THE HONG KONG POLYTECHNIC UNIVERSITY
香港理工大學

Department of
Aeronautical and Aviation Engineering
航空及民航工程學系

Department of
Aeronautical and Aviation Engineering

Master of Science in Aviation Engineering

Programme Code: 48004

Programme Requirement Document
2024 cohort

September 2024

CONTENT

PART A Programme Scheme

PART B Subject Description Forms (Compulsory/Core Subjects)

This Programme Requirement Document is applicable for 2024-25 intakes. It is subject to review and changes which the Programme Host Department can decide to make from time to time. Students will be informed of the changes as and when appropriate.

For ease of reading only the masculine pronoun has been used throughout this booklet. Women staff members and students should not take the omission of 'she', 'her' or 'hers' as being other than an editorial convenience.

PART A Programme Scheme

1. General Information

1.1 Programme Title

Master of Science in Aviation Engineering

1.2 Programme Code

48004-NAE/AET/OAE

1.3 Modes of Attendance and Normal Duration of Study

Mode		Normal Duration			
Mixed-mode	**FT**	1.5	year(s)	3	semester(s)
	PT	2.5	year(s)	5	semester(s)
100% Online**		2.5	year(s)	5	semester(s)

** (1) A hybrid-mode of attendance is provided: face-to-face and 100% online. All the teaching activities, including assessment, are delivered/conducted in the hybrid mode and recorded.

(2) Non-local students can opt for face-to-face mixed-mode or 100% online mode. However, 100% online mode is only available for non-local students.

(3) The tuition fees of 100% online mode are the same as the face-to-face mode.

(4) 100% online mode students will be registered as part-time students. They are not eligible to apply for the IANG visa from the HK Immigration Department.

The mixed-mode of study provides an option for students to engage in a full-time (9 credits or more per semester) or part-time study load (less than 9 credits per semester). Full-time students normally take 3 to 5 subjects in a semester, and part-time students usually take 2 subjects. Students may have their study load vary from semester to semester which will accordingly affect their entitlement to University's services.

Students should complete the programme within the normal duration of the programme. Those who exceed the normal duration of the programme will be de-registered from the programme unless prior approval has been obtained from relevant authorities.

1.4 Host and Contributing Departments

The Master of Science in Aviation Engineering is hosted by the Department of Aeronautical and Aviation Engineering.

1.5 Fund Type

Self-financed

1.6 Final Awards

Upon successful completion, students will graduate with either one of the following awards:

- MSc in Aviation Engineering
- MSc in Aviation Engineering (Aviation Operations and Management)
- MSc in Aviation Engineering (Aeronautical Engineering)

Note: Students may apply and exit the MSc programme with a Postgraduate Diploma (PgD) subject to meeting the specified requirements.

1.7. Entrance Requirements

A Bachelor's degree with Honours in engineering, science or technology, or qualifications that satisfy the academic requirements for Corporate Membership of the Hong Kong Institution of Engineers (HKIE), or the equivalent.

Consideration will also be given to candidates who have other relevant qualifications and/or appropriate working experience.

Applicants who are not native speakers of English, and the Bachelor's degree or equivalent qualification is awarded by institutions where the medium of instruction is not English, they are expected to fulfil the following minimum English language requirement:

(a) A Test of English as a Foreign Language (TOEFL) score of 80 for the Internet-based test; OR

(b) An overall Band Score of at least 6 in the International English Language Testing System (IELTS).

Individual cases will be considered on their own merit by the departments concerned. Applicants may be required to attend interviews or tests to further demonstrate their language proficiency.

1.8 Graduation Requirements

A student would be eligible for award if he satisfies all the conditions listed below:

(a) Accumulation of the requisite number of credits – 31 for MSc; 19 for PgD exit award;

(b) Satisfying the residential requirement for at least 1/3 of the credits to be completed for the award he is currently enrolled, unless the professional bodies stipulate otherwise;

(c) Satisfying all requirements as defined for the respective awards and as specified by the University;

(d) Having a Grade Point Average (GPA) of 1.70 or above at the end of the programme; and

(e) Having successfully completed the Online Tutorial on Academic Integrity (see below).

(f) Having fulfilled the National Education (NE) Requirement (see below).

Online Tutorial on Academic Integrity – A mandatory requirement for graduation

To help students understand the importance of academic honesty and learn ways to ensure that their work and behaviour at PolyU are acceptable in this regard, students admitted to the Scheme in 2014/15 and beyond will be required to complete an Online Tutorial on Academic Integrity on a mandatory basis. Students need to complete the Tutorial preferably by Week 5 and the latest by end of the first semester they are admitted to the programme. Students without completing the Tutorial successfully will not be considered for graduation.

The Online Tutorial can be accessed on LEARN@PolyU (理學網). It takes approximately two hours to complete. Detailed information and instructions about the tutorial are posted at "*Online Tutorial on Academic Integrity: A Student Guide"*. (http://www.polyu.edu.hk/ogur/academic_integrity/Student_Guide.pdf.)

National Education (NE) Requirement - A mandatory requirement for graduation for students admitted in or after 2022/23

Students enrolled on taught postgraduate programmes are required to complete the National Education (NE) Requirement. It is a 3-hour online module plus 7 hours of self-study on 'National Education' at their own pace, and pass the assessment (multiple attempts allowed) in the form of multiple-choice questions online as a graduation requirement. Except for students who have been granted an exemption, students without completing the module successfully will not be considered for graduation. Details are posted at https://www.polyu.edu.hk/ous/nationaleducation/understandingchina-and-hongkong/.

1.9 Application for Graduation

Application for Postgraduate Diploma exit award

Students who wish to exit the programme with a PgD should submit an application via Form AR84c in the semester they want to do so.

Application to graduate with a specialism

Students who wish to graduate from the MSc award with a specialism should apply for graduation via Form AR84c in the semester they deem having satisfied the award requirements concerned.

Students should refer to the Student Handbook for the application deadline stipulated for each semester. Applications for graduation will be considered by the Scheme's Board of Examiners in each semester and the results will be conveyed to students via eStudent (Examination Result Notification). Students will NOT be informed separately of the application results. Students who are unsuccessful in the application should submit another application for graduation in subsequent semester/academic year.

Students can download Form AR84c at
https://www.polyu.edu.hk/ar/web/en/for-polyu-students/application-forms/index.html

1.10 Credit Fee

HK$6,100 per credit.

1.11 Summer Term Teaching

The programme does not have a mandatory Summer Term.

1.12 Daytime and Evening Teaching

Subjects will be offered predominately in the evenings. Some subjects may be made available in daytime. In general, each subject requires a 3-hour class per week over a 13-week semester.

2. Aims, and Intended Learning Outcomes (ILOs) of the Programme

2.1 University Mission

(a) To pursue impactful research that benefits the world;

(b) To nurture critical thinkers, effective communicators, innovative problem solvers and socially responsible global citizens; and.

(c) To foster a University community in which all members can excel in their aspirations with a strong sense of belonging and pride.

2.2 Programme Aims of the Programme

(a) To provide advanced education and training for students who intend to upgrade their knowledge and to seek a higher level career in the area of Aviation and Aeronautical Engineering;

(b) To enable students to develop their competence to increase their competitiveness in the job market and become the backbone in aviation industry;

(c) To enable students to have good understanding and mastering of the most up-to-date advanced technologies in the area of Aviation and Aeronautical Engineering; and

(d) To enable students to apply their learned knowledge and skills to solve problems encountered in practice.

