exceptionally outstanding. It exceeds the intended subject learning outcomes in all regards.
A	Outstanding	The student's work is outstanding. It exceeds the intended subject learning outcomes in nearly all regards.
B+	Very Good	The student's work is very good. It exceeds the intended subject learning outcomes in most regards.
B	Good	The student's work is good. It exceeds the intended subject learning outcomes in some regards.
C+	Wholly Satisfactory	The student's work is wholly satisfactory. It fully meets the intended subject learning outcomes.
C	Satisfactory	The student's work is satisfactory. It largely meets the intended subject learning outcomes.
D+	Barely Satisfactory	The student's work is barely satisfactory. It marginally meets the intended subject learning outcomes.
D	Barely Adequate	The student's work is barely adequate. It meets the intended subject learning outcomes only in some regards.
F	Inadequate	The student's work is inadequate. It fails to meet many of the intended subject learning outcomes.

'F' is a subject failure grade, whilst all others ('D' to 'A+') are subject passing grades. No credit will be earned if a subject is failed.

5.13.2 A numeral grade point is assigned to each subject grade, as follows:

Grade	*Grade Point*
A+	4.5
A	4
B+	3.5
B	3
C+	2.5
C	2
D+	1.5
D	1
F	0

5.13.3 At the end of each semester/term, a Grade Point Average (GPA) will be computed as follows, and based on the grade point of all the subjects:

$$GPA = \frac{\sum_{n} \text{Subject Grade Point} \times \text{Subject Credit Value}}{\sum_{n} \text{Subject Credit Value}}$$

where n = number of all subjects (inclusive of failed subjects) taken by the student up to and including the latest semester/term. For subjects which have been retaken, only the grade point obtained in the final attempt will be included in the GPA calculation

In addition, the following subjects will be excluded from the GPA calculation:

(i) Exempted subjects
(ii) Ungraded subjects
(iii) Incomplete subjects
(iv) Subjects for which credit transfer has been approved, but without any grade assigned[1]
(v) Subjects from which a student has been allowed to withdraw (i.e. those with the code 'W')

Subject which has been given an "S" code, i.e. absent from assessment, will be included in the GPA calculation and will be counted as "zero" grade point. GPA is thus the unweighted cumulative average calculated for a student, for all relevant subjects taken from the start of the programme to a particular point of time. GPA is an indicator of overall performance, and is capped at 4.0.

5.13.4 For programmes with training components, whether these training credits[2] will be counted in the GPA calculation will be decided by the programme offering department.

5.14 Different Types of GPA's

5.14.1 GPA's will be calculated for each Semester including the Summer Term. This Semester GPA will be used to determine students' eligibility to progress to the next Semester alongside with the 'cumulative GPA'. However, the Semester GPA calculated for the Summer Term will not be used for this purpose, unless the Summer Term study is mandatory for all students of the programme concerned and constitutes part of the graduation requirements.

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[1] Subjects taken in PolyU or elsewhere and with grades assigned, and for which credit transfer has been approved, will be included in the GPA calculation.

[2] "Training credits" is used as a generic term only, and also includes clinical/field credits for programmes in different study disciplines. Laboratory experiments done as a subject/an integral part of a subject to satisfy the academic requirements is not considered to be practical training.

5.14.2 The GPA calculated after the second Semester of the students' study is therefore a 'cumulative' GPA of all the subjects taken so far by students, and without applying any level weighting.

5.14.3 Along with the 'cumulative' GPA, a weighted GPA will also be calculated, to give an indication to the Board of Examiners on the award classification which a student will likely get if he makes steady progress on his academic studies. GUR subjects will be included in the calculation of weighted GPA for all programmes.

5.14.4 When a student has satisfied the requirements for award, an award GPA will be calculated to determine his award classification. GUR subjects will be included in the calculation of award GPA for all programmes.

5.15 University Graduation Requirements

5.15.1 To be eligible for the award of BEng(Hons) in Air Transport Engineering, an Articulation Degree award under the 4-year full-time undergraduate curriculum, a student must:

(i) Complete successfully 66 credits.
(ii) Satisfy all the 'compulsory' and elective' requirements
(ii) Earn a cumulative GPA of 2.0 or above at graduation.
(iii) Complete successfully the mandatory WIE component and stipulated IC training requirements.
(iv) Satisfy the residential requirement for at least one-third of the credits required for the award
(v) Satisfy the following GUR requirements:

Areas	**Credits**
▪ Language and Communication Requirements (LCR)	9 (see *Note 1*)
▪ Service-Learning	3
▪ Cluster-Area Requirements (CAR) 6 credits chosen from the following 4 cluster areas o Human Nature, Relations and Development o Community, Organisation and Globalisation o History, Cultures and World Views o Science, Technology and Environment and of which o No more than 3 credits (normally 1 subject) are from the same cluster area; o Need to fulfil the English and Chinese reading and writing requirements; and o Minimum of 3 credits should be in the subjects designated as 'China-related' for fulfilling the China Studies requirement (CSR)	6 (see *Note 2*)
Total GUR credits	18

Note 1: This is normally not required. Only those students not meeting the equivalent standard of the Undergraduate Degree LCR (based on their previous studies in AD/HD programmes and their academic performance) will be required to take degree LCR subjects (as stated in 5.15.4 and 5.15.5 below) on top of the normal curriculum requirement. Non-Chinese speakers and those students whose Chinese standards are at junior secondary level or below will by default be exempted from the DSR - Chinese and CAR - Chinese Reading and Writing requirements. However, this group of students would still be required to take one Chinese LCR subject to fulfil their Chinese LCR.

Note 2: Students may apply for a waiver if they have fulfilled the English and Chinese reading and writing requirements and/or CSR requirement in their previous studies.

(vi) Satisfy any other requirements as specified in the Definitive Programme Document of the award and as specified by the University.

5.15.2 There are subjects which are designed to fulfil the credit requirement of different types of subject. Students passing these subjects will be regarded as having fulfilled the credit requirements of the particular types of subject concerned. Nevertheless, the subject passed will only be counted once in fulfilling the credit requirements of the award, and the students will be required to take another subject in order to meet the total credit requirement of the programme concerned. Level-0 subjects and training subjects (including clinical/field training) will not be counted to fulfill free elective requirement for graduation purpose.

Language and Communication Requirements (LCR)

5.15.3 LCR comprises four major components of the overall English and Chinese language requirements as described below in order to be eligible for graduation:

(i) Language and Communication Requirements (LCR) in English (6 credits) and Chinese (3 credits), as stated in 5.15.4 and 5.15.5 below;
(ii) Writing Requirement, as stated in 5.15.6 below;
(iii) Reading Requirement, as stated in 5.15.7 below; and
(iv) Discipline-Specific Language Requirement, as stated in 5.15.8 below.

English

5.15.4 All undergraduate students must successfully complete two 3-credit English language subjects as stipulated by the University (Table 1). These subjects are designed to suit students' different levels of English language proficiency at entry, as determined by their HKDSE score or the English Language Centre (ELC) entry assessment (when no HKDSE score is available).

Students who can demonstrate that they have achieved a level beyond that of the LCR proficient level subjects as listed in Table 2 (based on an assessment by ELC) may apply for subject exemption or credit transfer of the LCR subject or subjects concerned.

Table 1: Framework of English LCR subjects

HKDSE	Subject 1	Subject 2
Level 5 or equivalent	Advanced English for University Studies (AEUS) 3 credits	Any LCR Proficient level subject in English (see Table 2) 3 credits
Level 4 or equivalent	English for University Studies (EUS) 3 credits	Advanced English for University Studies (AEUS) 3 credits
Level 3 or equivalent	Practical English for University Studies (PEUS) 3 credits	English for University Studies (EUS) 3 credits

Table 2: LCR Proficient level subjects in English

For students entering with HKDSE Level 5, or at an equivalent level or above	Advanced English Reading and Writing Skills	3 credits each
	Persuasive Communication	
	English in Literature and Film	

Chinese

5.15.5 All undergraduate students are required to successfully complete one 3-credit Chinese language subject as stipulated by the University (Table 3). These Chinese subjects are designed to suit students' different levels of Chinese language proficiency at entry, as determined by their HKDSE score or the Chinese Language Centre (CLC) entry assessment (when no HKDSE score is available). Students can also opt to take additional Chinese LCR subjects (Table 5) in their free electives.

Students who are non-Chinese speakers (NCS), or whose Chinese standards are at junior secondary level or below, will also be required to take one LCR subject specially designed to suit their language background and entry standard as shown in Table 4.

Students who can demonstrate that they have achieved a level beyond that of the course "Advanced Communication Skills in Chinese" as listed in Table 3 (based on an assessment made by CLC) may apply for subject exemption or credit transfer of the LCR subject concerned.

Table 3: Framework of Chinese LCR subjects

	Required subject
HKDSE Level 4 and 5 or equivalent	Advanced Communication Skills in Chinese (ACSC) 3 credits
HKDSE Level 3 or equivalent	Fundamentals of Chinese Communication (FCC) 3 credits
For non-Chinese speakers or students whose Chinese standards are at junior secondary level or below	one subject from Table 4 below

Table 4: Chinese LCR Subjects for non-Chinese speakers or students whose Chinese standards are at junior secondary level or below

Subject	**Pre-requisite/exclusion**	
Chinese I (for non-Chinese speaking students)	• For non-Chinese speaking students at beginners' level	3 credits each
Chinese II (for non-Chinese speaking students)	• For non-Chinese speaking students; and • Students who have completed Chinese I or equivalent	
Chinese III (for non-Chinese speaking students)	• For non-Chinese speaking students at higher competence levels; and • Students who have completed Chinese II or equivalent	
Chinese IV (for non-Chinese speaking students)	• For non-Chinese students at intermediate competence levels; and • Students who have completed Chinese III or equivalent	
Chinese Literature – Linguistics and Cultural Perspectives (for non-Chinese speaking students)	• For non-Chinese speaking students at higher competence levels	

Table 5: Other LCR Electives in Chinese

Subject	Pre-requisite/exclusion	
Chinese and the Multimedia	• For students entering with HKDSE level 4 or above; or • Students with advanced competence level as determined by the entry assessment; or • Students who have completed "Fundamentals of Chinese Communication"	3 credits each
Creative writing in Chinese	• For students entering with HKDSE level 4 or above; or • Students with advanced competence level as determined by the entry assessment; or • Students who have completed "Fundamentals of Chinese Communication"	
Elementary Cantonese	For students whose native language is not Cantonese	
Intermediate Cantonese	• Successful completion of "Elementary Cantonese"; or • Meet a certain standard in a pre-course assessment	
Putonghua in the Workplace	• Students who have completed "Fundamentals of Chinese Communication" or could demonstrate with proof their basic proficiency in Putonghua • For students whose native language is not Putonghua	

Writing Requirement

5.15.6 In additional to the LCR in English and Chinese explained above, all students must also, among the Cluster Areas Requirement (CAR) subjects they take (see para. 5.15.10 below), pass one subject that includes the requirement for a substantial piece of writing in English and one subject with the requirement for a substantial piece of writing in Chinese.

Reading Requirement

5.15.7 All students must, among the CAR subjects they take, pass one subject that includes the requirement for the reading of an extensive text in English and one subject with the requirement for the reading of an extensive text in Chinese.

A list of approved CAR subjects for meeting the Writing Requirement (with a "W" designation) and for meeting the Reading Requirement (with an "R" designation) is shown at: https://www2.polyu.edu.hk/as/Polyu/GUR/index.htm

Non-Chinese speakers and those students whose Chinese standards are at junior secondary level or below will by default be exempted from the DSR - Chinese and CAR - Chinese Reading and Writing requirements. However, this group of

students would still be required to take one Chinese LCR subject to fulfil their Chinese LCR.

Discipline-Specific Language Requirement

5.15.8 In addition to the LCR and Reading and Writing Requirements, students also have to complete 4 credits of discipline-specific language requirements (2 credits in English and 2 credits in Chinese) as specified in the curriculum requirements of their Major.

Students who are non-Chinese speakers or those whose Chinese standards are at junior secondary level or below will be exempted from the Discipline-Specific Chinese Language requirement. These students must take another subject (except Level-0 subjects and training subjects (including clinical/field training)) to make up for the total credit requirement.

Service-Learning

5.15.9 All students must successfully complete one 3-credit subject designated to meet the Service-Learning Requirement, in which they are required to (i) participate in substantial community service or civic engagement activities that will benefit the service users or the community at large in a meaningful way, (ii) apply the knowledge and skills acquired from their Major or other learning experiences at the University to the community service activities, and (iii) reflect on their service learning experience in order to link theory with practice for the development of a stronger sense of ethical, social and national responsibility.

These subjects may take the form of:

- An open-to-all GUR service-learning subject
- A GUR service-learning subject targeted at a particular student group (e.g. a Broad Discipline), or
- A customised DSR subject (core or elective) within the Major/Minor with all the required features and components to meet the Service-Learning Requirement.

Students who have satisfied the Service-Learning Requirement via a customised DSR subject will be required to take another 3-credit subject to make up for the total credit requirement.

A list of designated subjects for meeting the service-learning requirement is available at: https://www2.polyu.edu.hk/as/Polyu/GUR/index.htm

Cluster Areas Requirement (CAR)

5.15.10 To expand students' intellectual capacity beyond their disciplinary domain and to enable them to tackle professional and global issues from a multidisciplinary perspective, students are required to successfully complete two 3-credit subjects chosen from the following four Cluster Areas:

- Human Nature, Relations and Development
- Community, Organisation and Globalisation
- History, Culture and World Views
- Science, Technology and Environment

and of which

- o No more than 3 credits are from the same cluster area;
- o Need to fulfil the English and Chinese reading and writing requirements; and
- o Minimum of 3 credits should be in the subjects designated as 'China-related'

A list of CAR subjects under each of the four Cluster Areas is available at: https://www2.polyu.edu.hk/as/Polyu/GUR/index.htm

China Studies Requirement

5.15.11 Of the 6 credits of CAR described in para. 5.15.10 above, students are required to successfully complete a minimum of 3 credits on CAR subjects designated as "China-related". The purpose is to enable students to gain an increased understanding of China (e.g. its history, culture and society, as well as emerging issues or challenges).

A list of approved CAR subjects for meeting the China Studies Requirement is available at: https://www2.polyu.edu.hk/as/Polyu/GUR/index.htm

5.16 Guidelines for Award Classification

5.16.1 In using these guidelines, the Board of Examiners shall exercise its judgement in coming to its conclusions as to the award for each student, and where appropriate, may use other relevant information.

5.16.2 The Weighted GPA will be used as a guide to help determine award classifications. It is calculated as follows:

$$\text{Weighted GPA} = \frac{\sum_{n} \text{Subject Grade Point} \times \text{Subject Credit Value} \times W_i}{\sum_{n} \text{Subject Credit Value} \times W_i}$$

where Wi = weighting to be assigned according to the level of the subject
n = number of all subjects counted in GPA calculation as set out in para. 5.13.3, except those exclusions specified in para. 5.16.3.

For calculating the weighted GPA (and award GPA) to determine the Honours classification of students who satisfy the graduation requirements of Bachelor's degree awards, a University-wide standard weighting will be applied to all subjects of the same level, with a weighting of 2 for Level 1 and 2 subjects, a weighting of 3 for Level 3, 4 and 5 subjects. Same as for GPA, Weighted GPA is capped at 4.0.

5.16.3 Any subjects passed after the graduation requirement has been met will not be taken into account of in the grade point calculation for award classification.

5.17 Classification of Awards

5.17.1 For Honours degree programmes, the awards will be classified as follows:

First Class Honours
Second Class Honours (Division 1)
Second Class Honours (Division 2)
Third Class Honours

5.17.2 The following are guidelines for Boards of Examiners' reference in determining award classifications:

Honours degrees	*Guidelines*
First Class Honours	The student's performance/attainment is outstanding, and identifies him as exceptionally able in the field covered by the programme in question.
Second Class Honours (Division 1)	The student has reached a standard of performance/ attainment which is more than satisfactory but less than outstanding.
Second Class Honours (Division 2)	The student has reached a standard of performance/ attainment judged to be satisfactory, and clearly higher than the 'essential minimum' required for graduation.
Third Class Honours	The student has attained the 'essential minimum' required for graduation at a standard ranging from just adequate to just satisfactory.