2.3 Relationship of Programme Aims to University Mission

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

Programme Aims	University Mission		
	(a)	(b)	(c)
(a)		√	√
(b)		√	√
(c)	√	√	√
(d)	√	√	√

2.4 Institutional Learning Outcomes

The institutional learning outcomes for taught postgraduate programmes are:

(a) **Professional competence of specialists/leaders of a discipline/profession:** Graduates of PolyU taught postgraduate programmes will possess in-depth knowledge and skills in their area of study and be able to apply their knowledge and contribute to professional leadership;

(b) **Strategic thinking:** Graduates of PolyU taught postgraduate programmes will be able to think holistically and analytically in dealing with complex problems and situations pertinent to their professional practice. They will be versatile problem solvers with good mastery of critical and creative thinking skills, who can generate practical and innovative solutions; and

(c) **Lifelong learning capability**: Graduates of PolyU taught postgraduate programmes will have an enhanced capability for continual professional development through inquiry and reflection on professional practice.

2.5 Intended Learning Outcomes of the Programme

The programme has the following intended learning outcomes:

(a) **Professional competence of specialists/leaders of a discipline/profession:** Graduates will possess state-of-the-art knowledge and skills in the area of Aviation and Aeronautical Engineering and be able to apply their knowledge and contribute to professional competence, including ability to manage maintenance/repair/overhaul business and airline/airport operation, perform aircraft design and engineering to meet desired needs. They will have the readiness for assuming a leadership role in their field of practice;

(b) **Critical and creative thinking:** Graduates will be able to think holistically, critically, strategically and creatively in dealing with complex problems and situations pertinent to their professional practice. They will be versatile problem solvers with good mastery of critical and creative thinking skills, who can generate practical and innovative solutions to novel problems; and

(c) **Lifelong learning capability:** Graduates will have recognition of the need for, and an ability to engage in life-long learning.

2.6 Relationship of Intended Learning Outcomes to Programme Aims

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

Intended Learning Outcomes		Programme Aims		
	(a)	(b)	(c)	(d)
(a)	√	√	√	√
(b)	√	√	√	√
(c)		√		√

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

The following table illustrates the relationship between intended learning outcomes of the programme to Institutional learning outcomes:

Intended Learning Outcomes	Institutional Learning Outcomes		
	(a)	(b)	(c)
(a)	√		
(b)		√	
(c)			√

3. Curriculum Structure

The following are core subjects in the MSc in Aviation Engineering with their specialism specified:

Specialism	Subjects	Credits
Aviation Operations and Management	**AAE5001 Guidance, Navigation and Advanced Avionics System**	**3**
	AAE5002 Human Factors, Accident Prevention and Aircraft Maintenance	**3**
	AAE5101 Next Generation Air Traffic Control and Air Traffic Flow Management	3
	AAE5102 Operations Research, Resource Planning and Engineering Management in Aviation	3
	AAE5103 Artificial Intelligence in Aviation Industry	3
	AAE5105 Fleet Management and Aviation Sustainability	3
	AAE5106 Flight Standards and Airworthiness	
	AAE5107 Aviation Engineering Services and Aircraft Leasing Management	3
	AAE5110 Air Transport Economics and Policy	3
Aeronautical Engineering	**AAE5001 Guidance, Navigation and Advanced Avionics System**	**3**
	AAE5002 Human Factors, Accident Prevention and Aircraft Maintenance	**3**
	AAE5201 Aerodynamics and Computational Fluid Dynamics	3
	AAE5202 Advanced Aircraft Structures and Materials	3
	AAE5203 Aircraft Design and Certification	3
	AAE5204 Autonomous Flight - Mechanics and Control	3
	AAE5205 Aircraft Engine Systems and Combustion	3
	AAE5206 Artificial Intelligence in Aerospace Engineering	3

Students are required to complete a 1-credit subject for Academic Integrity and Ethics (AIE) Requirement.

- EEE5T03 Engineering Ethics and Academic Integrity

Students in this programme may take a practical research project (a 9-credit dissertation) which is designed to incorporate career development skills.

3.1 Core Subjects Requirements of Awards

3.1.1 MSc in Aviation Engineering

To be eligible for the award of an MSc in Aviation Engineering, students must complete:

- 7 taught subjects, including at least 4 AAE Core Subjects, and a Dissertation; **OR**
- 10 taught subjects, including at least 6 AAE Core Subjects.

To be eligible for the exit award of a PgD in Aviation Engineering, students must complete:

- 6 taught subjects, including at least 4 AAE Core Subjects.

3.1.2 MSc in Aviation Engineering (Aviation Operations and Management)

To be eligible for the award of an MSc in Aviation Engineering (Aviation Operations and Management Engineering), students must complete:

- 7 taught subjects, including at least 4 AAE Core Subjects in the Specialism of Aviation Operations and Management, and a Dissertation; **OR**
- 10 taught subjects, including at least 6 AAE Core Subjects in the Specialism of Aviation Operations and Management.

To be eligible for the exit award of a PgD in Aviation Engineering (Aviation Operations and Management Engineering), students must complete:

- 6 taught subjects, including at least 4 AAE Core Subjects in the Specialism of Aviation Operations and Management.

3.1.3 MSc in Aviation Engineering (Aeronautical Engineering)

To be eligible for the award of an MSc in Aviation Engineering (Aeronautical Engineering), students must complete:

- 7 taught subjects, including at least 4 AAE Core Subjects in the Specialism of Aeronautical Engineering, and a Dissertation; **OR**
- 10 taught subjects, including at least 6 AAE Core Subjects in the Specialism of Aeronautical Engineering.

To be eligible for the exit award of a PgD in Aviation Engineering (Aeronautical Engineering), students must complete:

- 6 taught subjects, including at least 4 AAE Core Subjects in the Specialism of Aeronautical Engineering.

Students can select subjects from the subject pools to fulfil the graduation requirements. Subjects from the sister departments under FENG will also be applicable to the graduation requirements.

Remarks: Students of MSc Aviation Engineering who opt for the 100% online mode can only choose elective subjects from the list of AAE Core Subjects.

3.2 Curriculum Map

The curriculum map shown below indicates how each intended learning outcomes of the programme is addressed by the constituent subjects.

Compulsory/Core Subjects	Intended Learning Outcomes		
	(a) Professional competence	**(b) Critical & creative thinking**	**(c) Lifelong learning capability**
AAE5001 Guidance, Navigation and Advanced Avionics System	√	√	√
AAE5002 Human Factors, Accident Prevention and Aircraft Maintenance	√	√	√
AAE5101 Next Generation Air Traffic Control and Air Traffic Flow Management	√	√	√
AAE5102 Operations Research, Resource Planning and Engineering Management in Aviation	√	√	√
AAE5103 Artificial Intelligence in Aviation Industry	√	√	√
AAE5105 Fleet Management and Aviation Sustainability	√	√	√
AAE5106 Flight Standards and Airworthiness	√	√	√
AAE5107 Aviation Engineering Services and Aircraft Leasing Management	√	√	√
AAE5110 Air Transport Economics and Policy	√	√	√
AAE5201 Aerodynamics and Computational Fluid Dynamics	√	√	√
AAE5202 Advanced Aircraft Structures and Materials	√	√	√
AAE5203 Aircraft Design and Certification	√	√	√

Compulsory/Core Subjects		Intended Learning Outcomes		
		(a) Professional competence	(b) Critical & creative thinking	(c) Lifelong learning capability
AAE5204	Autonomous Flight - Mechanics and Control	√	√	√
AAE5205	Aircraft Engine Systems and Combustion	√	√	√
AAE5206	Artificial Intelligence in Aerospace Engineering	√	√	√

4. Assessment Regulations

Academic regulations governing the programme are given in Appendix.

5. Student Counselling

The Programme Leader, Dr Hao Jiaao, and Deputy Programme Leader, Dr Wu Lingxiao, are available to answer questions and provide advice.

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PART B Subject Description Forms

Subject Description Form

Subject Code	AAE5001
Subject Title	Guidance, Navigation and Advanced Avionics System
Credit Value	3
Level	5
Pre-requisite/ Co-requisite/ Exclusion	Nil
Objectives	To provide students with the basic knowledge of guidance, navigation their application in advanced avionics systems.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a. develop an understanding of basic concepts of guidance and navigation; b. understand the working principle of the state-of-the-art navigation systems used in aviation and aeronautical systems; c. apply the knowledge to design and develop advanced avionics systems.
Subject Synopsis/ Indicative Syllabus	**Terrestrial Navigation Aids:** the basic principles of NDB, VOR, DME, ILS, and etc. **Inertial Navigation**: the basic principles of inertial navigation; inertial sensors of accelerometer, gyro; inertial navigation algorithms. **Satellite Navigation**: the principles of satellite navigation; receiver signal processing; stand-alone positioning and differential positioning. **Radar**: the principles of primary radar, secondary radar, weather radar, surveillance radar, and etc. **Advanced Avionics System**: applications in civil aviation, e.g., space-based augmentation system; ground-based augmentation system; receiver autonomous integrity monitoring. **Multi-sensor Integration**: least squares estimation and Kalman filter; performance of precision versus integrity under different scenarios.

Teaching/Learning Methodology

The teaching and learning methods include lectures and tutorials.

Lectures are aimed at providing students with an integrated knowledge required for understanding fundamental concepts in guidance, navigation and advanced avionics systems. Theories and examples will be presented to cover the syllabus.

Tutorials are aimed at enhancing the analytical skills of the students. Examples will be provided to teach students the skills of designing advanced guidance laws and avionics systems. Students will be able to solve real-life problems using the knowledge they acquired in the class.

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

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. Assignment	20%	√	√	√
2. Quiz	10%	√	√	√
3. Case study presentation	30%	√	√	√
3. Final examination	40%	√	√	√
Total	100%			

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

Overall Assessment:

$$0.6 \times \text{Continuous Assessment} + 0.4 \times \text{Final Examination}$$

The continuous assessment consists of assignment, quiz and case study presentation, which 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 final examination is used to assess the knowledge acquired by the students for understanding and analysing 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	39 Hrs.
	Other student study effort:	
	▪ Self-learning	45 Hrs.
	▪ Homework	21 Hrs.
	Total student study effort	105 Hrs.
Reading List and References	1. Kabamba P.T. and Girard A.R., Fundamentals of Aerospace Navigation and Guidance, Cambridge Aerospace Series, 2014. 2. Nebylov A.V. and Watson J., Aerospace Navigation Systems. John Wiley & Sons, 2016. 3. Collinson R.P.G., Introduction to Avionics Systems, Springer, latest edition. 4. Tooley M, and Wyatt, Aircraft Electrical and Electronic Systems: Principles, Maintenance and Operation, Elsevier Ltd, latest edition.	

Jun 2024

Subject Description Form

Subject Code	AAE5002
Subject Title	Human Factors, Accident Prevention and Aircraft Maintenance
Credit Value	3
Level	5
Pre-requisite/ Co-requisite/ Exclusion	Nil
Objectives	This subject will provide students with 1. the essential concepts, ideas of human factors and accident prevention approaches in pilot training, ATC and aircraft maintenance industries; and 2. the neuroscience and research methodology in assessing human performance and errors.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a. relate human cognitive and physical capabilities and limitations to the design of human-machine systems in aviation; b. apply sound methods to identify and analyse sources of human errors for aviation accident prevention; c. design solutions to reduce human errors with consideration for human, hardware, organization, and environmental factors; and d. design human factor experiments and conduct overall human-system design evaluation via neuroscience and research methodology.
Subject Synopsis/ Indicative Syllabus	**Human factors basics:** Human error and threat management**;** Situational awareness, fatigue and stress; Non-technical skills; Crew resource management. **Research methods:** Statistical analysis, Failure modes and effect analysis; Root cause analysis; Error-case removal programme; Cause-and-effect diagram; Fault tree analysis; Subjective Scales; NASA task load index; Subjective workload assessment technique; Cooper-harper rating scale; Situational awareness global assessment technique. **Accident analysis and prevention:** Accident prevention management; Safety assessment, hazard identification and resolution; Integration of system safety and human performance in ATC, pilot and crew; Dirty dozen;

<table>
<tr><td></td><td>Human factors in aircraft maintenance and inspection: Maintenance resource management; Line operations safety assessment; Maintenance error and decision aid.</td></tr>
<tr><td>Teaching/Learning Methodology</td><td>Teaching is conducted through class lectures and case study. The basic knowledge, research methodology and theoretical models will be introduced. The understanding of how to address and identify the human factors problem and formulate the resolution will be emphasized. Research methodology, case study and analytics skills are taught in class as well as the related real-life scenarios to enhance the teaching and learning abilities.
<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>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>
</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 (Please tick as appropriate)</td></tr>
<tr><td>a</td><td>b</td><td>c</td><td>d</td></tr>
<tr><td>1. Assignment</td><td>30%</td><td>√</td><td>√</td><td></td><td></td></tr>
<tr><td>2. Case study</td><td>30%</td><td></td><td></td><td>√</td><td>√</td></tr>
<tr><td>3. Final examination</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:
0.6 × Continuous Assessment + 0.4 × Final Examination
The continuous assessment (60%) is aimed at enhancing the students' comprehension and assimilation of various topics of the syllabus via assignment and case study. The final examination (40%) will also be considered to assess the students learning outcome.
</td></tr>
<tr><td rowspan="2">Student Study Effort Expected</td><td>Class contact:</td><td></td></tr>
<tr><td>▪ Lecture/Case Study</td><td>39 Hrs.</td></tr>
</table>

	Other student study effort:	
	▪ Self-learning/preparation	36 Hrs.
	▪ Literature study/case study/reading	36 Hrs.
	Total student study effort	111 Hrs.
Reading List and References	1. Campbell, R. D., & Bagshaw, M. (2008). Human performance and limitations in aviation. John Wiley & Sons. 2. De Florio, F. (2016). Airworthiness: An introduction to aircraft certification and operations. Butterworth-Heinemann. 3. Dhillon, B. S. (2009). Human reliability, error, and human factors in engineering maintenance. 4. Dekker, S. (2004). Ten questions about human error: A new view of human factors and system safety. CRC Press. 5. Kinnison, H. A. (2013). Aviation maintenance management. McGraw-Hill Education. 6. Rodrigues, C. C., & Cusick, S. K. (2012). Commercial aviation safety. McGraw-Hill Education. 7. Stolzer, A. J., Halford, M. C. D., & Goglia, M. J. J. (2015). Safety management systems in aviation. Ashgate Publishing, Ltd. 8. Tsang, P. S., & Vidulich, M. A. (Eds.). (2002). Principles and practice of aviation psychology. CRC Press. 9. Wiegmann, D. A., & Shappell, S. A. (2017). A human error approach to aviation accident analysis: The human factors analysis and classification system. Routledge. 10. Wise, J. A., Hopkin, V. D., & Garland, D. J. (Eds.). (2016). Handbook of aviation human factors. CRC Press.	