5.17.3 Under exceptional circumstances, a student who has completed an Honours degree programme, but has not attained Honours standard, may be awarded a Pass-without-Honours degree. A Pass-without-Honours degree award will be recommended, when the student has demonstrated a level of final attainment which is below the 'essential minimum' required for graduation with Honours from the programme in question, but when he has nonetheless covered the prescribed work of the programme in an adequate fashion, while failing to show sufficient evidence of the intellectual calibre expected of Honours degree graduates. For example, if a student in an Honours degree programme has a Grade Point Average (GPA) of 2.0 or more, but his Weighted GPA is less than 2.0, he may be considered for a Pass-without-Honours classification. A Pass-without-Honours is an unclassified award, but the award parchment will not include this specification.

5.17.4 Students who have committed academic dishonesty will be subject to the penalty of the lowering of award classification by one level. For undergraduate students who should be awarded a Third class Honours degree, they will be downgraded to a Pass-without-Honours. The minimum of downgraded overall result will be kept at a Pass.

5.17.5 The following is a set of indicators, for Boards of Examiners' reference, which can be used in helping to determine award classification:

Honours classification	**Weighted GPA**
First Class Honours	3.7^{+} - 4
Second Class Honours (Division 1)	3.2^{+} - 3.7^{-}
Second Class Honours (Division 2)	2.3^{+} - 3.2^{-}
Third Class Honours	2.0 - 2.3^{-}

Note: "+" sign denotes 'equal to and more than'; "–" sign denotes 'less than'.

There is no requirement for Boards of Examiners to produce award lists which conform to the above guidelines.

5.18 Recording of Disciplinary Actions in Students' Records

5.18.1 With effect from Semester One of 2015/16, disciplinary actions against students' misconducts will be recorded in students' records.

5.18.2 Students who are found guilty of academic dishonesty will be subject to the penalty of having the subject result concerned disqualified and be given a failure grade with a remark denoting 'Disqualification of result due to academic dishonesty'. The remark will be shown in the students' record as well as the assessment result notification and transcript of studies, until their leaving the University.

5.18.3 Students who have committed disciplinary offences (covering both academic and non-academic related matters) will be put on 'disciplinary probation'. The status of 'disciplinary probation' will be shown in the students' record as well as the assessment result notification, transcript of studies and testimonial during the probation period, until their leaving the University. The disciplinary probation is normally one year unless otherwise decided by the Student Discipline Committee.

5.18.4 The University reserves the right to withhold the issuance of any certificate of study and an award parchment to a student who has unsettled matters with the University, or subject to disciplinary action.

5.19 Graduation

A student is required to graduate as soon as he/she satisfies the graduation requirements as stipulated in para. 5.15 above. The student concerned is required to apply for graduation, in the semester in which he/she is able to fulfil all his/her graduation requirements, and after the add/drop period for that semester has ended.

PART B SUBJECT SYLLABI

Discipline-Specific Requirements (DSR)

Compulsory Subjects

Subject Description Form

Subject Code	AAE3005
Subject Title	Introduction to Aircraft Design and Aviation Systems
Credit Value	3
Level	3
Pre-requisite / Co-requisite/ Exclusion	Nil
Objectives	To develop students' knowledge on the components and operating principles of essential mechanical, electrical and avionics systems in civil transport aircraft. To provide students an overview of the components of aviation systems. To develop students' understanding of the up-to-date operational concepts, technology applications and practices in aviation industry.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a. understand key aircraft systems including flight control system, fuel system, propulsion system, hydraulic system, electrical systems, avionics system, environmental control system, pneumatic system, and emergency system; b. explain the relationship among major aviation systems; c. understand air traffic management, flight standards, airworthiness provided by regulatory bodies, and accident investigation.
Subject Synopsis/ Indicative Syllabus	***Atmospheric Condition*** - Properties of air. The Earth's atmosphere. Standard atmosphere. Atmospheric wind and turbulence. ***Flight Control Systems*** - Principles of flight control. Primary and secondary flight controls. ***Powerplant and Fuel Systems*** - Aircraft engine. Turbojet engine. Characteristics of aircraft fuel systems. ***Hydraulic Systems and Pneumatic Systems*** – Hydraulic systems in aircraft and their applications. Landing-gear system. Braking and anti-skid. Use of bleed air. Bleed air control. Thrust reversers. ***Electrical Systems*** - Civil aircraft electrical system. Electrical power generation. Motor and Actuators. Electrical loads. ***Avionics Systems*** – Regulatory and Advisory Agencies related to

<table>
<tr><td></td><td>avionics systems. Fundamentals of airborne communication systems. Basic principles of terrestrial radio navigation and landing aids.

Environmental Control Systems - Environmental control system design, Lighting, Air conditioning. Cabin pressurization.

Land Gear Systems - Aircraft landing gear, gear arrangement, retraction and detraction, structures and tyres.

Emergency Systems - Emergency power generation. Battery system. Warning systems. Fire detection and suppression.

Aviation Systems – Key aviation system components. Relationship among various components. Flight planning. Flight simulator. Airport operation. Airline management.

Aviation Authorities, Air Agreements and Government Flying Service - Key aviation authorities. Bi-lateral agreement. Air transportation agreements. Role of Government Flying Service.

Air Traffic Control – Radar fundamentals & basic surveillance systems, e.g. ATCRBS.</td></tr>
<tr><td>Teaching/Learning Methodology</td><td>Lectures and tutorials are used to deliver the fundamental knowledge in relation to various aircraft systems and aviation systems (outcomes a to c).

<table>
<tr><td rowspan="2">Teaching/Learning Methodology</td><td colspan="3">Intended subject learning outcomes</td></tr>
<tr><td>a</td><td>b</td><td>c</td></tr>
<tr><td>1. Lectures</td><td>✓</td><td>✓</td><td>✓</td></tr>
<tr><td>2. Tutorials</td><td>✓</td><td>✓</td><td>✓</td></tr>
</table>
</td></tr>
<tr><td>Assessment Methods in Alignment with Intended Learning Outcomes</td><td>
<table>
<tr><td rowspan="2">Specific assessment methods/tasks</td><td rowspan="2">% weighting</td><td colspan="3">Intended subject learning outcomes to be assessed (Please tick as appropriate)</td></tr>
<tr><td>a</td><td>b</td><td>c</td></tr>
<tr><td>1. Examination</td><td>50%</td><td>✓</td><td>✓</td><td>✓</td></tr>
<tr><td>2. Assignments and quiz</td><td>50%</td><td>✓</td><td>✓</td><td>✓</td></tr>
<tr><td>Total</td><td>100 %</td><td colspan="3"></td></tr>
</table>

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:</td></tr>
</table>

	Overall Assessment: 0.5 × End of Subject Examination + 0.5 × Continuous Assessment Examination is adopted to assess students on the overall understanding and the ability of applying the concepts. It is supplemented by the tests, assignments and laboratory reports which provide timely feedbacks to both lecturers and students on various topics of the syllabus.	
Student Study Effort Expected	Class contact:	
	▪ Lecture	33 Hrs.
	▪ Tutorial	6 Hrs.
	Other student study effort:	
	▪ Self Study	45 Hrs.
	▪ Case study report preparation and presentation	21 Hrs.
	Total student study effort	105 Hrs.
Reading List and References	1. I. Moir amd A.G. Seabridge, Design and Development of Aircraft Systems – An Introduction, First Edition, AIAA Education Series, 2004. 2. Richard De Neufville. Airport Systems: Planning, Design, and Management, McGraw-Hill, 2003. 3. Jon D. Fricker and Robert K. Whitford, Fundamentals of Transportation Engineering: A Multimodel Systems Approach, Prentice-Hall, 2004. 4. Helfrick A, Principles of Avionics, 7th Edition, Avionics Communications, 2012.	

October 2016

Subject Description Form

Subject Code	AAE4002
Subject Title	Capstone Project
Credit Value	6
Level	4
Pre-requisite / Co-requisite/ Exclusion	Pre-requisite: AAE3005 Introduction to Aircraft Design and Aviation Systems; and ISE3009 Aviation Safety and Reliability; and ME37004 Flight Mechanics and Control
Objectives	To provide students an opportunity to utilize and integrate their knowledge of air transport engineering to solve real life problems related to the aviation industry.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a. Understand the workflow of airport/airline/aircraft maintenance operations. b. Apply knowledge and up-to-date technologies to solve common problems in the aviation industry. c. Work effectively and make contributions independently in a multi-disciplinary aviation business team and apply project management technique to ensure successful completion of the project. d. Understand the importance of life-long learning and perform literature search to upkeep with the state-of-the-art aviation technologies. e. Effectively communicate with different parties and stakeholders.
Subject Synopsis/ Indicative Syllabus	Each student is expected to complete an industry-related project in the field of air transport engineering which may cover the areas of aircraft maintenance engineering, aircraft design and modification, logistics engineering, flight planning and scheduling, system design and modification and etc.
Teaching/Learning Methodology	The project is taught through guided studies. The students are given the project title, objectives and description and guided by the project supervisor(s) to go through different stages of the project. For industrial projects, one academic and one industrial supervisor will be assigned to a student.

Teaching/Learning Methodology	a	b	c	d	e
Site visit	✓				
Guided study	✓	✓	✓	✓	✓
Oral presentation					✓
Report writing			✓		✓

Assessment Methods in Alignment with Intended Learning Outcomes

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)				
		a	b	c	d	e
1. Continuous monitoring	15	✓	✓	✓	✓	✓
2. Interim report	15	✓	✓	✓	✓	✓
3. Final report	50	✓	✓	✓	✓	✓
4. Oral examination	20	✓	✓			✓
Total	100 %					

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

Overall Assessment: 1.0 x continuous assessment

Performance of each student should be assessed individually by the supervisor(s), an independent assessor based on their working attitude, quality of works and report writing. Their communication skill is assessed through the oral presentation.

Student Study Effort Expected		
	Class contact:	
	▪ Guided study	78 Hrs.
	Other student study effort:	
	▪ Conducting project	78 Hrs.
	▪ Literature search and private study	65 Hrs.
	▪ Training (Report writing)	13 Hrs.
	Total student study effort	234 Hrs.

Reading List and References	To be advised by supervisor

Subject Description Form

Subject Code	CBS3341P
Subject Title	Chinese Communication for Air Transportation
Credit Value	1
Level	3
Pre-requisite / Co-requisite	Nil
Objectives	This is a discipline-specific Chinese subject which aims at developing the students' language competence in Putonghua and written Chinese for professional communication necessary for them to communicate effectively with various parties and stakeholders in the sector of aviation.
Intended Learning Outcomes	Upon completion of the subject, and in relation to effective communication with a variety of intended readers/audiences in Chinese, students will be able to: a. read and write professional reports / manuals for specific purposes; b. understand and use the terminology of Aviation and Aeronautics in Chinese; c. produce discipline-related Chinese genres (e.g. notices, guidelines, Aeronautical circulars, other formal letters / emails) with appropriate text structures, interactive strategies and language expressions for different intended readers; d. communicate in Putonghua for various speech functions in professional context of Aviation such as introducing, clarifying and explaining.
Subject Synopsis/ Indicative Syllabus	1. Reports in Chinese in the Aviation area • Planning and organizing reports • Explaining the background, rationale, objectives, scope and significance of a report • Referring to the literature to substantiate reports 2. Analyzing the Chinese lexical structure of the frequently used terms from the linguistic viewpoint *(see Note below)*. 3. Specific Chinese writing in a wide range of genres • Profession-related literacy in written Chinese for both internal and external purposes, such as writing of notices, guidelines and Aeronautical circulars, etc.

	4. Oral presentations • Giving formal presentations and engaging in formal discussions in Putonghua • Selecting contents for audience-focused presentations • Choosing language and style appropriate to the intended audience Note: The one-credit DSR-Chinese content "The Chinese Vocabulary and Terminology in Air Transportation" is embedded into the subject "ME47010 Airworthiness"
Teaching/Learning Methodology	The subject is designed to develop the students' Chinese language skills, both oral and written, that students need to communicate effectively and professionally with a variety of stakeholders of aviation-related projects. It builds upon the language and communication skills covered in GUR language training subjects. The study approach is primarily seminar-based. Seminar activities include instructor input as well as individual and group work, involving drafting and evaluating texts, mini-presentations, discussions and simulations. The learning and teaching activities in the subject will focus on a course-long report which will engage students in proposing on an aviation-related report to different intended readers/audiences. During the course, students will be involved in: - planning and researching - writing and reporting - giving oral presentations to intended stakeholders in Putonghua

Assessment Methods in Alignment with Intended Learning Outcomes

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)			
		a	b	c	d
1. Report in Chinese	35%	✓	✓		
2. Practical Writing	25%		✓	✓	
3. PPT Presentation	30%		✓		✓
4. Formal discussions and Class participation	10%	✓	✓	✓	✓
Total	100 %				

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

Subject assessment 100% coursework

For the course work, students will be assessed by the final products of the assigned exercises.

Each assignment will be assessed in terms of criterion reference assessing.

The overall achievement is obtained by formative assessment.

Student Study Effort Expected		
	Class contact:	
	▪ Lecture	9 Hrs.
	▪ Tutorial	4 Hrs.
	Other student study effort:	
	▪ Outside class practice, e.g. planning, discussing, and writing assignments and report. ▪ Researching and self-study	28 Hrs.
	Total student study effort	41 Hrs.

Reading List and References	1. 國際民航組織（1997）《國標民航運輸管理手冊（國際民航組織第9626號文件）》。中國民航出版社，第1版。 2. 民用航空術語編輯組（2002）《民用航空旅客運輸術語》。中國標準出版社。 3. 民用航空術語編輯組（2002）《民用航空貨物運輸術語》。中國標準出版社。 4. 于成鯤主編（2003）《現代應用文》。復旦大學出版社。 5. 鄭笑平（2005）《科技寫作》。河南人民出版社。 6. 邵敬敏（2007）《現代漢語通論》。上海教育出版社。 7. 姜波（2009）《飛機檢測與維修實用手冊》（第1-4卷）。吉林：吉林科學技術出版社。 8. 于成鯤等主編（2011）《當代應用文寫作規範叢書》。復旦大學出版社。

July 2014

Subject Description Form

Subject Code	EIE3115 (for 48401)
Subject Title	Airport Information Systems
Credit Value	3
Level	3
Pre-requisite / Co-requisite/ Exclusion	Nil
Objectives	To provide students with knowledge of information and communications technologies employed in airports.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: 1. possess essential knowledge and skills in the area of information systems employed on the ground for aviation industry; 2. apply their knowledge, skills and hand-on experience to operate and maintain existing airport information systems; analyze and develop new subsystems for desired needs; 3. extend their knowledge of airport information systems to different situations of engineering context and professional practice.
Subject Synopsis/ Indicative Syllabus	**Information Technology Fundamentals:** Data presentation & storage; Data processing and displays; Practice of resource management and privilege control in modern computers clusters and operating systems. **Database Systems:** Concept of relational database and its architecture; Structural Query Language (SQL), database design, implementation and management. **Computer Networking:** OSI Model; Concepts of Client-Server Architecture and various internet applications (HTTP/FTP/DNS); Principles on packet routing and associated network security measures. **Practical Information Systems & Equipment:** • Common Use Terminal Equipment CUTE; • Common Use Self Service Check-in CUSS; • Common Use Passenger Processing Systems CUPPS; • IATA Fast Travel Program (Bar Coded Boarding Pass BCBP); • IATA Fast Travel Program (Near Field Communications NFC); • Passenger Facilitation (Automatic Border Control ABC); • Passenger Facilitation (Radio Frequency Identification RFID in Baggage Processing); • Flight Information Displays FIDS
Teaching/Learning Methodology	1. The teaching and learning methods include lectures/tutorial sessions, workshops, homework assignments, test, case study report and examination. 2. The continuous assessment and examination are aimed at providing students with integrated knowledge required for aviation information systems. 3. Technical/practical examples and problems are raised and discussed in class/tutorial sessions.

Teaching/Learning Methodology	Intended subject learning outcomes		
	1	2	3
1. Lecture	√	√	
2. Tutorial / Workshop	√	√	
3. Homework assignment	√	√	
4. Case study report and presentation	√	√	√

Assessment Methods in Alignment with Intended Learning Outcomes

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)		
		1	2	3
1. Homework assignment	10%	√	√	
2. Quizzes	20%	√	√	
3. Case study report and presentation	20%	√	√	√
4. Examination	50%	√	√	√
Total	100%			

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

Overall Assessment:

0.50 × End of Subject Examination + 0.50 × Continuous Assessment

The continuous assessment consists of three components: homework assignment, quizzes, and case study report and presentation. They are aimed at evaluating the progress of students' study, assisting them in self-monitoring of fulfilling the respective subject learning outcomes, and enhancing the integration of the knowledge learnt.