July 2023

Subject Description Form

Subject Code	AAE5101
Subject Title	Next Generation Air Traffic Control and Air Traffic Flow Management
Credit Value	3
Level	5
Pre-requisite/ Co-requisite/ Exclusion	Nil
Objectives	This subject will provide students with 3. Essential knowledge of airport, air traffic control and air traffic flow management; 4. The latest development of the Next Generation Air Transportation System (NextGen) and Asia-pacific airport collaborative decision-making (A-CDM); 5. Critical thinking training through case studies of NextGen from different countries.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: e. apply techniques to optimise the airport and air traffic capacity; f. understand and establish a review on the effectiveness of an air traffic management system; g. streamline airport, ground and air traffic operations to gain overall turn-a-round efficiency; and h. identify the airline-airport conflict resolution approach and risk management.
Subject Synopsis/ Indicative Syllabus	**Overview of NextGen ATM System:** An introduction to ATM systems and operations. Introduce definition, goal, and benefits of NextGen initiative on different aspects including airport, air traffic control and traffic flow management. **Before and after NextGen:** Provide a comparison of improved system before and after NextGen on communications, navigation, surveillance, air traffic control, etc. **Air traffic control and managemen**t: Technical improvement in NextGen on Air traffic management, congestion control and capacity management, aviation system; Air traffic control and air traffic control aids; Seamless air traffic management and air navigation service; Extreme weather operations;

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<tr><td></td><td>
Runway scheduling and capacity analysis: Runway capacity analysis; Airport airside and landside structure and layout; First-come first-served heuristics; Runway design and configuration.

Operationalized NextGen: how to implement NextGen at the right places to raise the usage of deployed capabilities to achieve maximum benefits. Trajectory Based Operations (TBO), air and ground information exchange etc.

Uncertainty quantification and risk assessment in ATM and ground operations: Recognizing frequent aircraft routes; Ground vehicles trajectory prediction and collision risk assessment. Aviation incident risk prediction; Risk assessment, anomaly detection, and uncertainty quantification in take-off and landing.

NextGen initiatives from different countries and global harmonization: Introduce different focus of NextGen system by different countries, with detailed programs or strategies proposed and implemented. U.S.-EU collaboration in a global context for NextGen System.

Advancement in airspace technology and performance indicators: Measurement of system performance; Key issue in airport collaborative decision making in Asia pacific; Critical elements of the Next Generation Air Transportation System (NextGen); Performance and concerns of the NextGen; Airspace Technology Demonstration (ATD): ATD-2/ATD-3.

Future vision of airspace system: The future Airspace System need to accommodate emerging users and innovative business models for aviation and aerospace.
</td></tr>
<tr><td>Teaching/Learning Methodology</td><td>
Teaching is conducted through lectures and case study. Both the basic knowledge and theoretical models are going to be introduced. The understanding of how to address problems by using scientific tools is emphasised. Normally, examples of problem-solving techniques are taught in class and related scenarios are provided to students to enhance their application abilities.

Aviation system robustness and resilience
<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>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>
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<table>
<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 (Please tick as appropriate)</td></tr>
<tr><td>a</td><td>b</td><td>c</td><td>d</td></tr>
<tr><td>1. Assignment</td><td>30%</td><td>√</td><td>√</td><td></td><td>√</td></tr>
<tr><td>2. Case study</td><td>40%</td><td>√</td><td>√</td><td>√</td><td>√</td></tr>
<tr><td>3. Individual essay</td><td>30%</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:
1.0 × Continuous Assessment
The continuous assessment (100%) is aimed at enhancing the students' comprehension and assimilation of various topics of the syllabus via reading assignment and case study. Individual essay is used to assess the students' capacities of self-study and problem-solving and understanding on a specific topic to fulfil the requirements of working in the aviation industry.
</td>
</tr>
<tr>
<td>Student Study Effort Expected</td>
<td>
<table>
<tr><td>Class contact:</td><td></td></tr>
<tr><td>▪ Lecture/Case Study</td><td>39 Hrs.</td></tr>
<tr><td>Other student study effort:</td><td></td></tr>
<tr><td>▪ Literature review/case study/reading</td><td>36 Hrs.</td></tr>
<tr><td>▪ Self-learning/preparation</td><td>36 Hrs.</td></tr>
<tr><td>Total student study effort</td><td>111 Hrs.</td></tr>
</table>
</td>
</tr>
</table>

Reading List and References	1. Ashford, N. J., Stanton, H. M., Moore, C. A., Pierre Coutu, A. A. E., & Beasley, J. R. (2013). Airport operations. McGraw-Hill Education. 2. Cusick, S. K., Cortes, A. I., & Rodrigues, C. C. (2017). Commercial aviation safety. McGraw-Hill Education. 3. De Neufville, R., Odoni, A. R., Belobaba, P. P., & Reynolds, T. G. (2013). Airport systems: Planning, design, and management. McGraw-Hill Education. 4. Horonjeff, R., McKelvey, F. X., Sproule, W. J., & Young, S. B. (2010). Planning and design of airports. McGraw-Hill Education. 5. Wells, A. T. (2007). Air transportation: A management perspective: Ashgate Publishing, Ltd. 6. Young, S. B., & Wells, A. T. (2011). Airport planning and management. McGraw-Hill Education.

Jun 2024

Subject Description Form

Subject Code	AAE5102
Subject Title	Operations Research, Resource Planning and Engineering Management in Aviation
Credit Value	3
Level	5
Pre-requisite/ Co-requisite/ Exclusion	Nil
Objectives	This subject will provide students with 1. the main concepts, ideas and techniques of advanced operations research (OR), optimisation methods, resource planning and engineering management in the aviation industry; 2. the essential principles, research methodology, data interpretation and data analysis with case examples in airline and airport operations; 3. outlook of OR development and its importance in aviation operations.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a. design and develop mathematical modelling and optimisation algorithms and adopt OR tools in solving engineering problems in airline and airport operations; b. illustrate, interpret and analyse the numerical results; c. evaluate the resource planning and financial requirement in airlines and airport operations critically; and d. determine the optimal solution and alternatives for aviation engineering problems.
Subject Synopsis/ Indicative Syllabus	**Operations research,** Convex optimisation and optimisation methods in aviation engineering problems; Fundamental theorem of linear programming; Relations to convexity; Simplex method; Duality. **Resource planning and engineering management**: Transportation and network flow problems; Minimum cost flow; Maximal flow; Branch-and-bound algorithms; Heuristics; Critical path method and resource planning in aviation project management. **Aviation Engineering applications:** Airline scheduling planning and optimisation; Gate assignment planning and optimisation; Runway scheduling planning and optimisation; Air logistics transportation problem and optimisation; Flight route optimization.