The examination is used to assess the knowledge acquired by the students for understanding and analyzing the problems critically and independently; as well as to determine the degree of achieving the subject learning outcomes

Student Study Effort Expected

Class contact:	
▪ Lecture/Tutorial	27 Hours
▪ Workshop	6 Hours
▪ Presentation	6 Hours
Other student study effort:	
▪ Self study	44 Hours
▪ Case study	22 Hours
Total student study effort:	**105 Hours**

Reading List and References	1. B. Williams and S. Sawyer, *Using Information Technology: A Practical Introduction to Computers and Communications*, 10th ed. McGraw-Hill, 2013. 2. J.F. Kurose & K.W. Ross, *Computer Networking: A Top-Down Approach Featuring the Internet*, 5th edition, Addison-Wesley, 2009. 3. Carlos Coronel & Steven Morris, *Database Systems: Design, Implementation, & Management* 12th Edition, Course Technology, 2016 4. Helfrick A, *Principles of Avionics*, 7th ed., Avionics Communications, 2012.
Last Updated	July 2017
Prepared by	Dr Pauli Lai

Subject Description Form

Subject Code	ELC3521
Subject Title	Professional Communication in English
Credit Value	2
Level	3
Pre-requisite / Co-requisite	English LCR subjects
Objectives	This subject aims to develop the language competence for professional communication in English required by students to communicate effectively with various parties and stakeholders in regard to engineering-related project proposals.
Intended Learning Outcomes	Upon completion of the subject, and in relation to effective communication with a variety of intended readers/audiences in English, students will be able to: a. plan, organise and produce professionally acceptable project proposals with appropriate text structures and language for different intended readers b. plan, organise and deliver effective project-related oral presentations with appropriate interactive strategies and language for different intended audiences c. adjust the style of expression and interactive strategies in writing and speaking in accordance with different intended readers/audiences
Subject Synopsis / Indicative Syllabus	1. Project proposal in English • Planning and organising a project proposal • Explaining the background, rationale, objectives, scope and significance of a project • Referring to the current situation or existing literature to substantiate a project proposal • Describing the methods of study • Describing and discussing anticipated project results and (if applicable) results of a pilot study • Presenting the budget, schedule and (if applicable) method of evaluation • Writing an executive summary 2. Oral presentation of project proposal in English • Selecting content for an audience-focused presentation • Choosing language and style appropriate to the intended audience

	• Using appropriate transitions and maintaining coherence in a team presentation • Using effective verbal and non-verbal interactive strategies
Teaching/Learning Methodology	The subject is designed to develop the English language skills, both oral and written, that students need to use to communicate effectively and professionally with a variety of stakeholders of engineering-related projects. It builds upon the language and communication skills covered in GUR language training subjects. The study approach is primarily seminar-based. Seminar activities include instructor input as well as individual and group work, involving drafting and evaluating texts, mini-presentations, discussions and simulations. The learning and teaching activities in the subject will focus on a course-long project which will engage students in proposing and reporting on an engineering-related project to different intended readers/audiences. During the course, students will be involved in: • planning and researching the project • writing project-related documents such as project proposals • giving oral presentations to intended stakeholders of the project

Assessment Methods in Alignment with Intended Learning Outcomes

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)					
		a	b	c			
1. Project proposal in English	40%	✓		✓			
2. Oral presentation of project proposal in English	60%		✓	✓			
Total	100%						

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

The assessments will arise from a course-long engineering-related project. Students will collaborate in groups in planning, researching, discussing and giving oral presentations on the project. They will be assessed on written documents and oral presentations targeted at different intended readers/audiences. This facilitates assessment of students' ability to select content and use language and style appropriate to the purposes and intended readers/audiences.

Assessment type	Intended readers/audience	Timing
1. Project proposal in English Each team writes a proposal of 2000-2500 words; and each member writes a report of 200-250 words explaining his/her contribution to the project	Mainly engineering experts	Week 8
2. Oral presentation of project proposal in English Each team delivers a speech (30 minutes for a team of four), simulating a presentation of the final proposal	Mainly non-experts	Weeks 12-13

Student Study Effort Expected	Class contact:	
	Seminars	26 Hrs.
	Other student study effort:	
	Researching, planning and writing the project Rehearsing the presentation	52 Hrs.
	Total student study effort:	78 Hrs.
Reading List and References	1. D.F. Beer, (Ed.), *Writing and speaking in the technology professions: A practical guide*, 2nd ed., Hoboken, NJ: Wiley, 2003. 2. R. Johnson-Sheehan, *Writing proposals*, 2nd ed., New York: Pearson/Longman, 2008. 3. S. Kuiper, *Contemporary business report writing*, 3rd ed., Cincinnati, OH: Thomson/South-Western, 2007. 4. M.S. Lawrence, *Writing as a thinking process: Teacher's manual*. Ann Arbor, Mich: University of Michigan Press, 1975. 5. D.C. Reep, *Technical writing: Principles, strategies and readings*, 6th ed., Pearson, Longman, 2006.	

Subject Description Form

Subject Code	ENG3004
Subject Title	Society and the Engineer
Credit Value	3
Level	3
Pre-requisite/Co-requisite/Exclusion	Nil
Objectives	This subject is designed for engineering students as a complementary subject on the role of the professional engineer in practice and their responsibilities toward the profession, colleagues, employers, clients, and the public. The objectives of the subject are to enable students to 1. appreciate the historical context of modern technology and the nature of the process whereby technology develops and the relationship between technology and the environment, as well as the implied social costs and benefits; 2. understand the social, political, legal, and economic responsibilities and accountability of the engineering profession and the organizational activities of professional engineering institutions; 3. be aware of the short-term and long-term effects related to safety and health, and the environmental impacts of technology; 4. observe professional conduct, as well as the legal and other applicable constraints, related to various engineering issues; and 5. develop a strong vision to optimize their contribution to sustainable development.
Intended Learning Outcomes	Upon completion of the subject, students will be able to a. identify and evaluate the effects of technology as it applies to the social, cultural, economic, legal, health, safety, and environmental dimensions of society; b. explain the importance of local and international professional training, professional conduct and ethics, and responsibilities in various engineering disciplines, particularly the Washington Accord; c. evaluate and estimate, in a team setting, the impact of contemporary issues, planned projects, and unforeseen technological advances related to engineers; effectively communicate and present the findings to laymen and peers.
Subject Synopsis/ Indicative Syllabus	1. <u>Impact of Technology on Society</u> Historical cases and trends of technological innovation explored through their impact on social and cultural developments of

	civilization and their commonalities. 2. <u>Environmental Protection and Related Issues</u> Roles of the engineer in energy conservation, ecological balance, and sustainable development. 3. <u>Global Outlook for Hong Kong's Economy and Industries</u> Support organizations, policies and their impacts on industrial and economic development in Greater China, the Pacific Rim, and the world. 4. <u>Regulatory Organizations and Compliance</u> Discussion of engineer's responsibilities within different regulatory frameworks and environments; Examples from various entities such as the Labour Department and the Occupational Health and Safety Council; Legal dimensions to engineering such as liability, contract law, and industrial legislation. 5. <u>Professional Institutions</u> Local and overseas professional institutions; Washington Accord and the qualifications and criteria of professional engineers. 6. <u>Professional Ethics</u> Prevention of bribery and corruption; The work of the Independent Commission Against Corruption (ICAC); Social responsibilities of engineers.
Teaching/Learning Methodology	Class comprises short lectures to provide essential knowledge and information on the relationships between society and the engineer under a range of dimensions. Other methods include discussions, case studies, and seminars to develop students' in-depth analysis of the relationships. Students are assembled into groups; throughout the course, they will work on engineering cases by completing the following learning activities: 1. Case analysis where students explore the relationships between society and the engineering issues of a project under specific dimensions; 2. Construction and assembly of a case portfolio which includes i. Presentation slides ii. Feedback critiques iii. Weekly summary reports iv. A report on Sustainable Development v. Individual Reflections

<table>
<tr><td></td><td>3. Final oral presentation</td></tr>
<tr><td>Assessment Methods in Alignment with Intended Learning Outcomes</td><td>
<table>
<tr><td rowspan="2">Specific assessment methods/tasks</td><td rowspan="2">% weighting</td><td colspan="3">Intended subject learning outcomes to be assessed</td></tr>
<tr><td>a</td><td>b</td><td>c</td></tr>
<tr><td>1. Continuous assessment</td><td>60%</td><td></td><td></td><td></td></tr>
<tr><td>• Group weekly learning activities
• Individual final presentation
• Group project report, SD report, individual reflection report</td><td>(24%)
(18%)
(18%)</td><td>✓
✓
✓</td><td>✓
✓
✓</td><td>✓

✓</td></tr>
<tr><td>2. Examination</td><td>40%</td><td>✓</td><td>✓</td><td></td></tr>
<tr><td>Total</td><td>100%</td><td colspan="3"></td></tr>
</table>
Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

The coursework requires students to work in groups to study cases from the perspectives of the eight dimensions in an engineering setting. Through these exercises, students' ability to apply and synthesize acquired knowledge can be assessed on the basis of their performance in group discussion, oral presentations, and the quality of their portfolio reports on the case studies.

The open-book examination is used to assess students' critical thinking and problem-solving skills when working on their own.
</td></tr>
<tr><td>Student Study Effort Expected</td><td>
<table>
<tr><td>Class contact:</td><td></td></tr>
<tr><td>▪ Lectures and review</td><td>27 Hrs.</td></tr>
<tr><td>▪ Tutorial and presentation</td><td>12 Hrs.</td></tr>
<tr><td>Other student study efforts:</td><td></td></tr>
<tr><td>▪ Research and preparation</td><td>63 Hrs.</td></tr>
<tr><td>▪ Report writing</td><td>14 Hrs.</td></tr>
<tr><td>Total student study effort</td><td>116 Hrs.</td></tr>
</table>
</td></tr>
<tr><td>Reading List and References</td><td>Reference Books & Articles:
1. Education for Sustainable Development - An Expert Review of Processes and Learning, UNESCO, 2011
2. Engineering-Issues, Challenges and Opportunities for Development, USECO, 2010
</td></tr>
</table>

	3. Engineering for Sustainable Development: Guiding Principles, Royal Academy of Engineering, 2005 4. Securing the future: delivering UK sustainable development strategy, 2005 5. Johnston, F S, Gostelow, J P, and King, W J, 2000, *Engineering and Society Challenges of Professional Practice*, Upper Saddle River, N.J.: Prentice Hall 6. Hjorth, L, Eichler, B, and Khan, A, 2003, *Technology and Society A Bridge to the 21st Century*, Upper Saddle River, N.J.:Prentice Hall 7. The Council for Sustainable Development in Hong Kong, http://www.enb.gov.hk/en/susdev/council/ 8. Poverty alleviation: the role of the engineer, http://publications.arup.com/publications/p/poverty_alleviation_the_role_of_the_engineer **Reading materials:** Engineering journals: - Engineers by The Hong Kong Institution of Engineers - Engineering and Technology by The Institution of Engineers and Technology Magazines: Time, Far East Economic Review Current newspapers: South China Morning Post, China Daily, Ming Pao Daily

(revised) July 2017

Subject Description Form

Subject Code	ENG4001
Subject Title	Project Management
Credit Value	3
Level	4
Pre-requisite/Co-requisite/Exclusion	Nil
Objectives	This subject provides students with knowledge in: 1. project management tools in business organizations, taking into account the time-cost relationships, resources, processes, risks, the project life cycle, organization, and management principles; 2. project management methodologies and their application; 3. choosing project variables for effective project management; and 4. various developments of project management.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a. demonstrate good understanding of definition of a project, the characteristics and project life cycle; b. identify appropriate project variables and practices that are applicable to engineering projects; c. perform project planning, cost/resources estimation, evaluate and monitor of project progress; and d. propose project management solutions, taking into consideration the project objectives and constraints.
Subject Synopsis/ Indicative Syllabus	1. <u>Project Overview, Management Principles, and the Systems Approach</u> Characteristics of projects and project management. Management principles. Project organization. Team development. Systems concepts and principles. Conflict management. 2. <u>Project Methodologies and Planning Techniques</u> Constraints: time, cost, and technical performance. Work breakdown structure. Management of scope. Scheduling tools: Gantt charts, network analysis techniques, time-phased networks, CPA, PERT, and resource smoothing. 3. <u>Cost Estimation and Cost Control for Projects</u> Types of estimates. Budgeting project costs. Experience curve. Cost schedules and forecasts. Cost control systems. 4. <u>Evaluation and Control of Projects</u> Earned value measurement system. Managing project risks. Status reporting. Project closeout and termination.

<table>
<tr><td>Teaching/Learning Methodology</td><td>A mixture of lectures, tutorial exercises, case studies, and laboratory work are used to deliver the various topics in this subject. Some material is covered using a problem-based format where this advances the learning objectives. Other material is covered through directed study to enhance the students' "learning to learn" ability. Some case studies are from best practices of projects, based on a literature review. They are used to integrate the topics and demonstrate to students how the various techniques are interrelated and applied in real-life situations.</td></tr>
<tr><td>Assessment Methods in Alignment with Intended Learning Outcomes</td><td>
<table>
<tr><td rowspan="2">Specific assessment methods/tasks</td><td rowspan="2">% weighting</td><td colspan="4">Intended subject learning outcomes to be assessed</td></tr>
<tr><td>a</td><td>b</td><td>c</td><td>d</td></tr>
<tr><td>1. Tutorial exercises/ written report</td><td>20%</td><td></td><td>✓</td><td>✓</td><td></td></tr>
<tr><td>2. Mid Term Test</td><td>20%</td><td>✓</td><td>✓</td><td>✓</td><td></td></tr>
<tr><td>3. Written examination</td><td>60%</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr>
<tr><td>Total</td><td>100%</td><td colspan="4"></td></tr>
</table>
Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

Continuous assessment (1) & (2): Test, written reports and tutorial exercises are used to assess students' understanding and application of the knowledge that they have learnt relative to learning outcomes (a), (b) and (c).

Written examination: questions are designed to assess learning outcomes (a), (b), (c), and (d).
</td></tr>
<tr><td>Student Study Effort Expected</td><td>
<table>
<tr><td>Class contact:</td><td></td></tr>
<tr><td>▪ Lectures 3 hours/week for 9 weeks</td><td>27 Hrs.</td></tr>
<tr><td>▪ Tutorials / Case studies 3 hours/week for 4 weeks</td><td>12 Hrs.</td></tr>
<tr><td></td><td>39 Hrs.</td></tr>
<tr><td></td><td></td></tr>
<tr><td>Other student study effort:</td><td></td></tr>
<tr><td>▪ Preparation for assignments, short tests, and the written examination</td><td>79 Hrs.</td></tr>
<tr><td>Total student study effort</td><td>118 Hrs.</td></tr>
</table>
</td></tr>
</table>

Reading List and References	1. Meredith JR and Mantel SJ, 2010, *Project Management: a Managerial Approach*, Wiley, Hoboken NJ 2. Kerzner, H 2009, *Project Management: a Systems Approach to Planning, Scheduling, and Controlling*, John Wiley, New York 3. Smith, NJ (ed.) 2008, *Engineering Project Management*, Blackwell, Oxford

(Revised) July 2015

Subject Description Form

Subject Code	ISE3009
Subject Title	Aviation Safety and Reliability
Credit Value	3
Level	3
Pre-requisite/Co-requisite/Exclusion	Nil
Objectives	To provide students fundamental knowledge of aviation safety and to develop students' understanding of methods and techniques used in evaluating the reliability and safety of aviation systems.
Intended Learning Outcomes	Upon completion of the subject, students will be able to a. identify major causes (such as human errors) of aviation accidents and responsibilities of civil aviation regulatory bodies; b. develop a system monitoring programme in accordance with the recommended procedure of HK Civil Aviation Department; c. explain the mathematical concepts used in reliability and safety analysis of aviation systems; d. formulate system reliability assessment to demonstrate compliance with airworthiness requirements.
Subject Synopsis/ Indicative Syllabus	***Aviation Accidents –*** Worldwide commercial aircraft accidents and their causes. Responsibilities of civil aviation regulatory bodies – HK Civil Aviation Department (HK CAD), Civil Aviation Administration of China, Federal Aviation Administration, Civil Aviation Authority, European Aviation Safety Agency. Safety Management System (SMS). ***Aviation Reporting systems*** – Legal framework. Reporting organizations. Occurrence Reporting. ICAO Accident/Incident Reporting System. Aviation Safety Reporting System. National Transportation Safety Board. ***Human Errors –*** Human errors as a major contributor to aircraft accidents worldwide. Organizational factors related to flight crew and maintenance errors in commercial aircraft accidents. Pilot-controller communication errors. ***Mathematical Concepts*** – Properties of continuous and discrete random variables. Parameter estimation of reliability distributions. Failure rates. Mean time between failures. Series and parallel redundancy. Conditional probabilities. Weibull analysis. ***Reliability Assessment in Aircraft Systems –*** Design safety margins. System redundancy. FAA Fail-safe design concept. Probability and consequence of aviation failure conditions. Means for compliance with aircraft certification requirements.

<table>
<tr><td></td><td>Performance Monitoring – Safety Management Systems (SMS). Engineering performance of aircraft systems and components. Engine unscheduled shutdown. In-flight defects. Component unscheduled removals. Mechanical delays and cancellations. Statistical reliability measurement and HK CAD recommended alert establishment procedure.</td></tr>
<tr><td>Teaching/Learning Methodology</td><td>Lectures are used to deliver the fundamental knowledge in relation to various aspects of aviation system safety and reliability (outcomes a to d).

Tutorials are used to illustrate the application of fundamental knowledge to practical situations (outcomes a to d).

Group mini-projects are used to help students to deepen their knowledge on a specific topic through search of information, analysis of data and report writing (outcomes a to c).

Special seminar(s) delivered by invited industrial professionals may be used to relate the concepts learnt in class to engineering practices. Students are expected to achieve better understanding of aviation safety through this activity (outcomes a to d).

<table>
<tr><td rowspan="2">Teaching/Learning Methodology</td><td colspan="6">Outcomes</td></tr>
<tr><td>a</td><td>b</td><td>c</td><td>d</td><td></td><td></td></tr>
<tr><td>Lecture</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td><td></td><td></td></tr>
<tr><td>Tutorial</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td><td></td><td></td></tr>
<tr><td>Mini-project</td><td>✓</td><td>✓</td><td></td><td></td><td></td><td></td></tr>
<tr><td>Special seminar</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td><td></td><td></td></tr>
</table>
</td></tr>
<tr><td>Assessment Methods in Alignment with Intended Learning Outcomes</td><td>
<table>
<tr><td rowspan="2">Specific assessment methods/tasks</td><td rowspan="2">% weighting</td><td colspan="6">Intended subject learning outcomes to be assessed</td></tr>
<tr><td>a</td><td>b</td><td>c</td><td>d</td><td></td><td></td></tr>
<tr><td>1. Assignments</td><td>20%</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td><td></td><td></td></tr>
<tr><td>2. Group mini-project</td><td>10%</td><td>✓</td><td>✓</td><td></td><td></td><td></td><td></td></tr>
<tr><td>3. Tests</td><td>20%</td><td>✓</td><td>✓</td><td></td><td>✓</td><td></td><td></td></tr>
<tr><td>4. Examination</td><td>50%</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td><td></td><td></td></tr>
<tr><td>Total</td><td>100%</td><td colspan="6"></td></tr>
</table>
Explanation of the appropriateness of the assessment methods in</td></tr>
</table>

	assessing the intended learning outcomes: Overall Assessment: 0.50 × End of Subject Examination + 0.50 × Continuous Assessment Examination is adopted to assess students on the overall understanding and the ability of applying the concepts. It is supplemented by continuous assessment including assignments, group mini-project, and test. The continuous assessment is aimed at enhancing the students' comprehension and assimilation of various topics of the syllabus. In particular, group mini-project is used to assess the students' capacities of self-learning and problem-solving and effective communication skill in English so as to fulfill the requirements of working in the aviation industry.	
Student Study Effort Required	Class contact:	
	▪ Lecture	30 Hrs.
	▪ Tutorial	9 Hrs.
	Other student study effort:	
	▪ Course work	20 Hrs.
	▪ Self-study	51 Hrs.
	Total student study effort	110 Hrs.

Reading List and References	1. Rodrigues, Clarence C. and Cusick, Stephen K., *Commercial Aviation Safety*, 5th edition, 2012, McGraw-Hill 2. Dhillon, B.S., *Safety and Human Error in Engineering Systems*, 2012, CRC Press 3. O'Connor, Patrick D.T. and Kleyner, Andre, *Practical Reliability Engineering*, 5th edition, 2011, Wiley 4. *International Journal of Reliability, Quality and Safety Engineering*

7.1.2016

Subject Description Form

Subject Code	ISE4014
Subject Title	Aircraft Service Engineering and Logistics
Credit Value	3
Level	4
Pre-requisite/Co-requisite/Exclusion	Nil
Objectives	This subject will enable students to 1. estimate failure rate of aircrafts; 2. evaluate aircraft reliability; 3. schedule an optimal maintenance plan for aircrafts; 4. maintain fleet readiness; 5. apply principles of quality assurance, quality control, and reliability standards for aircraft services.
Intended Learning Outcomes	Upon completion of the subject, students will be able to a. understand and apply different methodologies in aircraft maintenance, such as condition monitored, on-condition and scheduled maintenance process; b. understand and apply different scheduling methodologies to plan and design fleet aircraft maintenance schedule to maximize aircraft reliability and availability.
Subject Synopsis/ Indicative Syllabus	1. <u>Fundamentals of Maintenance</u> Aircraft Reliability; Types of Maintenance; Failure Rate Patterns; Aircraft Ageing; Technology in Aircraft Maintenance. 2. <u>Development of Maintenance Program</u> Process-Oriented Maintenance; Task-Oriented Maintenance; Maintenance Program Documents; Line Maintenance Operations and Schedule; Aircraft Logbook. 3. <u>Aircraft Maintenance Management</u> Role of Management in Aviation; Aircraft Maintenance Management Structure; Aircraft Maintenance Planning and Scheduling; Management Area of Concerns in an Airline; Cost of aircraft maintenance; Implementing Human Factors in Maintenance. 4. <u>Aviation Industry Certification Requirements</u> Aircraft Maintenance Engineer; Aircraft certification; Delivery

<table>
<tr><td></td><td>Inspection; Operator certification; Certification of Personnel; Aviation Maintenance certification; JAA joint certifications; National certifications; FAA type certification.</td></tr>
<tr><td>Teaching/Learning Methodology</td><td>A mixture of lectures, tutorials, and projects are used to deliver the various topics in this subject. Some materials are covered in a problem-based format, exercise, and assignments to enhance learning effectiveness. Others will be covered through directed study in order to enhance the students' ability of "learning to learn." Some case studies, mainly based on business and industrial experience, are used to integrate these topics and thereby demonstrate to students how the various principles and techniques are inter-related and how they apply in real-life situations.</td></tr>
<tr><td>Assessment Methods in Alignment with Intended Learning Outcomes</td><td>
<table>
<tr><td rowspan="2">Specific assessment methods/tasks</td><td rowspan="2">% weighting</td><td colspan="6">Intended subject learning outcomes to be assessed</td></tr>
<tr><td>a</td><td>b</td><td></td><td></td><td></td><td></td></tr>
<tr><td>1. Laboratory work</td><td>10%</td><td>✓</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>2.In-class Assignment</td><td>10%</td><td></td><td>✓</td><td></td><td></td><td></td><td></td></tr>
<tr><td>3. Individual Assignment</td><td>20%</td><td></td><td>✓</td><td></td><td></td><td></td><td></td></tr>
<tr><td>4. Group Project</td><td>30%</td><td>✓</td><td>✓</td><td></td><td></td><td></td><td></td></tr>
<tr><td>5. Test</td><td>30%</td><td>✓</td><td>✓</td><td></td><td></td><td></td><td></td></tr>
<tr><td>Total</td><td>100%</td><td colspan="6"></td></tr>
</table>
The assignments are designed to assess students' understanding about the knowledge of aircraft maintenance and certifications.
The tutorials and exercises are designed to assess students' understanding of analyzing reliability and failure rate patterns.
The projects and case studies are designed to assess students' understanding of the working principles in the development of maintenance program and management.
The test is designed to assess students' understanding of the topics and whether they can present the concepts clearly.
</td></tr>
</table>

Student Study Effort Expected	Class contact:	
	▪ Lectures	21 Hrs.
	▪ Tutorials	18 Hrs.
	Other student study effort:	
	▪ Assignments and exercises	25 Hrs.
	▪ Self-learning and practice for projects	30 Hrs.
	▪ Test preparations	25 Hrs.
	Total student study effort	119 Hrs.
Reading List and References	1. Kinnison, Harry A. 2013, *Aviation Maintenance Management*, McGraw-Hill 2. Friend, C.H. 1992, *Aircraft Maintenance Management*, Longman 3. Florio, Fillppo De 2006, *Airworthiness An Introduction to Aircraft Certification*, A Guide to Understanding JAA, EASA, and FAA Standards 4. Kroe, Micheal J., Watkins, William A., and Delp, Frank 2013, *Aircraft Maintenance and Repair*, Seventh Edition, McGraw-Hill Professional 5. Salas, Eduardo, Jentsch, Florian, and Maurino, Dan 2010, *Human Factors in Aviation*, Academic Press	

24.5.2016

Subject Description Form

Subject Code	ISE4015
Subject Title	Airport Logistics Engineering
Credit Value	3
Level	4
Pre-requisite/Co-requisite/Exclusion	Nil
Objectives	This subject provides students with 1. understanding in aviation logistics and transportation engineering; 2. ability to conduct analytical investigations on aviation logistics operations; 3. basic engineering techniques in logistics applications.
Intended Learning Outcomes	Upon completion of the subject, students will be able to a. understand the aviation industry and to design/select appropriate facilities to facilitate logistics operations; b. apply appropriate techniques to assist aviation industry; c. use RFID/barcode systems, and engineering techniques to improve logistics functions.
Subject Synopsis/ Indicative Syllabus	1. <u>Overview of Aviation Logistics</u> Introduction to Aviation Operations; Aviation Maintenance Optimization; Air Cargo Planning (Optimization); Shortest Path Algorithms (Dijkstra's/Floyd's algorithms). 2. <u>Warehousing and Logistics Equipment Selection</u> Warehouse Layout/Design; Capacity Planning; Honeycomb Loss; Warehouse operations (Inventory models, Storage assignment, Order Picking Policies); Automated Storage and Retrieval Systems (ASRS); Equipment Selection; Simple Conveyor and Closed-loop Conveyor Analysis. 3. <u>System Control and Automation</u> Radio Frequent Identification (RFID) and Barcode Systems, Introduction to Precise Asset Location Systems; Utilizations of programmable control devices; Sensors/actuators Applications and Basic Programming.

<table>
<tr><td>Teaching/Learning Methodology</td><td>Teaching is conducted through a series of class lectures, tutorials, and case studies/laboratory exercises. Both engineering techniques and theoretical knowhow in relation to logistics with particular emphasis on aviation sectors are introduced. Normally, the essential knowledge is taught in class and laboratory exercises are given to develop a student’s practical ability. Examination is required in this subject, and laboratory exercises contribute to the course work marks.</td></tr>
<tr><td>Assessment Methods in Alignment with Intended Learning Outcomes</td><td>
<table>
<tr><td rowspan="2">Specific assessment methods/tasks</td><td rowspan="2">% weighting</td><td colspan="6">Intended subject learning outcomes to be assessed</td></tr>
<tr><td>a</td><td>b</td><td>c</td><td></td><td></td><td></td></tr>
<tr><td>1. Laboratory Exercise</td><td>30%</td><td>✓</td><td>✓</td><td>✓</td><td></td><td></td><td></td></tr>
<tr><td>2. Examination</td><td>70%</td><td>✓</td><td>✓</td><td></td><td></td><td></td><td></td></tr>
<tr><td>Total</td><td>100%</td><td colspan="6"></td></tr>
</table>
This subject covers both optimization and engineering techniques. There are five laboratory exercises: three are designed to assess part of learning outcomes a and b that involve the use of software tools to assist the problem solving, and other two laboratories are for c that it requires the support of engineering hardware/software. At the end of the subject, an examination is given to students to assess learning outcomes a and b but not for c because it is not so appropriate to be assessed by a written examination due to the practical engineering nature.
</td></tr>
<tr><td>Student Study Effort Expected</td><td>
<table>
<tr><td>Class contact:</td><td></td></tr>
<tr><td>▪ Lecture/Seminar 2 hours/week for 10 weeks</td><td>20 Hrs.</td></tr>
<tr><td>▪ Tutorial 2 hour/week for 2 weeks</td><td>4 Hrs.</td></tr>
<tr><td>▪ Laboratory/Case study 3 hours/week for 5 weeks</td><td>15 Hrs.</td></tr>
<tr><td>Other student study efforts:</td><td></td></tr>
<tr><td>▪ Assignment</td><td>35 Hrs.</td></tr>
<tr><td>▪ Self-study/Preparation work of both examination and laboratory exercises</td><td>48 Hrs.</td></tr>
<tr><td>Total student study effort</td><td>122 Hrs.</td></tr>
</table>
</td></tr>
</table>

Reading List and References	1. Simchi-Levi, D, Chen, X & Bramel, J 2010, *The Logic of Logistics: Theory, Algorithms, and Applications for Logistics and Supply Chain Management*, Springer-Verlag 2. Taylor, G D 2007, *Logistics Engineering Handbook*, CRC Press 3. Sule, D R 2001, *Logistics of Facility Location and Allocation*, CRC Press 4. Maher, L 2007, *Facility Logistics: Approaches and Solutions to Next Generation Challenges*, Auerbach Publications 5. Sule, D R 2008, *Manufacturing Facilities: Location, Planning, and Design*, Taylor & Francis 6. Daskin, M S 2013, *Network and Discrete Location: Models Algorithms, and Applications*, Wiley 7. Shetty, D & Kolk, R A 2010, *Mechatronics System Design: SI*, Cengage Learning 8. Travis, J & Kring, J 2006, *LabVIEW for Everyone: Graphical Programming Made Even Easier and Fun(3rd Edition)*, Prentice Hall

6.6.2016

Subject Description Form

Subject Code	ME37001
Subject Title	Fundamentals of Aerodynamics
Credit Value	3
Level	3
Pre-requisite / Co-requisite/ Exclusion	Pre-Requisite: AMA2111 Mathematics I
Objectives	1. To develop students' knowledge in the fundamentals of aerodynamics. 2. To provide student's insight on airflow characteristics flowing through the aircraft. 3. To develop the students' capability in designing aerofoil with the consideration of different wind factors.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a. obtain fundamental knowledge in the area of aerodynamics primarily in inviscid and incompressible flow with viscous effect confined to boundary layers; b. apply their knowledge, skills and hand-on experience to the analysis of aerodynamics, lift and drag on simple geometries and thin airfoils; c. extend their knowledge of mechanical engineering to different situations of engineering context and professional practice in aerodynamics; and d. recognize the need for and an ability to engage in life-long learning.
Subject Synopsis/ Indicative Syllabus	***Introduction to Aerodynamics*** **-** aerodynamics variables, forces and moments; fluid statics; dimensional analysis and flow similarity; types of flow – continuum versus free molecule flow, inviscid versus viscous flow, incompressible versus compressible flow, Mach number flow regimes; an introduction to viscous boundary layers ***Fundamental Principles and Conservative Equations*** **-** control volume; continuity, momentum and energy equations; pathlines, streamlines, and streaklines of a flow; angular velocity, vorticity and strain; circulation; stream function and velocity potential. ***Inviscid, Incompressible Flow*** **-** Bernoulli equation; flow in a duct – venturi and low-speed wind tunnel; pitot tube measurement of airspeed; irrotational flow, Laplace equation and

<table>
<tr><td></td><td>elementary solutions – uniform flow, source, sink, doublet, non-lifting and lifting flow over cylinder, vortex flow; Kutta-Joukowski theorem on circulation and lift.

Incompressible Flow over Airfoils - Airfoil nomenclature and characteristics; Kutta condition; circulation and lift; Kelvin circulation theorem and starting vortex; thin airfoil theory; viscous airfoil drag.

Incompressible Flow over Finite Wings - downwash and induced drag; vortex system on finite wing; law on vortex motion; Prantdl's lifting line theory.

Introduction to Compressible Flow - compressibility effects; elementary 1D compressible flow, shocks, expansion wave.</td></tr>
<tr><td>Teaching/Learning Methodology</td><td>1. The teaching and learning methods include lectures, homework assignments, test, and examination.

2. The continuous assessment and examination are aimed at providing students with integrated knowledge required for aerodynamics.