Teaching/Learning Methodology

Teaching is conducted through lectures and assignment. The basic knowledge, research methodology and theoretical models will be introduced. The understanding of how to address and formulate problems by using mathematical programming, OR and optimisation algorithms techniques with modern programming language is emphasised. Research methodology, data analytics skills, algorithm design skills and programme methods are taught in class as well as the related real-life scenarios.

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

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. Assignment	20%	√	√	√	√
2. Mid-term examination	30%	√	√	√	√
3. Final examination	50%	√	√	√	√
Total	100%				

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

Overall Assessment:

$$0.5 \times \text{Continuous Assessment} + 0.5 \times \text{Final Examination}$$

The continuous assessment (50%) is aimed at enhancing the students' comprehension and assimilation of various topics of the syllabus via assignment and mid-term examination. The final examination (50%) will also be considered to assess the students' learning outcome.

Student Study Effort Expected

Class contact:	
▪ Lecture	39 Hrs.
Other student study effort:	
▪ Self-learning/preparation	36 Hrs.

	▪ Assignment	36 Hrs.
	Total student study effort	111 Hrs.
Reading List and References	1. Ashford, N. J., Stanton, H. M., Moore, C. A., Pierre Coutu, A. A. E., & Beasley, J. R. (2013). Airport operations. McGraw-Hill Education. 2. Birge, J. R., & Louveaux, F. (2011). Introduction to stochastic programming. Springer Science & Business Media. 3. Bondy, J. A., & Murty, U. S. R. (1976). Graph theory with applications (Vol. 290). London: Macmillan. 4. Boyd, S., Boyd, S. P., & Vandenberghe, L. (2004). Convex optimization. Cambridge university press. 5. Hillier, F. S. (2012). Introduction to operations research. Tata McGraw-Hill Education. 6. Leon, S. J., Bica, I., & Hohn, T. (1998). Linear algebra with applications (Vol. 6). Upper Saddle River, NJ: Prentice Hall. 7. Michael, L. P. (2018). Scheduling: theory, algorithms, and systems. Springer. 8. Nocedal, J., & Wright, S. (2006). Numerical optimization. Springer Science & Business Media. 9. O'neil, P. V. (2017). Advanced engineering mathematics. Cengage learning.	

July 2023

Subject Description Form

Subject Code	AAE5103
Subject Title	Artificial Intelligence in Aviation Industry
Credit Value	3
Level	5
Pre-requisite/ Co-requisite/ Exclusion	Nil
Objectives	This subject will provide students with 1. the main concepts, ideas and techniques of advanced artificial intelligence (AI) in the aviation industry; 2. the essential principles, research methodology, data interpretation and data analysis with case examples in airline and airport operations; and 3. outlook of artificial intelligence development and its important in future air traffic and unmanned aircraft system traffic management.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a. design and develop AI algorithms or adopt AI tools in solving engineering problems in airline and airport operations; b. illustrate and analysis the knowledge and data pattern generated by the AI-engine; c. master and understand the complex causal relationship and inferences of AI; and d. apply AI techniques for solving aviation engineering problems.
Subject Synopsis/ Indicative Syllabus	**Fundamental of Artificial Intelligence (AI)**: Basic concepts and trends of AI; AI algorithm design; deep learning; large language models. **Data Analytics:** Data processing; data mining; data visualization; principle component analysis; data-driven optimization. **Supervised learning:** Least squares and nearest neighbours; statistical decision theory; Linear methods for regression; Linear discriminant analysis; Classifications; Logistic regression; Support-vector machine. **Unsupervised learning:** Clustering; Association dimensionality reduction; K-means clustering; KNN. **Model inference and averaging:** Bootstrap and maximum likelihood methods; Bayesian method.

<table>
<tr><td></td><td>Reinforcement learning: Basic concepts of reinforcement learning; Markov Decision Processes (MDP); Q-learning.

Applications in Aviation: Air traffic demand forecasting; Flight delay prediction; Operations management and dynamic pricing; managerial implications and actionable insights with aviation case studies analysis.</td></tr>
<tr><td>Teaching/Learning Methodology</td><td>Teaching is conducted through lectures and case studies. The basic knowledge, research methodology and theoretical models will be introduced. The understanding of how to address and formulate problems using AI models and soft computing techniques is emphasised. Research methodology, data analytics skills, and algorithm design skills are taught in class as well as the related real-life scenarios using data to enhance their research abilities.
<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>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>
</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 (Please tick as appropriate)</td></tr>
<tr><td>a</td><td>b</td><td>c</td><td>d</td></tr>
<tr><td>1. Assignment</td><td>20%</td><td>√</td><td>√</td><td></td><td></td></tr>
<tr><td>2. Project report</td><td>20%</td><td></td><td>√</td><td>√</td><td>√</td></tr>
<tr><td>3. Project presentation</td><td>10%</td><td></td><td>√</td><td>√</td><td>√</td></tr>
<tr><td>4. Final examination</td><td>50%</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 × Continuous Assessment + 0.5 × Final Examination

The continuous assessment (50%) is aimed at enhancing the students' comprehension and assimilation of various topics of the syllabus via assignment and group project. The final examination (50%) will also be considered to assess the students' learning</td></tr>
</table>

	outcome, with a focus on their understanding of basic concepts, AI models, and application methods.	
Student Study Effort Expected	Class contact:	
	▪ Lecture/Case Study	39 Hrs.
	Other student study effort:	
	▪ Literature review/case study/reading	36 Hrs.
	▪ Self-study/preparation	36 Hrs.
	Total student study effort	111 Hrs.
Reading List and References	1. Barber, D. (2012). Bayesian reasoning and machine learning. Cambridge University Press. 2. Boyd, S., Boyd, S. P., & Vandenberghe, L. (2004). Convex optimization. Cambridge university press. 3. Cormen, T. H., Leiserson, C. E., Rivest, R. L., & Stein, C. (2009). Introduction to algorithms. MIT press. 4. De Neufville, R., & Odoni, A. (2003). Airport systems. planning, design and management. New York: McGraw-Hill. 5. EASA (2020). EASA Artificial Intelligence Roadmap 1.0 published: A human-centric approach to AI in aviation. EASA. 6. Eurocontrol. (2020). FLY AI report – demystifying and accelerating AI in aviation/ATM. Eurocontrol. 7. Guido, S., & Müller, A. (2016). Introduction to machine learning with python (Vol. 282). O'Reilly Media. 8. Marsland, S. (2015*).* Machine learning: an algorithmic perspective. CRC press. 9. Richert, W. (2013). Building machine learning systems with Python. Packt Publishing Ltd.	