3. Technical/practical examples and problems are raised and discussed in class.

4. Experiments or CFD projects are used to evaluate the lift and drag of streamline objects and airfoils.

<table>
<tr><td rowspan="2">Teaching/Learning Methodology</td><td colspan="4">Outcomes</td></tr>
<tr><td>a</td><td>b</td><td>c</td><td>d</td></tr>
<tr><td>Lectures</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr>
<tr><td>Homework assignments</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr>
<tr><td>Tests</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr>
<tr><td>Exam</td><td>✓</td><td>✓</td><td>✓</td><td></td></tr>
</table>
</td></tr>
</table>

Assessment Methods in Alignment with Intended Learning Outcomes

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed			
		a	b	c	d
1. Homework assignments	10%	✓	✓	✓	✓
2. Tests	25%	✓	✓	✓	✓
3. Experiments/Projects	15%	✓	✓	✓	✓
4. Examination	50%	✓	✓	✓	
Total	100%				

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

1. The assessment is comprised of 50% continuous assessment (homework, experiments/projects) and 50% examination.

2. The continuous assessment consists of homework assignments. They are aimed at evaluating the progress of students study, assisting them in self-monitoring of fulfilling the respective subject learning outcomes, and enhancing the integration of the knowledge learnt.

3. The examination is used to assess the knowledge acquired by the students for understanding and analyzing the problems critically and independently; as well as to determine the degree of achieving the subject learning outcomes.

Student Study Effort Expected

Class contact:	
▪ Lecture	33 Hrs.
▪ Lab/Project	6 Hrs.
Other student study effort:	
▪ Self Study	67 Hrs.
Total student study effort	106 Hrs.

Reading List and References

1. Anderson J. D., *Fundamentals of Aerodynamics*. McGraw-Hill, latest edition.
2. Kuethe A. M., Chow C-Y, *Fundamentals of Aerodynamics: Bases of Aerodynamic Design*, John Wiley & Sons, Inc., latest edition.

July 2016

Subject Description Form

Subject Code	ME37002
Subject Title	Aircraft Structures and Materials
Credit Value	3
Level	3
Pre-requisite / Co-requisite/ Exclusion	Pre-requisite: ENG2001 Fundamentals of Materials Science and Engineering; and ME23001 Engineering Mechanics
Objectives	1. To provide students key knowledge relevant to aircraft structures and materials; 2. To provide students an overview of the composites used in modern aircraft; 3. To provide students with stress analysis tools to formulate and solve engineering problems related to aircraft structures and materials.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a. demonstrate a good understanding of key aspects of aircraft structures; b. analyze and assess aircraft structures subject to various types of loading using stress analysis tools and failure criteria; c. comprehend characteristics of various materials used in aircraft; d. understand mechanical behaviors of composite materials used in aircraft.
Subject Synopsis/ Indicative Syllabus	***Characteristics of Aircraft Structures -*** Aircraft structural elements. Wing, fuselage, tail and landing gear. ***Fundamentals of Aircraft Materials and Joints -*** Material fundamentals. Metallic alloys. Composites. Riveting. Aircraft fasteners. Adhesive joint. ***Stress Analysis -*** Stress and strain. Equations of equilibrium. Principal stresses. Linear stress-strain relations. ***Loads Applied on Aircraft -*** Compression and tension. Torsion. Bending. Membrane stresses in pressure vessels. Flexural shear in closed thin-walled sections. Buckling of columns. Loads and stresses on ribs and frames. Aircraft structures under combined loading.

<table>
<tr><td></td><td>

Failure Criteria for Isotropic Materials - Strength criteria for brittle materials. Yield criteria for ductile materials. Stress concentration. Fatigue. Fractures. Corrosion of materials and prevention.

Heat Treatment Processes - Heat treatment of metals. Surface treatment.

Fundamentals of Aircraft Composites - Mechanical behavior of composite materials. Processing and Fabrication techniques for aircraft composites.

</td></tr>
<tr><td>Teaching/Learning Methodology</td><td>

Lectures and tutorials are used to deliver the fundamental knowledge in relation to aircraft structures and materials (outcomes a to d).

<table>
<tr><td rowspan="2">Teaching/Learning Methodology</td><td colspan="4">Outcomes</td></tr>
<tr><td>a</td><td>b</td><td>c</td><td>d</td></tr>
<tr><td>Lectures</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr>
<tr><td>Tutorials</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr>
</table>

</td></tr>
<tr><td>Assessment Methods in Alignment with Intended Learning Outcomes</td><td>

<table>
<tr><td rowspan="2">Specific assessment methods/tasks</td><td rowspan="2">% weighting</td><td colspan="4">Intended subject learning outcomes to be assessed</td></tr>
<tr><td>a</td><td>b</td><td>c</td><td>d</td></tr>
<tr><td>1. Examination</td><td>60%</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr>
<tr><td>2. Assignments and quiz</td><td>30%</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr>
<tr><td>3. Laboratory</td><td>10%</td><td>✓</td><td>✓</td><td></td><td></td></tr>
<tr><td>Total</td><td>100 %</td><td colspan="4"></td></tr>
</table>

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

Overall Assessment:

0.6 × End of Subject Examination + 0.4 × Continuous Assessment

Examination is adopted to assess students on the overall understanding and the ability of applying the concepts. It is supplemented by the tests and assignments which provide timely feedbacks to both lecturers and students on various topics of the syllabus.

</td></tr>
</table>

Student Study Effort Expected	Class contact:	
	▪ Lecture	33 Hrs.
	▪ Tutorial	6 Hrs.
	Other student study effort:	
	▪ Self Study	45 Hrs.
	▪ Case study report preparation and presentation	21 Hrs.
	Total student study effort	105 Hrs.
Reading List and References	1. C.T. Sun, Mechanics of Aircraft Structures, John Wiley & Sons, latest edition. 2. T.H.G. Megson, Aircraft Structures for Engineering Students, Elsevier, latest edition. 3. R.F. Gibson, Principles of Composite Material Mechanics, McGraw-Hill International Editions, latest edition.	

July 2016

Subject Description Form

Subject Code	ME37003
Subject Title	Aircraft Propulsion Systems
Credit Value	3
Level	3
Pre-requisite / Co-requisite/ Exclusion	Pre-requisite: ME37001 Fundamentals of Aerodynamics
Objectives	To provide students with knowledge of advanced aerodynamics and application in modern gas-turbine engines.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a. obtain state-of-the-art knowledge in the area of aerodynamics and propulsion systems; b. apply their knowledge, skills and hand-on experience to the design and analysis of propulsion systems; c. extend their knowledge of mechanical engineering to different situations of engineering context and professional practice in propulsions systems; and d. recognize the need for and an ability to engage in life-long learning.
Subject Synopsis/ Indicative Syllabus	***Introduction to Propulsion*** **-** fluid momentum, reaction force, rockets, propellers, turbojets, turboprop, turbofans. ***Review of Thermo-fluids*** **-** mass, momentum and energy conservation laws; first and second laws; entropy equation; and perfect gas. ***Steady-state, One-dimensional (1D), Compressible Flow*** **-** Quasi-1D flow of perfect gas; isentropic and non-isentropic flow; constant area with friction and without friction with stagnation temperature variation; shocks; and expansion waves. ***Propulsion Basics*** **-** thrust equations, thermal and propulsion efficiencies, fuel consumption rate and specific thrust, aircraft range.

<table>
<tr><td></td><td>Cycle Analysis and Engine Performances - ramjet, turbojet, turbofan, turboprop, and turbo-shaft engines.

Turbomachinery - basics of compressors and turbines.

Related Topics - Inlets, nozzles, and combustors; engine performance and aircraft-engine matching.

Modern Aircraft Engines - High-by-pass engines, open rotor engines and green engines.</td></tr>
<tr><td>Teaching/Learning Methodology</td><td>1. The teaching and learning methods include lectures, homework assignments, test, and examination.

2. The continuous assessment and examination are aimed at providing students with integrated knowledge required for propulsion systems.

3. Technical/practical examples and problems are raised and discussed in class.

4. Experiments or CFD projects are designed to evaluate the propulsion system.

<table>
<tr><td rowspan="2">Teaching/Learning Methodology</td><td colspan="4">Outcomes</td></tr>
<tr><td>a</td><td>b</td><td>c</td><td>d</td></tr>
<tr><td>Lectures</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr>
<tr><td>Homework assignments</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr>
<tr><td>Experiments/Projects</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr>
<tr><td>Tests</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr>
<tr><td>Exam</td><td>✓</td><td>✓</td><td>✓</td><td></td></tr>
</table>
</td></tr>
</table>

Assessment Methods in Alignment with Intended Learning Outcomes

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed			
		a	b	c	d
1. Homework assignments	10%	✓	✓	✓	✓
2. Projects/Experiments	15%	✓	✓	✓	✓
3. Tests	25%	✓	✓	✓	✓
4. Examination	50%	✓	✓	✓	
Total	100%				

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

1. The assessment is comprised of 50% continuous assessment and 50% examination.

2. The continuous assessment consists of homework assignments. They are aimed at evaluating the progress of students study, assisting them in self-monitoring of fulfilling the respective subject learning outcomes, and enhancing the integration of the knowledge learnt.

3. The examination is used to assess the knowledge acquired by the students for understanding and analyzing the problems critically and independently; as well as to determine the degree of achieving the subject learning outcomes.

Student Study Effort Expected

Class contact:	
▪ Lecture	33 Hrs.
▪ Lab/Project	6 Hrs.
Other student study effort:	
▪ Self Study	67 Hrs.
Total student study effort	106 Hrs.

Reading List and References

1. Hill P. and Peterson C., *Mechanics and Thermodynamics of Propulsion*., Addison Wesley, Inc. latest edition.
2. Sutton G. P., Biblarz O., R*FRocket Prropulsion Elements*, John Wiley & Sons, Inc. latest edition.

Subject Description Form

Subject Code	ME37004
Subject Title	Flight Mechanics and Control
Credit Value	3
Level	3
Pre-requisite / Co-requisite/ Exclusion	Nil
Objectives	To provide students with a basic understanding of flight performance, static and dynamic stability and feedback control.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a. Formulate equations of motion of a rigid symmetric aircraft. b. Analyze equilibrium and stability for an aircraft. c. Explain the basic modes of motion and related mechanisms of an aircraft. d. Design a basic control system using simplified equations of motion.
Subject Synopsis/ Indicative Syllabus	***Introduction*** **–** Mathematical tools for flight mechanics and control, configuration aerodynamics, flight performance. ***Flight Dynamics*** **–** Aircraft equation of motion, static equilibrium and trim, lift and pitching moment, control force, static longitudinal and lateral stability, linearized equation of motion, longitudinal dynamics, lateral-directional dynamics, maneuvering flight. ***Flight Response*** **–** Transfer function and block diagram, open loop response, time response, frequency response, closed-loop control and stability, stability margins, Routh-Hurwitz stability criterion, root-locus analysis of parameter variations. ***Aerodynamic Stability and Control*** – Flying qualities requirements, stability and control derivatives, problems of longitudinal dynamics, problems of lateral-directional dynamics.
Teaching/Learning Methodology	Lectures aim at providing students with an integrated knowledge required for understanding aircraft performance, static stability, dynamic stability and feedback control. Theories and examples will be presented to cover the syllabus on general equation of motion for aircrafts, models of aircraft, and conditions for equilibrium, linearization and solution of equations of motion. This forms the basis for analysis of trajectories, modes of motion as well as control analysis and synthesis. Tutorials aim at enhancing the analytical skills of the students. Examples will be provided to teach students the skills of solving different flight

mechanics and control problems using the knowledge of dynamic system and feedback control techniques. Students will be able to solve real-life problems using the knowledge they acquired in the class.

Experiments will provide students with experience in simulating the aircraft motion and how its configuration affects stability and control. The students are motivated to make assumptions to simplify a flight mechanics problem which is analyzed by using MATLAB toolbox. These experiments are designed to train students how to apply theories to practical applications, how to analyze and present experimental data.

Teaching/Learning Methodology	Outcomes			
	a	b	c	d
1. Lecture	√	√	√	√
2. Laboratory				√
3. Tutorial	√	√	√	√

Assessment Methods in Alignment with Intended Learning Outcomes

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed			
		a	b	c	d
1. Test	20%	√	√	√	√
2. Homework assignment	20%	√	√	√	√
3. Laboratory	10%				√
4. Examination	50%	√	√	√	√
Total	100%				

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

Overall Assessment:

0.5 × End of Subject Examination + 0.5 × Continuous Assessment

Examination is adopted to assess students on the overall understanding and the ability to apply the concepts. It is supplemented by tests, assignments and laboratory reports which provided timely feedback to both lecturers and the students on various topics of the syllabus.

Student Study Effort Expected	Class contact:	
	▪ Lecture	35 Hrs.
	▪ Laboratory/Tutorial	4 Hrs.
	Other student study effort:	
	▪ Reading and review	42 Hrs.
	▪ Homework assignment	16 Hrs.
	▪ Laboratory report	8 Hrs.
	Total student study effort	105 Hrs.
Reading List and References	1. Cook, M. V., Flight Dynamics Principles, Elsevier, latest edition. 2. Etkin, B. and Reid, L. D., Dynamics of Flight, John Wiley, latest edition. 3. Yechout, T. R., Morris, S. L., Bossert, D. E., Hallgren, W. F., Introduction to Aircraft Flight Mechanics, AIAA, latest edition.	

March 2014

Subject Description Form

Subject Code	ME37010
Subject Title	Air Transport Operations
Credit Value	3
Level	3
Pre-requisite/ Co-requisite/ Exclusion	Nil
Objectives	To provide an overview of air transport operations to a diverse audience that has an interest in the development of careers in aviation and to develop students' understanding of the up-to-date operational concepts and practices.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a. understand key aviation systems and their roles; b. identify and explain mandatory airworthiness requirements; c. describe the aviation environmental impact and published mitigating measures; d. explain the roles of the International Civil Aviation Organization and the International Air Transport Association in fostering safe and efficient air transport.
Subject Synopsis/ Indicative Syllabus	***Aviation Systems*** **-** An introduction to major aviation systems - civil aviation regulatory bodies, airlines, airports and aviation organisations. Economic contributions of the aviation industry and related businesses. ***Airline Organization*** **-** Air Operator's Certificate. Route planning. Engineering operations. Flight operations. Take-off and landing minima. Reduced vertical separation minima. Aviation security training. ***Airport Operations*** **-** Overview of airport planning and operations. Passenger and cargo terminal operations. Maintenance of electrical, mechanical and electronic systems. Safety management on airport operations. Operation and development of airport facilities. Air traffic controls. Aviation security and Runway system design. ***Aviation and the Environment*** **-** Environmental impacts of aviation – aircraft emissions and noise. HK CAD noise abatement departure and noise mitigating measures. ***International Associations*** **-** International Civil Aviation Organization (ICAO). Airport Council International (ACI). International Air Transport Association (IATA).

Teaching/Learning Methodology

Lectures are used to deliver the fundamental knowledge in relation to various aspects of aviation systems (outcomes a to d).

Tutorials are used to illustrate the application of fundamental knowledge to practical situations (outcomes a to d).

Group mini-projects are used to help students to deepen their knowledge on a specific topic through search of information, analysis of data and report writing (outcomes a to d).

Special seminar(s) delivered by invited industrial professionals may be used to relate the concepts learnt in class to current engineering practices. Students are expected to achieve better understanding of aviation operations through this activities (outcomes a to d).

Teaching/Learning Methodology	Outcomes			
	a	b	c	d
Lecture	√	√	√	√
Tutorial	√	√	√	√
Mini-project	√	√	√	√
Seminar	√	√	√	√

Assessment Methods in Alignment with Intended Learning Outcomes

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed			
		a	b	c	d
1. Assignments	20%	√	√	√	√
2. Group mini-project	10%	√	√	√	√
3. Test	20%	√	√	√	√
4. Examination	50%	√	√	√	√
Total	100%				

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

Overall Assessment:

$0.50 \times$ End of Subject Examination + $0.50 \times$ Continuous Assessment

Examination is adopted to assess students on the overall understanding and the ability of applying the concepts. It is supplemented by continuous assessment including assignments, group mini-project, and test. The continuous assessment is aimed at enhancing the students' comprehension and assimilation of various topics of the syllabus. In particular, group mini-project is used to assess the students' capacities of self-learning and problem-solving and effective communication skill in English so as to fulfill the

	requirements of working in the aviation industry.	
Student Study Effort Expected	Class contact:	
	▪ Lecture	33 Hrs.
	▪ Tutorial	6 Hrs.
	Other student study effort:	
	▪ Course work	21 Hrs.
	▪ Self-study	45 Hrs.
	Total student study effort	105 Hrs.
Reading List and References	1. Richard De Neufville. Airport Systems: Planning, Design, and Management, McGraw-Hill, latest edition. 2. HK Government. Air Navigation (Hong Kong) Order, latest amendment. 3. HK CAD. Aeronautical Information Publication, latest update.	

March 2014

Subject Description Form

Subject Code	ME37011
Subject Title	Human Factors in Aviation
Credit Value	3
Level	3
Pre-requisite/ Co-requisite/ Exclusion	Nil
Objectives	To provide students with fundamental human factors concepts and develop students' understanding of the applied multi-disciplinary approach mostly concerned with the interaction of operating personnel with their working environments in the aviation industry.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a. explain the basic concepts of human factors(HF) in the aviation industry;. b. explain the application of ergonomics in flight deck design; c. identify and explain the human errors in airport operations, air traffic control, and aircraft maintenance.
Subject Synopsis/ Indicative Syllabus	***Basic Concepts –*** The meaning of human factors. The case for human factors in the aviation industry. Use of human factor models. ***Management and Organization*** – Evolution of aviation organizations as socio-technical systems. Safe and unsafe organizations. Management's contribution to safety. Safety culture. ***Flight Deck Design –*** Basic facts about ergonomics. Human capabilities. Displays, controls and design. The cockpit environment. Operational implications of automation in advanced technology flight decks. ***Human Factors in the Cockpit*** - Cockpit Resource Management (CRM). CRM training phases. Situation awareness. Practice and feedback. Reinforcement. Stress management. Training techniques. ***Human Factors in Airport Operations –*** Procedural compliance. Injury prevention. Fatigue management. Shift/task turnover. Event investigation. ***Human Factors in Air Traffic Control* (ATC) –** Evolution of ATC. Human factors within systems. The Controller's workspace. Automation in ATC. Implications of automation. Human-machine interface and human error. The ICAO concept on communications, navigation, surveillance and air traffic management. ***Human Factors in Aircraft Maintenance –*** Human factors issues affecting aircraft maintenance. Contemporary maintenance problems. Teams and organizational issues. Automation and advanced technology systems.

Teaching/Learning Methodology

Lectures are used to deliver the fundamental knowledge in relation to various aspects of aviation systems (outcomes a to c).

Tutorials are used to illustrate the application of fundamental knowledge to practical situations (outcomes a to c).

Group mini-projects are used to help students to deepen their knowledge on a specific topic through search of information, analysis of data and report writing (outcomes a to c).

Special seminar(s) delivered by invited industrial professionals may be used to relate the concepts learnt in class to engineering practices. Students are expected to achieve better understanding of human factors through this activity (outcome a).

Teaching/Learning Methodology	Outcomes		
	a	b	c
Lecture	√	√	√
Tutorial	√	√	√
Mini-project	√	√	√
Special seminar	√		

Assessment Methods in Alignment with Intended Learning Outcomes

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be asessed		
		a	b	c
1. Assignments	20%	√	√	√
2. Group mini-project	10%	√	√	√
3. Test	20%	√	√	√
4. Examination	50%	√	√	√
Total	100%			

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

Overall Assessment:

$0.50 \times$ End of Subject Examination + $0.50 \times$ Continuous Assessment

Examination is adopted to assess students on the overall understanding and the ability of applying the concepts. It is supplemented by continuous assessment including assignments, group mini-project, and test. The continuous assessment is aimed at enhancing the students' comprehension and assimilation of various topics of the syllabus. In particular, group mini-project is used to assess the students' capacities of self-learning and problem-solving and effective communication skill in English so as to fulfill the requirements

	of working in the aviation industry.	
Student Study Effort Expected	Class contact:	
	▪ Lecture	33 Hrs.
	▪ Tutorial	6 Hrs.
	Other student study effort:	
	▪ Course work	21 Hrs.
	▪ Self-study	45 Hrs.
	Total student study effort	105 Hrs.
Reading List and References	1. FAA (2007). *Operator's manual: Human factors in airport Operations*. 2. Reason J.T. & Hobbs, A.. Managing Maintenance Error:A Practical Guide. Ashgate, latest edition.	

March 2014

Subject Description Form

Subject Code	ME47010
Subject Title	Airworthiness
Credit Value	3
Level	4
Pre-requisite / Co-requisite/ Exclusion	Pre-requisite: AAE3005 Introduction to Aircraft Design and Aviation System; or ENG3005 Introduction to Aircraft Design and Aviation System; and ISE3009 Aviation Safety and Reliability
Objectives	This subject aims at providing students basic understanding of the aircraft airworthiness that has to be considered as a coherent process from the design of aircraft to the monitoring of its technical condition in airline service. Different airworthiness requirements for civil aircraft under CAA, FAA, JAR and ICAO regulations are introduced.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a. Familiarize aircraft airworthiness including both the technical aspects of certification and the legal and economic implications; b. Analyze types of certificate process, procedure and implementation; c. Understand aircraft maintenance procedures and certification process; d. Effectively communicate with aviation professionals with fluency in English and Chinese writing and speaking.
Subject Synopsis/ Indicative Syllabus	***General*** **-** Convention on International Civil Aviation; Annexes 1, 6, 7, 8, 16 and 19; State of Design, State of Manufacture, State of Registry and State of the Operator; Classification of aircraft; Registration of aircraft and Noise Certification. ***Type Certification of Aircraft*** **-** Design aspects of airworthiness requirements for aeroplanes, helicopters, engines and propellers in terms of Flight, Structure, Design and Construction, Tests and Inspection, Rotors and Powerplant, Systems and Equipment, Operating Limitations and Information, Crashworthiness and Cabin Safety, Operating Environment and Human Factors, and Security; Proof of compliance of applicable airworthiness requirements; Type Certificate; and Supplementary Type Certificate. ***Production*** **-** Aircraft Production; Production Approval. ***Certificate of Airworthiness*** **-** Issuance and continued validity of a Certificate of Airworthiness; Flight manual; Weight and balance of aircraft; and Temporary loss of airworthiness. ***Design and Manufacturing of Products Other Than Aircraft*** **-** Type validation/acceptance of engines and associated equipment; Design and production approval of aircraft equipment and accessories; Approval of radio apparatus; Parts Manufacturing Approval.

	Continuing Airworthiness of Aircraft **-** Responsibilities of Contracting States in respect of continuing airworthiness; Airworthiness Directives; and Aircraft leasing. ***Aircraft Maintenance*** **-** Maintenance Steering Group (MSG-3); Maintenance Review Board Report; Maintenance Planning Data; Maintenance Programme; Condition Monitoring and Reliability Programme; Modification and Repair; Certificate of Return to Service; Certificate of Maintenance Review; ***Changes to Type Design*** **-** Classification of modification and repairs; Flight testing; Certificate of Fitness for Flight; Permit to Fly; Responsibilities of Type Design organization and aircraft operator; changes to approved documents. ***Maintenance Support Arrangement*** **-** Air Operator Certificate; Operational Specifications; Maintenance Agreement; and Minimum Equipment List. ***Approval of Aircraft Maintenance Organization and Aircraft Maintenance Training Organization*** ***Licensing of Aircraft Maintenance Personnel*** ***In Service Reporting System*** ***The Chinese Vocabulary and Terminology in Air Transportation*** **-** Reading of various Chinese profession-related manuals, such as Aircraft Maintenance Manual (AMM, 飛機維修手冊), Illustrated Parts Catalog（IPC, 飛機件號手冊）, Fault Reporting Manual（FRM, 故障報告手冊）, Fault Isolation Manual（FIM, 故障隔離手冊）and Tool and Equipment Manual（TEM, 工具設備手冊 ）etc.# # "The Chinese Vocabulary and Terminology in Air Transportation" is taught by CBS academic staff.
Teaching/Learning Methodology	Lectures are used to deliver the knowledge of airworthiness to the students. Site visits will be arranged to provide them the real insight of aircraft maintenance procedure and airport operations. Industrial experts will be invited to share their experience and provide case studies to the students.
Assessment Methods in Alignment with Intended Learning Outcomes	<table><tr><td rowspan="2">Specific assessment methods/tasks</td><td rowspan="2">% weighting</td><td colspan="4">Intended subject learning outcomes to be assessed</td></tr><tr><td>a</td><td>b</td><td>c</td><td>d</td></tr><tr><td>1. Examination</td><td>50%</td><td>√</td><td>√</td><td>√</td><td>√</td></tr><tr><td>2. Assignment</td><td>10%</td><td>√</td><td></td><td>√</td><td>√</td></tr><tr><td>3. Reports and presentation (Case Study)</td><td>40%</td><td>√</td><td>√</td><td>√</td><td>√</td></tr><tr><td>Total</td><td>100%</td><td colspan="4"></td></tr></table> Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

	Overall Assessment: 0.5 x End of Subject Examination + 0.5 Continuous Assessment Examination is adopted to assess students' understanding on aircraft regulations, maintenance process and procedure and basic airworthiness related information. Site visits are used to provide the students real insight on aircraft maintenance process and opportunities to communicate with aviation professionals in the field. Case study report provides the students self-study opportunity to study and analyze different cases of aircraft problems related to airworthiness.	
Student Study Effort Expected	Class contact:	
	▪ Lecture English Session Chinese Session (CBS)	 20 Hrs. 10 Hrs.
	▪ Tutorials	9 Hrs.
	Other student study effort:	
	▪ Assignments	20 Hrs.
	▪ Report	60 Hrs.
	Total student study effort	119 Hrs.
Reading List and References	1. Hong Kong Aviation Requirements. 2. Airport Planning & Management. Edited by Alexander T. Wells, latest edition, McGraw Hill. 3. Aircraft Safety: Accident Investigations, Analyses & Applications. Edited by Shari Stamford Krause, latest edition, McGraw Hill. 4. 民用航空術語編輯組（2002）《民用航空旅客運輸術語》。中國標準出版社。 5. 民用航空術語編輯組（2002）《民用航空貨物運輸術語》。中國標準出版社。	

August 2017

Subject Description Form

Subject Code	IC380
Subject Title	Integrated Aviation Engineering Project
Credit Value	4 Training Credits
Level	3
Pre-requisite / Co-requisite/ Exclusion	Nil
Objectives	This subject aims at developing students' understanding on the principles and operations of common aircraft manufacturing process. Through undertaking hands-on projects, students will also be able to integrate their academic knowledge with practical skills about key engineering stages including: project planning, machining, assembly, testing and evaluation.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a) Demonstrate a practical understanding on the working principle, capability and operation of major aircraft manufacturing processes; b) Select and use appropriate materials and manufacturing processes for specific parts requirements; c) Work collaboratively and effectively to execute key stages of a manufacturing projects; and d) Show a commitment to quality, timeliness, regulation conformance, and continuous improvement.
Subject Synopsis/ Indicative Syllabus	<u>Digital machining</u> • Materials and manufacturing of common aircraft engine parts; • Working principle and operation of metal removal processes including turning, milling, drilling; • Practical appreciation of precision multi-axis machining and coordinate measurement; <u>Sheet-metal fabrication</u> • Materials and constructions of common metal airframe structures; • Working principle and operation of sheet-metal fabrication processes including bending, drilling, riveting; • Practical appreciation of damage removal and bolted repair techniques. <u>Fiber composites fabrication</u>

	• Materials and constructions of common fiber composites airframe components; • Working principle and operation of composites fabrication processes including wet-layup, pre-preg layup, autoclave curing; • Practical appreciation of composites damage detection techniques including tap-test, UT A scan, and UT C scan; • Practical appreciation of damage removal and bonded repair techniques. <u>Project management</u> • Use of aircraft repair manuals and other technical documentations; • Quality control and record-keeping practices; • Appreciation of computer-aided product data management (PDM).
Learning Methodology	Group-based integrative-project will be used to enable students to integrate practical skill sets through fabricating and optimising physical products. Examples of physical products are: Airframe structures, cabin installations, aircraft maintenance tools, jigs and gauges, *etc*. Workshop-based hands-on activities will be used for students to appreciate the principles and operations of common aircraft manufacturing technologies, and to acquire essential practical skills for them to carry out project tasks. Short lectures, demonstrations, and tutorials will be mixed with hands-on activities to deliver technical contents. The project fabrication work and hands-on practices will be scheduled to intertwine to facilitate reflective observation. Technical handouts will be available on-line for students to familiarise with the technical contents before lesson.

Assessment Methods in Alignment with Intended Learning Outcomes

Assessment Methods	Weighting (%)	Intended Learning Outcomes Assessed			
		a	b	c	d
1. Workshop assignments	45	X	X		
2. Quizzes	15	X	X		
3. Performance of final product	20		X	X	
4. Training report	20	X	X	X	X
Total	100				

Workshop assignments in the form of small group manufacturing tasks will be used to assess how well students understand the working principle, capabilities, and operation of the manufacturing processes. Students' skill-level will be evaluated by the artifacts they produced, while their engineering judgment and critical thinking be evaluated by individually filled task worksheets.

Multiple-choice quizzes will be used to assess broadly the students' understanding of declarative knowledge covered by the subject.

Performance of final product, evaluated by product trials, QC checks, and supervisors' inspection, will be used to assess how well the students exercise their engineering judgments, and how efficient they working as a team.

Individual training report will be used to assess holistically how well the students consolidate technical contents, reflect on their engineering decisions, and critically review their team-working. The students also elaborate on their professional attitude and commitment in their writing.

Student Study Effort Expected

Class Contact	
▪ Hands-on practice	36 Hrs.
▪ Project	84 Hrs.
Other Study Effort	0 Hrs.
Total Study Effort	**120 Hrs.**

Reading List and References	Reference Standards and Handbooks: 1. FAA-H-8083-30 Aviation Maintenance Technician Handbook – General Chapter 5: Aircraft Materials, Processes, and Hardware, 2008 2. FAA-H-8083-31 Aviation Maintenance Technician Handbook – Airframe Chapter 08 Aircraft Painting and Finishing, 2012 3. FAA-H-8083-31 Aviation Maintenance Technician Handbook – Airframe Chapter 04 Aircraft Metal Structural Repair, 2012 4. FAA-H-8083-31 Aviation Maintenance Technician Handbook – Airframe Chapter 07 Advanced Composite Material, 2012

July 2017

Discipline-Specific Requirements (DSR)

Elective Subjects

Subject Description Form

Subject Code	EE4351S / EE4351B
Subject Title	Aircraft Electrical and Actuation Systems
Credit Value	3
Level	4
Pre-requisite / Co-requisite/ Exclusion	Nil
Objectives	1. To develop students' knowledge on the components and operating principles of electrical and actuation systems in civil transport aircraft. 2. To provide students an overview of the electrical system of aircraft. 3. To develop students' understanding of the basic concepts, technology and applications in aviation industry.
Intended Learning Outcomes	Upon completion of the subject, students will be able to understand: a. basic electrical and electromagnetic principle for aircraft b. aircraft electrical systems including electro-hydraulic system, electrical systems, battery system, emergency electrical system; c. actuation system and machines for aircraft
Subject Synopsis/ Indicative Syllabus	***Electrical Systems*** - Aircraft electrical and distribution system, Aircraft power generation, Ground Power Supply, Power distribution, Power Converter. ***Aircraft Power Electronics and Drives –*** Transformer rectifier unit, inverter, Variable speed constant frequency, brushless motors. ***Electrical Energy Storage*** – Batteries technology, Battery charger, super-capacitors, battery management system. ***Emergency Systems*** - Emergency power sources, Interruptible power supply, Warning and Protection. ***Environmental Electrical Systems*** – Aircraft lighting, air conditioning, windscreen anti-ice systems, Anti-Skid systems. ***Electric Actuation*** – Power electronic actuators, Landing gear and Electrical flap systems, Key helicopter systems. ***More Electric Aircraft*** – Fault tolerant power distribution, energy optimized aircraft, intelligent and effective energy management.

Teaching/Learning Methodology

Lectures and tutorials are used to deliver the knowledge in relation to various aircraft electrical systems and actuation systems (outcomes a to c).

Teaching/Learning Methodology	Intended subject learning outcomes		
	a	b	c
1. Lectures	✓	✓	✓
2. Tutorials	✓	✓	✓

Assessment Methods in Alignment with Intended Learning Outcomes

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed		
		a	b	c
1. Mini-Project	25%	✓	✓	✓
2. Test	25%	✓	✓	✓
3. Examination	50%	✓	✓	✓
Total	100%			

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

The mini-projects are designed to assess students' understanding of the aircraft electrical principles and whether they can present the study clearly.