Jun 2024

Subject Description Form

Subject Code	AAE5105
Subject Title	Fleet Management and Aviation Sustainability
Credit Value	3
Level	5
Pre-requisite/ Co-requisite/ Exclusion	Nil
Objectives	This subject will provide students with 1. advanced knowledge in airline fleet sizing, fleet assignment, flight scheduling, aircraft assignment, and aircraft routing; 2. the advanced knowledge of the major operational, technical and inventory support functions of the airline industry; and 3. the advanced emission mitigation strategy and sustainable aviation operations.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a. design and develop mathematical modelling in resolving airline fleet, crew pairing and aircraft routing problem; b. design and develop proper airline resource planning in profitable manner; c. apply various strategies and techniques to optimise and implement aircraft maintenance programmes; d. understand and apply the various inventory support models to the airline e. evaluate the impact of aviation emission and its mitigation strategy; and f. determine airline solution contributing to the societal, economic and global environment factors.
Subject Synopsis/ Indicative Syllabus	**Operations management, fleet and crew management and flight route management**: Airline fleet management, crew management, aircraft routing and sustainability; Air route planning and schedule recovery; Aircraft life cycle and associated legislation; Risk management in airline operation; Human resource management: crew pairing and rostering management. **Operational and technical Support:** Technical support functions in maintenance, repair and overhaul; development, implementation and optimisation of maintenance programmes; inventory support models and their implementation;

<table>
<tr><td></td><td>Sustainable aviation: Carbon budgets for aviation; Environmental technology and the future of flight; Aviation and the EU emissions trading system; Airport noise control and modelling; Environmental impact of aviation emission; Sustainable aviation system.</td></tr>
<tr><td>Teaching/Learning Methodology</td><td>Teaching is conducted through lectures and assignments. The basic knowledge, research methodology and theoretical models will be introduced.

The understanding of how to address and formulate problems by using mathematical programming, data analytics, and operations research techniques is emphasised. Research methodologies, such as data analytics and mathematical modelling skills, are taught in class as well as the related real-life scenarios using data to enhance their research abilities.
<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>e</td><td>f</td></tr>
<tr><td>Lecture</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 (Please tick as appropriate)</td></tr>
<tr><td>a</td><td>b</td><td>c</td><td>d</td><td>e</td><td>f</td></tr>
<tr><td>1. Assignment</td><td>30%</td><td>√</td><td>√</td><td>√</td><td>√</td><td>√</td><td>√</td></tr>
<tr><td>2. Course Project</td><td>20%</td><td></td><td></td><td>√</td><td>√</td><td>√</td><td>√</td></tr>
<tr><td>3. Final 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 assessing the intended learning outcomes:

Overall Assessment:

0.5 × Continuous Assessment + 0.5 × Final Examination

The continuous assessment (50%) is aimed at enhancing the students' comprehension and assimilation of various topics of the syllabus via assignments and a course project. The final examination (50%) will also be considered to assess the students learning outcome.</td></tr>
</table>

Student Study Effort Expected	Class contact:	
	▪ Lecture	39 Hrs.
	Other student study effort:	
	▪ Self-study / preparation	66 Hrs.
	Total student study effort	105 Hrs.
Reading List and References	1. Abdelghany, A., & Abdelghany, K. (2016). Modeling applications in the airline industry. Routledge. 2. Bazargan, M. (2016). Airline operations and scheduling. Routledge. 3. Bridger, R. (2013). Plane truth: Aviation's real impact on people and the environment. 4. Budd, L., Griggs, S., & Howarth, D. (2013). Sustainable aviation futures. Emerald Group Publishing. 5. Clark, P. (2017). Buying the big jets: fleet planning for airlines. Taylor & Francis. 6. Walker, T., & Bergantino, A. S. (2020). Sustainable Aviation. Palgrave Macmillan. 7. Wu, C.-L. (2016). Airline operations and delay management: insights from airline economics, networks and strategic schedule planning: Routledge. 8. Kinnison, Harry A., and Tariq "Terry" Siddiqui (2013). "Aviation Maintenance Management. 2nd ed. New York: McGraw-Hill Education.	

Jun 2024

Subject Description Form

Subject Code	AAE5106
Subject Title	Flight Standards and Airworthiness
Credit Value	3
Level	5
Pre-requisite/ Co-requisite/ Exclusion	Nil
Objectives	This subject will provide students with 1. the advanced knowledge in the aircraft airworthiness, flight standards, airworthiness and certification; 2. profile and qualification tests for onboard aircraft system and equipment; and 3. legal requirement of airworthiness and the importance of aircraft performance in safe operational aspects.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a. conduct documentation and review of legation requirement for flight standards and airworthiness certifications; b. understand and review the aviation safety, quality, maintenance approval and procedures and procedures of certification continuality; and c. implement and conform the relevant regulations in practices.
Subject Synopsis/ Indicative Syllabus	**Airworthiness –** Airworthiness requirement, regulations and standards; Airworthiness directive (AD); Aircraft registration; Type certification; Production of products, parts and appliances; Certificates of airworthiness and permits to fly; Air operation regulation; Renewal of certificate of airworthiness (C of A) issue; Air operator's certification; Certification arrangements with other authorities, human factors and safety management. **Flight standards –** Requirement and criteria for the approval of type rating training; Pilot licences and associated ratings; Low visibility operations; Air operator's certificates requirements; Avoidance of fatigue in aircrews. **Licensing and certification –** Aeromedical matters; Air operator's certificate; Pilot licensing; Aircraft maintenance licensing; Conversion of license among contracting states. **Quality control and assurance –** Joint maintenance management (JMM); Technical arrangement (TA); Maintenance management

<table>
<tr><td></td><td>exposition (MME); airworthiness control procedures; Maintenance support arrangement and contracted-out maintenance.

Accident prevention and analysis – Safety management system (SMS); Accident analysis; Human factors.

Air operator's certificate (AOC) – CAD 360, AOC requirements document; Operation of aircraft, arrangement for maintenance support.

Flight operations – The air operators certificate, organisation and facilities, operations manual, training and testing; Emergency and survival training, cabin safety, safety management.

International and Hong Kong civil aviation – ICAO history, annexes, safety oversight concept, safety oversight system; HK legislation system, basic law of HKSAR, civil aviation ordinance, air navigation (Hong Kong) order; Safe operating environment.</td></tr>
<tr><td>Teaching/Learning Methodology</td><td>Teaching is conducted through class lectures and case studies of airworthiness and aircraft performance to the students. The industrial experts will provide several cases and their experiences throughout the teaching and learning in this course.

<table>
<tr><td rowspan="2">Teaching/Learning Methodology</td><td colspan="3">Outcomes</td></tr>
<tr><td>a</td><td>b</td><td>c</td></tr>
<tr><td>1. Lecture</td><td>✓</td><td>✓</td><td>✓</td></tr>
<tr><td>2. Case study</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</td></tr>
<tr><td>a</td><td>b</td><td>c</td></tr>
<tr><td>1. Assignment / Case study</td><td>30%</td><td>✓</td><td>✓</td><td>✓</td></tr>
<tr><td>2. Group project</td><td>20%</td><td>✓</td><td>✓</td><td>✓</td></tr>
<tr><td>3. Final examination</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:

Overall assessment:</td></tr>
</table>

	0.50 × End of Subject Examination + 0.50 × Continuous Assessment The continuous assessment (50%) is aimed at enhancing the students' comprehension and assimilation of various topics of the syllabus via several assignments, case study and group project. The final examination assessment (50%) will also be considered to assess the students learning outcome.	
Student Study Effort Expected	Class contact:	
	▪ Lecture	30 Hrs.
	▪ Case study	9 Hrs.
	Other student study effort:	
	▪ Self-study / preparation	36 Hrs.
	▪ Assignments / group project	36 Hrs.
	Total student study effort	111 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.	

July 2023

Subject Description Form

Subject Code	AAE5107
Subject Title	Aviation Engineering Services and Aircraft Leasing Management
Credit Value	3
Level	5
Pre-requisite/ Co-requisite/ Exclusion	Nil
Objectives	This subject will provide students with 1. the operations and management of aircraft leasing industry; and 2. the advanced knowledge of aviation finance, taxation and insurance. 3. the advanced knowledge on the major operational, technical and inventory support functions to the airline industry
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a. develop and apply various auditing techniques in the MRO and airline industry**;** b. conduct aviation engineering related incident/event investigation using state-of-the-art methodologies and implement various corrective actions**;** c. define and manage the major engineering operational reliability key drivers**;** d. assess and evaluate the cost effectiveness of various non-mandatory engineering bulletins and their implementation**;** e. apply various strategies and techniques to optimise and implement aircraft maintenance programmes**;** f. understand and apply the various inventory support models to the airline; g. understand the roles and functions of various airlines business in aircraft leasing and aviation financing management; h. evaluate the cost-and-benefit in various aircraft trading modes and aircraft leasing approaches; and i. perform risk assessment and management related to aircraft leasing.

<table>
<tr><td>Subject Synopsis/ Indicative Syllabus</td><td>Operational and technical Support: Technical support functions in maintenance, repair and overhaul; quality assurance audits, audit checklist development, hazard and risk management, management of accident/incident development, implementation and optimisation of maintenance programmes, development and monitoring of operational reliability related key performance indicators, cost-benefit analysis in service bulletin evaluation process, major inventory support models and their implementation;

Aircraft leasing management: Aircraft specification review and evaluation; Auditing of aircraft and their records; Aircraft lease management; Operating lease structuring; Sales and leasebacks; Transaction risk assessment; Aircraft acquisition.</td></tr>
<tr><td>Teaching/Learning Methodology</td><td>Teaching is conducted through class lectures, which are aimed at providing students with the understanding of how to address aviation technical services and aircraft leasing problem and resolve the problem by risk assessment and operational management methods.

<table>
<tr><td rowspan="2">Teaching/Learning Methodology</td><td colspan="9">Outcomes</td></tr>
<tr><td>a</td><td>b</td><td>c</td><td>d</td><td>e</td><td>f</td><td>g</td><td>h</td><td>i</td></tr>
<tr><td>Lecture</td><td>√</td><td>√</td><td>√</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="9">Intended subject learning outcomes to be assessed (Please tick as appropriate)</td></tr>
<tr><td>a</td><td>b</td><td>c</td><td>d</td><td>e</td><td>f</td><td>g</td><td>h</td><td>i</td></tr>
<tr><td>1. Assignment</td><td>40%</td><td>√</td><td>√</td><td>√</td><td>√</td><td>√</td><td>√</td><td>√</td><td>√</td><td>√</td></tr>
<tr><td>2. Final examination</td><td>60%</td><td>√</td><td>√</td><td>√</td><td>√</td><td>√</td><td>√</td><td>√</td><td>√</td><td>√</td></tr>
<tr><td>Total</td><td>100%</td><td colspan="9"></td></tr>
</table>

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

Overall Assessment:

0.4 × Continuous Assessment + 0.6 × Final Examination

The continuous assessment (40%) is aimed at enhancing the students' comprehension and assimilation of various topics of the syllabus via assignment. The final examination (60%) will also be</td></tr>
</table>

	considered to assess the students learning outcome.	
Student Study Effort Expected	Class contact:	
	▪ Lecture	39 Hrs.
	Other student study effort:	
	▪ Self-study	66 Hrs.
	Total student study effort	105 Hrs.
Reading List and References	1. Anyafo, A. (2018). Buy or Lease Decision in Fixed Assets Acquisition in the Nigerian Civil Aviation Industry. Journal of Administration, 1(1). 2. Coulter, J. M., Redpath, I. J., & Vogel, T. J. (2018). Leasing Agreements in the Airline Industry: A Case Study Examining the Impact of Asu 2016-02. Journal of Business and Educational Leadership, 7(1), 114-123. 3. Donald H. Bunker. International Aircraft Financing (Volume 1 – General Principles and Volume 2 – Specific Documents). 4. Gillen, D., & Morrison, W. G. (2015). Aviation security: costing, pricing, finance and performance. Journal of Air Transport Management, 48, 1-12. 5. Keaveny, C., & Murray, S. (2013). Aviation finance and leasing. Offshore Investment, 239, 12-14. 6. Mann, E. D. (2009). Aviation finance: An overview. Journal of Structured Finance, 15(1), 109. 7. Murphy, R., & Desai, N. (Eds.). (2011). Aircraft financing. Euromoney Books. 8. Morrell, P. S. (2013). Airline finance. Ashgate Publishing, Ltd. 9. Vasigh, B., Fleming, K., & Humphreys, B. (2014). Foundations of airline finance: Methodology and practice. Routledge. 10. Vitaly S. Guzhva, Sunder Raghavan, Damon J. D'Agostino (2018). Aircraft Leasing and Financing: Tools for Success in International Aircraft Acquisition and Management. Elsevier Science. 11. Wensveen, J. (2018). Air transportation: A management perspective. Routledge. 12. Kinnison, Harry A., and Tariq "Terry" Siddiqui (2013). "*Aviation Maintenance Management*. 2nd ed. New York: McGraw-Hill Education.	

Subject Description Form

Subject Code	AAE5110
Subject Title	Air Transport Economics and Policy
Credit Value	3
Level	5
Pre-requisite/ Co-requisite/ Exclusion	Nil
Objectives	This subject will provide students with 1. an advanced understanding of the economic principles and theories that underpin the air transport industry and its regulation; 2. a critical analysis of the current issues and challenges facing the air transport sector, such as market structure, competition, pricing, demand, supply, externalities, social costs and benefits, and sustainability; 3. an appreciation of the role and impact of various policies and institutions that shape the air transport environment, such as international agreements, open skies, alliances, mergers, subsidies, taxation, and environmental regulation; and 4. an opportunity to apply the economic concepts and tools to evaluate and propose solutions for real-world problems and cases in the air transport industry.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a. understand economic principles and concepts relevant to air transport. b. analyze the economic impact of air transport on economies and interconnected sectors. c. evaluate and propose improvements to air transport policy frameworks. d. apply economic and policy analysis to address industry challenges and propose evidence-based recommendations for performance and sustainability.
Subject Synopsis/ Indicative Syllabus	**Introduction to Air Transport Economics:** The role and importance of air transport in the global economy; key economic concepts such as opportunity cost, the value of money, supply and demand, imperfect markets, market systems (monopoly, oligopoly), game theory, quantity control, and taxation; the characteristics and structure of the air transport market; the

<table>
<tr><td></td><td>economic models and tools for analysing the air transport market.

Air Transport Cost and Production: The components and determinants of air transport costs; the economies of scale and scope in air transport production; the cost and production functions and their properties; the productivity and efficiency measures and indicators for air transport.

Air Transport Pricing and Revenue Management: The pricing strategies and methods in the air transport industry; the revenue management and optimization models and practices; the price competition and collusion among airlines.

Air Transport Market Structure and Competition: The market structure and conduct of the air transport industry; the impacts of market power and competition on air transport performance and welfare; the antitrust and competition policies and regulations for the air transport industry.