The test is designed to assess students' understanding of the topics that they have learnt relative to learning outcomes (a), (b), (c). The test is usually conduced in the mid-semester to measure students' performance.

Examination: questions are designed to assess learning outcomes (a), (b) and (c). Students are required to answer five questions, each of which covers at least one of the learning outcomes.

Student Study Effort Expected

Class contact:	
▪ Lecture	30 Hrs.
▪ Tutorial and presentation	9 Hrs.
Other student study effort:	
▪ Mini project or Assignment	27 Hrs.
▪ Self study	51 Hrs.
Total student study effort	117 Hrs.

Reading List and References

1. "Military and aerospace electronics", PennWell Publishing Company, Periodic.
2. "Aircraft Electrical Systems", E.H.J. Pallet, Pearson Prentice Hall, 1997

	3. “Aircraft Electricity and Electronics”, Thomas Eismin, 6th Edition, McGraw-Hill Education, 2013. 4. Aircraft systems: Mechanical, Electrical and Avionics subsystem integration”, Ian Moirand and Allan Seabridge, Wiley, 2013. 5. “Principles of electric machines and power electronics”, P.C. Sen, Wiley, 2013. 6. Power Electronics: A First Course”, N. Mohan, John Wiley & Sons, 2012.

June 2017

Subject Description Form

Subject Code	EIE4112
Subject Title	Avionics Systems
Credit Value	3
Level	4
Pre-requisite	AAE3005 Introduction to Aircraft Design & Aviation Systems or EIE3331/EIE3381/EIE331/EIE381 Communication Fundamentals or ME45002 Aircraft Systems
Co-requisite/ Exclusion	Nil
Objectives	To provide students with knowledge of communications, electronics aspects of avionics, including aircraft instruments and integrated systems, and navigation systems.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: 1. possess essential knowledge and skills in the area of avionics systems; 2. apply their knowledge, skills and hand-on experience to manufacture and maintain existing products; analyze and develop new modules and components in avionics systems for desired needs; 3. extend their knowledge of avionics systems to different situations of engineering context and professional practice; and
Subject Synopsis/ Indicative Syllabus	**Regulatory Agencies & related documents:** ICAO Annex 10, FAA, RTCA; Concept of TSO; ARINC; DO-160. **Airborne Communications Systems:** VHF & HF transceivers, VDL modes; NAVCOM; EPIRB. **Terrestrial Radio Navigation & Landing Aids:** NDB**;** VOR; DVOR; DME; ILS & GP; Radar altimeters & AID. **Satellite Navigation:** Introduction to GNSS and its impacts on Performance-based navigation – RNAV & RNP. **Surveillance Systems:** Primary & Secondary Radars; ATCRBS replies; TCAS; ADS-B. **Cockpit Integration:** Display technologies; Instrument Placement. **On Board Data Buses:** ARINC 429; ARINC 629; ARINC 825 CAN Bus. **Electronic Flight Control:** FBW flight control features. Control laws. Safety and integrity. Redundancy and failure survival. Digital implementation and problems. Flight control software functions. **Case study:** • Case study on an avionics system/avionics subsystem/avionics component

Teaching/Learning Methodology

1. The teaching and learning methods include lectures/tutorial sessions, homework assignments, test, case study report and examination.

2. The continuous assessment and examination are aimed at providing students with integrated knowledge required for avionics systems.

3. Technical/practical examples and problems are raised and discussed in class/tutorial sessions.

Teaching/Learning Methodology	**Intended subject learning outcomes**		
	1	**2**	**3**
1. Lecture	√	√	
2. Tutorial	√	√	
3. Homework assignment	√	√	
4. Case study report	√	√	√

Assessment Methods in Alignment with Intended Learning Outcomes

Specific assessment methods/tasks	**% weighting**	**Intended subject learning outcomes to be assessed**		
		1	**2**	**3**
1. Homework assignment	20%	√	√	√
2. Test	20%	√	√	
3. Case study report	20%	√	√	√
4. Examination	40%	√	√	√
Total	100%			

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

Overall Assessment:

$$0.40 \times \text{End of Subject Examination} + 0.60 \times \text{Continuous Assessment}$$

The continuous assessment consists of three components: homework assignments, test, and case study report. They are aimed at evaluating the progress of students study, assisting them in self-monitoring of fulfilling the respective subject learning outcomes, and enhancing the integration of the knowledge learnt.

The examination is used to assess the knowledge acquired by the students for understanding and analyzing the problems critically and independently; as well as to determine the degree of achieving the subject learning outcomes.

Student Study Effort Expected		
	Class contact:	
	• Lecture	26 Hours
	• Tutorial	13 Hours
	Other student study effort:	

	• Self Study	44 Hours
	• Case Study	22 Hours
	Total student study effort:	**105 Hours**
Reading List and References	1. Helfrick A, Principles of Avionics, 7th Edition, Avionics Communications, 2012. 2. Tooley M, and Wyatt, Aircraft Electrical and Electronic Systems: Principles, Maintenance and Operation, Elsevier Ltd, 2009. 3. Collinson R.P.G., Introduction to Avionics Systems, Third Edition, Springer, Feb 2011. 4. Kayton Myron Walter R. Fried Avionics Navigation Systems, Second Edition, John Wiley and Son, Published online 2007.	
Last Updated	August 2017	
Prepared by	Dr Martin Chow	

Subject Description Form

Subject Code	ISE468
Subject Title	Managing Service Quality
Credit Value	3
Level	4
Pre-requisite/Co-requisite/Exclusion	Nil
Objectives	The subject aims to provide students with the knowledge to 1. understand the concepts of and approaches to providing quality service as a strategy to enhance competitiveness; 2. measure customer perception and use the results of these measurements to drive continuous improvement; 3. design and incorporate quality into customer facing processes; 4. nurture a service culture, develop good practices, and deploy appropriate technologies in pursuit of performance excellence through high impact quality service.
Intended Learning Outcomes	Upon completion of the subject, students will be able to a. characterize and measure service quality in specific industrial settings; b. listen to the voice of customers, measure customer satisfaction with regard to service quality, and relate the results of such measurement to customer loyalty; c. select the right strategies and processes for designing quality into services; d. select approaches for recovery from service breakdowns and develop plans for managing crisis.
Subject Synopsis/ Indicative Syllabus	1. <u>Design for service quality</u> Characteristics of service work; Strategic importance of service quality; Determining customer expectations; Inquiry techniques and observation; Establishing relationships with customers to foster loyalty. 2. <u>Measuring service quality</u> Design and use of customer satisfaction questionnaires; Analysis of survey data. 3. <u>Service Recovery</u> Recovery from service breakdown; Crisis management.

<table>
<tr><td>Teaching/Learning Methodology</td><td>A mix of lectures, group discussions (tutorials), and case studies is used to achieve the objectives of this subject. Although some of the topics are covered in a problem-based format that enhances learning effectiveness, others are covered through directed study or mini-projects so as to develop students' self-learning ability.</td></tr>
<tr><td>Assessment Methods in Alignment with Intended Learning Outcomes</td><td>
<table>
<tr><td rowspan="2">Specific assessment methods/tasks</td><td rowspan="2">% weighting</td><td colspan="6">Intended subject learning outcomes to be assessed</td></tr>
<tr><td>a</td><td>b</td><td>c</td><td>d</td><td></td><td></td></tr>
<tr><td>1. Examination</td><td>60%</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td><td></td><td></td></tr>
<tr><td>2. Coursework</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>▪ Reflective journal</td><td>5%</td><td>✓</td><td></td><td>✓</td><td></td><td></td><td></td></tr>
<tr><td>▪ Literature critique</td><td>10%</td><td>✓</td><td></td><td>✓</td><td></td><td></td><td></td></tr>
<tr><td>▪ Industrial Case study</td><td>15%</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td><td></td><td></td></tr>
<tr><td>4. Quiz</td><td>10%</td><td>✓</td><td></td><td></td><td>✓</td><td></td><td></td></tr>
<tr><td>Total</td><td>100%</td><td colspan="6"></td></tr>
</table>
Continuous assessment consists of mini-case studies and assignments. The assignments consist of critical review of a journal publication (outcomes a and c), which involves a written submission and a presentation (group work), and case study of a service industry (individual work, covering all outcomes). These tasks are designed to develop students' ability to review relevant literature, collect and analyze primary/secondary data, draw conclusions or make recommendations to address specific issues related to service quality.
</td></tr>
</table>

Student Study Effort Expected	Class contact:	
	▪ Lecture 2 hours/week × 13 weeks	26 Hrs.
	▪ Tutorial/Presentation 1 hour/week × 12 weeks	12 Hrs.
	▪ Quiz 1 hour × 1	1 Hr.
	Other student study effort:	
	▪ Self study, directed readings, preparation for the quiz and exam	36 Hrs.
	▪ Literature Critique	20 Hrs.
	▪ Industrial Case Study	25 Hrs.
	Total student study effort	120 Hrs.
References	1. Fitzsimmons, J.A.; Fitzsimmons, M.J. and Bordoloi, S.K. (2014) ***Service Management: Operations, Strategy, Information Technology***, 8th edition, McGraw-Hill 2. Harvey, J (2015) ***Complex Service Delivery Processes: Strategy to Operations***, 3rd edition, Quality Press 3. Schneider, Benjamin and White, Susan S. (2004), ***Service Quality: Research Perspectives***, Foundation for Science, SAGE Publications 4. Swartzlander, Anne (2004), ***Serving Internal and External Customers***, Pearson, Prentice Hall 5. Allen, DR and Rao, TR 2000, ***Analysis of Customer Satisfaction Data***, ASQ Press 6. Reichheld, FF 1996, ***The Loyalty Effect***, Harvard Business School Press 7. Rust, RT and Oliver, RL 1994, ***Service Quality: New Directions in Theory and Practice***, SAGE Publication	
Reading List	1. Tyagi, R.K.; Varma, N. and Vidyarthi, N. (2013) "An Integrated Framework for Service Quality: SQBOK Perspective". ***Quality Management Journal***. **20**(2), 34-47 2. Goodman, J. (2012) "Taking the Wheel". ***Quality Progress***, **45**(2), 42-47 3. Grant, Adam M. (2011) "How customers can rally your troops" ***Harvard Business Review***, **89**(6), 96-103 4. McGovern, Gail and Moon, Youngme (2007) "Companies and the Customers Who Hate Them". ***Harvard Business Review***. **85**(6), 78-84	

19.8.2015

Subject Description Form

Subject Code	ISE548
Subject Title	Risk and Crisis Management
Credit Value	3
Level	5
Pre-requisite/Co-requisite/Exclusion	Nil. However, knowledge of elementary business statistics and probability, as well as information systems for supply chain management, is preferred.
Objectives	This subject enables students to 1. master quantitative and qualitative skills necessary to strike a balance between risk and opportunity in tailoring risk mitigation for logistics systems; 2. appreciate the importance of injecting a risk culture into the organization and of identifying critical factors for implementing an organization-wide risk and crisis management strategy; 3. advocate a customer-centric Business Continuity Plan (BCP) as a marketing tool and align it with contemporary risk mitigation strategy; 4. apply and embed best practices of information system security into logistics information systems.
Intended Learning Outcomes	Upon completion of the subject, students will be able to a apply risk modeling assignment methods to evaluate the level of risk of the logistics systems; b identify how logistics systems should be configured to balance risk/reward; c implement the BCP in a practical situation to mitigate risk; d apply the skills in articulating the requirement of process and procedures for building enterprise-wide risk management.
Subject Synopsis/ Indicative Syllabus	1. <u>Risk Modeling and Management</u> Step-by-step approach in building qualitative and/or quantitative model for analysis, design, and evaluation of logistics system for mitigating risk; Application of hierarchical holographic modeling (HHM) for risk identification; Partition risk impact to select the best risk mitigation strategy based on multi-objective risk impact

<table>
<tr><td></td><td>analysis.

2. <u>Crisis Management and Risk Audit</u>

Logistics project risk management; Tracking and identifying the patterns and sources of risk; Principle of balancing risk/reward relationships; Establishing processes for emergency response, escalation, and preventive measures.

3. <u>Business Continuity Planning</u>

Strategic issues and case studies drawn from logistics service providers to highlight various topics on outsourcing and quality management issues; Disaster recovery planning; Information security management practices, including planning and audit of information systems.</td></tr>
<tr><td>Teaching/Learning Methodology</td><td>A mixture of lectures, tutorial exercises, case studies, and assignments are used to deliver the concept and application of risk and crisis management, with an emphasis on risk mitigation and balancing risk/reward. Lectures are the primary vehicle used to deliver the concept of risk and crisis management, and to teach the various quantitative and qualitative risk analysis methods. Case studies are used to integrate theories in practice and review contemporary issues and best practices of customer-centric BCP.
<table>
<tr><td rowspan="2">Teaching/Learning Methodologies</td><td colspan="4">Intended Subject Learning Outcomes to be assessed</td></tr>
<tr><td>a</td><td>b</td><td>c</td><td>d</td></tr>
<tr><td>Lecture</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr>
<tr><td>Case Study</td><td>✓</td><td>✓</td><td></td><td>✓</td></tr>
<tr><td>Project</td><td>✓</td><td></td><td>✓</td><td>✓</td></tr>
</table></td></tr>
<tr><td>Assessment Methods in Alignment with Intended Learning Outcomes</td><td>
<table>
<tr><td rowspan="2">Specific assessment methods/tasks</td><td rowspan="2">% weighting</td><td colspan="6">Intended subject learning outcomes to be assessed</td></tr>
<tr><td>a</td><td>b</td><td>c</td><td>d</td><td></td><td></td></tr>
<tr><td>1. Test</td><td>20%</td><td>✓</td><td>✓</td><td></td><td>✓</td><td></td><td></td></tr>
<tr><td>2. Project</td><td>40%</td><td>✓</td><td></td><td>✓</td><td>✓</td><td></td><td></td></tr>
<tr><td>3. Assignment</td><td>40%</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td><td></td><td></td></tr>
<tr><td>Total</td><td>100%</td><td colspan="6"></td></tr>
</table>
The test is designed to assess students’ understanding of the topics and whether or not they can present the concepts clearly.

The project is designed to assess students’ skills in applying</td></tr>
</table>

<table>
<tr><td></td><td colspan="2">different risk models, implementing BCP, and articulating the requirement of process and procedures for building enterprise-wide risk management through different case studies and group projects.

Assignments are designed to assess students' ability in identifying how the logistics systems should be configured to balance risk/reward and to implement the BCP in a practical situation for risk mitigation.</td></tr>
<tr><td rowspan="7">Student Study Effort Expected</td><td>Class contact:</td><td></td></tr>
<tr><td>▪ Lecture/Seminars</td><td>30 Hrs.</td></tr>
<tr><td>▪ Tutorial/Case studies</td><td>9 Hrs.</td></tr>
<tr><td>Other student study effort:</td><td></td></tr>
<tr><td>▪ Self learning and practice for project</td><td>27 Hrs.</td></tr>
<tr><td>▪ Assignment and report writing</td><td>40 Hrs.</td></tr>
<tr><td>Total student study effort</td><td>106 Hrs.</td></tr>
<tr><td>Reading List and References</td><td colspan="2">Textbook:

Haimes, Y, Y. 2011, Risk Modeling, Assessment, and Management, Wiley, New York

Indicative Reading:

1. Bastrom, N and Cirkovic, M, M. 2008, Global Catastrophic Risks, Oxford University Press, Oxford

2. Fraser, J and Simkins, B. 2009, Enterprise Risk Management: Today's Leading Research and Best Practices for Tomorrow's Executives, Wiley, New York

3. Snedaker, S. 2011, Business Continuity and Disaster Recovery Planning for IT Professionals, Butterworth-Heinemann</td></tr>
</table>

15.7.2010

Subject Description Form

Subject Code	ISE4016
Subject Title	Data Management and Operational Research
Credit Value	3
Level	4
Pre-requisite/Co-requisite/Exclusion	Nil
Objectives	The subject will enable students to develop the ability to 1. describe the basic concepts and methods of data management and operational research; 2. formulate models for quantitative analysis of managerial problems; 3. derive the data requirements of an operational research project; 4. identify the major applications and limitations of data management for operational research data; 5. apply data management techniques and tools for Operational Research projects.
Intended Learning Outcomes	Upon completion of the subject, students will be able to a. understand the basic principles of data management and operational research; b. convert a managerial decision problem into a model formulation; c. formulate a data management plan for operational research projects; d. apply data management and operational research tools in operational research context.
Subject Synopsis/ Indicative Syllabus	1. <u>Introduction to Data Management and Operational Research</u> Why Data Management and Operational Research are needed; the data life cycle, data sharing requirements, naming conventions, metadata, storage, data ownership, security, privacy, and long-term access, basic concepts in operations research and mathematical modeling 2. <u>Data Warehousing and OLAP</u> Introduction to data warehouse; Data warehouse components;

<table>
<tr><td></td><td>Building data warehouse; On-Line Analytical Processing (OLAP); Patterns and models.

3. <u>Modeling and Analysis Techniques for Operational Data</u>

Data preprocessing, Association; Classification; Clustering; Weka; Cases studies drawn from industrial and business applications.</td></tr>
<tr><td>Teaching/Learning Methodology</td><td>A mix of lectures, tutorials, and lab sessions is used to deliver the various topics in this subject. Lectures are conducted to introduce students to theoretical concepts and techniques. Some topics are covered in a problem-based format to enhance learning objectives. Lab sessions will be used to illustrate practical application of theories and techniques. Students are given the opportunity to gain hands-on experience on operating Data Management tools during the laboratory sessions.</td></tr>
<tr><td>Assessment Methods in Alignment with Intended Learning Outcomes</td><td>
<table>
<tr><td rowspan="2">Specific assessment methods/tasks</td><td rowspan="2">% weighting</td><td colspan="6">Intended subject learning outcomes to be assessed</td></tr>
<tr><td>a</td><td>b</td><td>c</td><td>d</td><td></td><td></td></tr>
<tr><td>1. Project</td><td>35%</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td><td></td><td></td></tr>
<tr><td>2. Lab exercise</td><td>35%</td><td></td><td>✓</td><td>✓</td><td>✓</td><td></td><td></td></tr>
<tr><td>3. Presentation</td><td>15%</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td><td></td><td></td></tr>
<tr><td>4. Quiz</td><td>15%</td><td>✓</td><td>✓</td><td></td><td></td><td></td><td></td></tr>
<tr><td>Total</td><td>100%</td><td colspan="6"></td></tr>
</table>
Continuous assessments consist of a project, lab exercises, presentation, and quizzes that are designed to facilitate students to achieve the intended learning outcomes. Lab exercise is designed to encourage students to acquire deep understanding of the relevant knowledge from hands-on practice. Project is designed to enhance students' ability to holistically apply what they have learnt in the context of a real problem through team work. Presentation is designed to facilitate students to show ability to communicate complex concepts clearly. Quiz is designed to test students' understanding and application of theoretical concepts and techniques acquired.</td></tr>
</table>

Student Study Effort Expected	Class contact:	
	▪ Lectures 3 hours/week x 6 weeks	18 Hrs.
	▪ Lab., presentation, test 3 hours/week x 7 weeks	21 Hrs.
	Other student study effort:	
	▪ Preparation for the lab reports, presentations and quizzes	41 Hrs.
	▪ Preparation for quizzes, and self-study	40 Hrs.
	Total student study effort	120 Hrs.
Reading List and References	1. Han JW, Kamber M, and Pei J 2011, *Data Mining: Concepts and Techniques*, 3rd ed., Morgan Kaufmann Publishers 2. Tan, P, Steinbach M and Kumar V 2006, *Introduction to Data Mining*, Addison Wesley 3. Berson A, and Dubov L 2010, *Master Data Management And Data Governance*, 2nd ed., McGraw-Hill 4. Taha, H A 2007, *Operations Research*, 8th edn, Pearson 5. Taylor, B W III 2012, *Introduction to Management Science*, 11th edn, Prentice Hall 6. Winston, W L 2011, *Microsoft® Excel® 2010: Data Analysis and Business Modeling*, 3rd ed., Microsoft Press 7. Hillier, F S and Lieberman, G J 2010, *Introduction to Operations Research*, 9th edn, McGraw-Hill	

18.3.2014

Subject Description Form

Subject Code	ISE4017
Subject Title	Advanced Manufacturing Technology for Aircraft Production
Credit Value	3
Level	4
Pre-requisite	ME37002 Aircraft Structure and Materials You should also have background knowledge on fundamentals of manufacturing technology.
Objectives	This subject provides students with 1. an understanding of some specific advanced and emerging manufacturing technologies employed in industry with an emphasis on aircraft structures and components fabrication; 2. a basic understanding of the capabilities, limitations, and productivity of these manufacturing technologies.
Intended Learning Outcomes	Upon completion of the subject, students will be able to a. comprehend the merits and limitations of the taught technologies, in terms of product properties, flexibility, productivity, quality, etc. b. identify suitable manufacturing technologies for the production of some high-value added engineering products with an emphasis on aircraft structures and components.
Subject Synopsis/ Indicative Syllabus	1. <u>Net Shape Manufacturing Technology</u> Superplastic forming and diffusion bonding; Isothermal shape rolling process; Hot isostatic pressing (HIP); Laser net shape forming; Single crystal casting; Cosworth process, Squeeze casting 2. <u>Thermoplastic Forming Technologies</u> Autoclave; Foam fabrication; Vacuum infusion technology; Liquid moulding of reactive mixtures 3. <u>Coating Systems and Technology</u> Philosophy of surface engineering: protection for corrosion and wear. Advanced coating systems for gas turbines: intermetallic barrier coatings and thermal barrier coatings; multi-layer structures, functionally gradient materials. Coating processes: electro deposition; flame spraying; plasma spray; chemical and physical vapour deposition (CVD, PVD); laser cladding

<table>
<tr><td></td><td>4. <u>Joining Processes</u>

Electron beam welding; Laser welding; Friction and stir welding; Different joining methods in composites

5. <u>Removal Processes</u>

High-speed machining; Electric discharge machining (EDM); Electrochemical discharge machining (ECDM); Water-jet machining; Laser cutting and drilling</td></tr>
<tr><td>Teaching/Learning Methodology</td><td>The subject is taught through a combination of lectures, laboratory exercises, and tutorial assignments integrated with a mini-project. The lectures introduce the student to in-depth knowledge in the current practices of advanced manufacturing technologies. The laboratory and tutorial exercises provide opportunities for student to learn and practice with guiding materials. The mini-project promotes students' ability to conduct a literature search and their self-learning skills.</td></tr>
<tr><td>Assessment Methods in Alignment with Intended Learning Outcomes</td><td>
<table>
<tr><td rowspan="2">Specific assessment methods/tasks</td><td rowspan="2">% weighting</td><td colspan="6">Intended subject learning outcomes to be assessed</td></tr>
<tr><td>a</td><td>b</td><td></td><td></td><td></td><td></td></tr>
<tr><td>1. Assignments</td><td>10%</td><td>✓</td><td>✓</td><td></td><td></td><td></td><td></td></tr>
<tr><td>2. Lab report</td><td>10%</td><td>✓</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>3. Mini-project</td><td>20%</td><td>✓</td><td>✓</td><td></td><td></td><td></td><td></td></tr>
<tr><td>4. Final examination</td><td>60%</td><td>✓</td><td>✓</td><td></td><td></td><td></td><td></td></tr>
<tr><td>Total</td><td>100%</td><td colspan="6"></td></tr>
</table>
The assignments, which are administered periodically throughout the course, are designed to facilitate students to reflect on and apply the knowledge learnt.

The laboratory exercise is designed to assess students' problem-solving skills in advanced manufacturing technology.

The mini-projects follow a problem-based format and include case studies, presentations, and report writing. They are designed to facilitate students to acquire the relevant knowledge and demonstrate their ability to apply different technologies. The final examination is used to assess students' individual achievement in all of the intended learning outcomes.</td></tr>
<tr><td rowspan="2">Student Study Effort Expected</td><td>Class contact:</td><td></td></tr>
<tr><td>▪ Lectures</td><td>26 Hrs.</td></tr>
</table>

	▪ Tutorials	6 Hrs.
	▪ Laboratory work and mini-project	7 Hrs.
	Other student study effort:	
	▪ Guided reading , Assignments, Laboratory report	25 Hrs.
	▪ Self-study, preparation for examination	40 Hrs.
	Total student study effort	104 Hrs.
Reading List and References	1. D.F. Horne 1986, *Aircraft Production Technology*, Cambridge University Press 2. S. Kalpakjian and S.R. Schmid 2006, *Manufacturing Engineering and Technology*, Prentice Hall 3. *Advanced Materials & Processes* (serial), ASM International 4. Steve Krar and Arthur Gill 2003 *Exploring Advanced Manufacturing Technologies*, Industrial Press 5. Hassan Ei-Hofy 2005 *Advanced Machining Processes-Nontraditional and Hybrid Machining Processes*, McGraw-Hill	

27.5.2016

Subject Description Form

Subject Code	ME47002
Subject Title	Engineering Composites
Credit Value	3
Level	4
Pre-requisite / Co-requisite/ Exclusion	Pre-requisite: ME37002 Aircraft Structures and Materials; or ME33001 Mechanics of Materials
Objectives	1. To provide students with knowledge of mechanical behavior of composite materials used in aircraft. 2. To provide students with understanding of the processing, fabrication and influence of fabrication and environment on properties of aircraft composites. 3. To gain appreciation of the wide design flexibility that composites can afford.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a. Demonstrate a good understanding of types and properties of composites used in aircraft; b. Possess knowledge in processing and fabrication of structural composites; c. Understand mechanical behaviors of aircraft composite materials; d. Analyze composite laminates using classic laminate theory and apply failure criteria to assess composite structures subject to various types of loading.
Subject Synopsis/ Indicative Syllabus	***Introduction to Composites*** - Classification and characteristics of composite materials in aircraft. Mechanical behavior of composite materials. Reinforcements. Matrix materials. Green composites ***Composite Interfaces*** - Fibre-matrix interfaces. Interfacial properties. Stress transfer through composite interfaces. ***Lamina Stress-strain Relationships*** - Lamina and laminate theories. Transformation and prediction of elastic parameters. Load-deformation relationship. ***Analysis of Continuous Fibre-Reinforced Lamina and Laminates*** - Macromechanical behaviour of a lamina. Macromechanical behaviour of a laminate. ***Processing and Fabrication*** - Structural composites and their processing technology. Manufacture of laminated fibre-reinforced composite materials. Influence of fabrication and environment on properties.

Failures, Design, and Applications of Composites - Failure theories. Design optimization. Engineering applications of composites.

Laboratory Experiments
Typical experiments:

1. Manufacturing of composites
2. Tensile test of composites
3. Inspection of composites
4. Repair of a composite structure

Teaching/Learning Methodology

Lectures are used to deliver the fundamental knowledge in relation to advanced composite materials (outcomes a to d).

Tutorials are used to illustrate the application of fundamental knowledge to practical situations (outcomes a to d).

Experiments are used to relate the concepts to practical applications and students are exposed to hand-on experience, proper use of equipment and application of analytical skills on interpreting experimental results (outcomes a and b).

Teaching/Learning Methodology	Outcomes			
	a	b	c	d
Lecture	√	√	√	√
Tutorial	√	√	√	√
Experiment	√	√		

Assessment Methods in Alignment with Intended Learning Outcomes

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed			
		a	b	c	d
1. Examination	60%	√	√	√	√
2. Assignment	20%	√	√	√	√
3. Test	10%	√		√	√
4. Laboratory report	10%	√	√		
Total	100%				

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

Overall Assessment:

0.6 × End of Subject Examination + 0.4 × Continuous Assessment

Examination is adopted to assess students on the overall understanding and the ability of applying the concepts. It is supplemented by the tests,

	assignments and laboratory reports which provide timely feedbacks to both lecturers and students on various topics of the syllabus.	
Student Study Effort Expected	Class contact:	
	▪ Lecture	33 Hrs.
	▪ Tutorial/Laboratory	6 Hrs.
	Other student study effort:	
	▪ Self Study	45 Hrs.
	▪ Case study report preparation and presentation	21 Hrs.
	Total student study effort	105 Hrs.
Reading List and References	1. Ronald F. Gibson, Principles of Composite Material Mechanics, McGraw-Hill International Editions, latest edition. 2. C.T. Sun, Mechanics of Aircraft Structures, John Wiley & Sons, latest edition. 3. Celine A. Mahieux, Environmental Degradation in Industrial Composites, Elsevier, latest edition. 4. A. Brent Strong, Fundamentals of Composites Manufacturing-Materials, Methods and Applications, Society of Manufacturing Engineers, latest edition.	

Revised November 2015

Subject Description Form

Subject Code	ME47005
Subject Title	Aircraft Performance and Flight Management
Credit Value	3
Level	3
Pre-requisite / Co-requisite/ Exclusion	Nil
Objectives	To teach students the fundamental aerodynamic principles and performance analyses for the management of aircraft flight in atmosphere.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a. Demonstrate a good understanding of the aircraft wing aerodynamic forces and their management in cruising flight; b. Define the combinations of aircraft aerodynamic features and propulsion methods for different cruising requirements; c. Describe the relationships between the performance prescriptions and the power and thrust requirements for steady flight; d. Evaluate the aircraft manoeuvre stability for managing flying qualities.
Subject Synopsis/ Indicative Syllabus	***Aircraft Wing Aerodynamics*** – Airfoil lift, drag and moments. Airfoil data. Compressibility correction. Finite wing aerodynamics. Induced drag. High-lift mechanisms. ***Aircraft Performance*** – Concept of drag polar. Propulsion characteristics. Tradeoff between thrust availability and performance efficiency. Thrust and power requirements for cruising flight. Altitude effects. Climb and descent performance. Gliding flight. Takeoff and landing. Level turn, pull-up and pull-down. ***Manoeuvre Management*** – Flying qualities. Elementary concepts of stability and control. Tail surfaces. Pitching moments of airfoil. Static and dynamic stability. Longitudinal and lateral stability. Stalling and spinning. Flight management and guidance computers (FMGC).

Teaching/Learning Methodology

Lectures are used to deliver the fundamental knowledge in relation to various aspects of aerodynamic characteristics for aircraft as well as their influence in determining the aircraft performance and manouvre management for atmospheric flight (Outcomes a to d).

Tutorials are used to illustrate the application of fundamental knowledge to practical flight situations (Outcomes c and d).

Experiment on evaluating the effects on aircraft wing profile on aerodynamic force characteristics, either in laboratory or numerical setup, is provided for bridging the knowledge of aerodynamics with flight performance. Students are exposed to proper use of knowledge taught and analysis skills on evaluating their experimental results (Outcomes a and c).

Teaching/Learning Methodology	Outcomes			
	a	b	c	d
Lectures	√	√	√	√
Homework assignments		√	√	√
Test		√	√	
Examination	√	√	√	√

Assessment Methods in Alignment with Intended Learning Outcomes

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed			
		a	b	c	d
1. Homework assignments	20%	√	√	√	√
2. Experiment	15%		√		
3. Test	15%		√	√	
4. Examination	50%	√	√	√	√
Total	100%				

Explanation of the appropriateness of the assessment methods in assessing the
intended learning outcomes:

Overall Assessment:

0.50 × End of Subject Examination + 0.50 × Continuous Assessment

Examination is adopted to assess students on the overall understanding and the ability of applying the concepts. It is supplemented by continuous assessment including assignments projects and test(s), which provide timely feedback to both lecturers and students on various topics of the syllabus. Assigned homework and test are designed to enhance the students' learning of fundamental flight mechanics of an aircraft. The experiment provides students an opportunity to capitalize on the knowledge they learn for tackling practical aircraft flight performance problems. Written report and oral presentation on a specific project or case study is used to assess the students' knowledge in contemporary

	aeronautical engineering practice.	
Student Study Effort Expected	Class contact:	
	▪ Lecture	33 Hrs.
	▪ Tutorials	6 Hrs.
	Other student study effort:	
	▪ Self Study	42 Hrs.
	▪ Homework assignments	12 Hrs.
	▪ Project/Case study	12 Hrs.
	Total student study effort	105 Hrs.
Reading List and References	1. Kermondes, A. C., Mechanics of Flight, Prentice Hall, latest edition. 2. Anderson Jr., J. D., Introduction to Flight, McGraw-Hill, latest edition. 3. Torenbeek, E., and Wittenberg, H., Flight Physics, Springer, latest edition. 4. Hull, D. G., Fundamentals of Airplane Flight Mechanics, Springer, latest edition.	

March 2014