Air Transport Externalities and Social Costs: The external effects and social costs of air transport activities; macroeconomic effects such as AD-AS model, cost of inflation, GDP, and unemployment rate; the environmental impacts of air transport such as noise, emissions, and climate change; the social cost-benefit analysis of air transport projects and policies.

Air Transport Policy and Regulation: The objectives and instruments of air transport policy and regulation; the evolution and development of air transport policy and regulation; liberalisation in aviation market, airport privatisation, export/import policy, military control policy, US-Sino relationship, and globalisation; the impacts and implications of air transport policy and regulation on air transport performance and welfare.</td></tr>
<tr><td>Teaching/Learning Methodology</td><td>Teaching is conducted through class lectures and tutorials. Lectures are aimed at delivering the core knowledge and concepts of air transport economics and policy and policy regulations relevant to air transport. Tutorials are used to reinforce the understanding and application of the economic concepts and tools through exercises and discussions.

<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>Lecture</td><td>√</td><td>√</td><td>√</td><td>√</td></tr>
<tr><td>Tutorial</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 (Please tick as appropriate)			
		a	b	c	d
1. Assignment	30%	√			√
2. Group project	20%	√	√	√	√
3. Final examination	50%	√	√	√	√
Total	100 %				

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

Overall Assessment:

0.5 × Continuous Assessment + 0.5 × Final Examination

The continuous assessment (50%) is designed to enhance the students' comprehension and assimilation of various topics of the syllabus through assignments and projects. In particular, the assignments will evaluate students' understanding of economic principles and concepts relevant to air transport, as well as their ability to apply economic and policy analysis to address challenges in this field. Additionally, the group projects will assess students' capacity to apply economic and policy analysis to solve real-world cases. The final examination (50%) will also evaluate the students' learning outcome. The final examination will test the students' comprehension of economic and policy analysis related to air transport.

Student Study Effort Expected		
	Class contact:	
	▪ Lecture	39 Hrs.
	Other student study effort:	
	▪ Self-learning/preparation	36 Hrs.
	▪ Literature study/case study/reading	36 Hrs.
	Total student study effort	111 Hrs.

Reading List and References	1. Mankiw, N. Gregory. Principles of economics. Cengage Learning, 2020. 2. Mankiw, N. Gregory, Ronald D. Kneebone, Kenneth J McKenzie. Principles of Macroeconomics, Cengage Canada, 2023. 3. Holloway, Stephen. Straight and level: Practical airline economics. Ashgate Publishing, Ltd., 2008. 4. Morrell, Peter S. Airline finance. Routledge, 2021. 5. Vasigh, Bijan, Ken Fleming, and Thomas Tacker. Introduction to air transport economics: from theory to applications. Routledge, 2018. 6. Graham, Anne, et al., eds. Air Transport and Regional Development Policies. Routledge, 2020.

Nov 2023

Subject Description Form

Subject Code	AAE5201
Subject Title	Aerodynamics and Computational Fluid Dynamics
Credit Value	3
Level	5
Pre-requisite/ Co-requisite/ Exclusion	Nil
Objectives	1. To provide students with knowledge of aerodynamics and computational fluid dynamics (CFD). 2. To develop students' capability in theoretical and numerical analysis of canonical aerodynamic problems.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a. acquire fundamental knowledge of aerodynamics and CFD primarily in terms of inviscid flow; b. perform theoretical and numerical analysis of canonical aerodynamic problems; and c. gain basic understanding of state-of-the-art CFD techniques.
Subject Synopsis/ Indicative Syllabus	**Inviscid, incompressible flow**: Laplace equation and elementary solutions; Thin airfoil theory **Inviscid, compressible flow**: Shock and expansion waves; Quasi-one-dimensional flow; Linearized flow; Transonic flow; Hypersonic flow **Basics of numerics**: Finite differences; Difference equations; Stability analysis **Numerical techniques for incompressible flow**: Pressure correction technique **Time-marching techniques for compressible flow**: Lax–Wendroff technique; MacCormack's technique; Stability criterion **Modern CFD techniques**: Upwind schemes; Limiters; Total variation diminishing; Implicit methods

Teaching/Learning Methodology

The teaching and learning methods include lectures and tutorials, which are aimed at providing students with integrated knowledge required for aerodynamics and CFD. Technical/scientific examples and problems will be presented and discussed.

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

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. Homework	30%	√	√	√
2. Test	20%	√	√	
3. Final examination	50%	√	√	
Total	100%			

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

Overall Assessment:

0.5 × Continuous Assessment + 0.5 × Final Examination

The continuous assessment consists of homework and test, which 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 final examination is used to assess the knowledge acquired by the students for understanding and analysing 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.
▪ Tutorial	6 Hrs.
Other student study effort:	
▪ Self-learning	30 Hrs.

	▪ Homework	40 Hrs.
	Total student study effort	109 Hrs.
Reading List and References	1. Anderson J. D., Fundamentals of Aerodynamics. McGraw-Hill, 6th edition. 2. Anderson J. D., Computational Fluid Dynamics: The Basics with Applications. McGraw-Hill, 1st edition. 3. Bertin J. J. and Cummings R. M., Aerodynamics for Engineers. Pearson, 6th edition.	

July 2023

Subject Description Form

Subject Code	AAE5202
Subject Title	Advanced Aircraft Structures and Materials
Credit Value	3
Level	5
Pre-requisite/ Co-requisite/ Exclusion	Exclusion: ME577 Advanced Aircraft Structures
Objectives	1. To provide students an overview of the structures in modern aircraft. 2. To provide students with tools that are needed to formulate and solve problems concerning compression/tension, bending, torsion and buckling in aircraft structures. 3. To provide students with an overview of the advanced materials that are used for aircraft vehicles. 4. To provide students with an overview of the non-destructive testing techniques that are used to ensure the safe operation of aircraft vehicles.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a. perform stress analysis for typical aircraft structural components using both analytical methods and computational tools; b. obtain in-depth understanding of the mechanical behavior of the materials that are used for aircraft vehicles; c. choose the non-destructive testing methods that best suit certain aerospace structural components; and d. recognize the frontier of research in aircraft structures and materials.
Subject Synopsis/ Indicative Syllabus	**Structures**: Fuselage; Wing; Tail; Landing gear; Thin-wall beams; Tapered beams; Ribs; Cut-outs; Loads applied on airframes; Stress analysis of aircraft structural components **Materials**: Typical aircraft materials and material characteristics; Characteristics of composite materials **Non-destructive testing and evaluation of aircraft structures (NDT&E)**: Finite element method (FEM) for the analysis of aircraft structures

Teaching/Learning Methodology

Lectures, tutorials and guided study by project/case study/literature survey are used to deliver the fundamental knowledge and research elements in relation to aircraft structures and materials.

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

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
2. Take-home assignments and/or in-class quizzes	40%	√	√	√	√
3. Final examination	60%	√	√	√	√
Total	100%				

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

Overall Assessment:

$$0.4 \times \text{Continuous Assessment} + 0.6 \times \text{Final Examination}$$

The assignments and quizzes are used to assess the students' understanding of the stress analysis methods and their capabilities of mathematical problem formulation and programme application for typical aircraft structures. The final examination will be conducted to evaluate the students' performance in all the topics of the syllabus with a limited examination time.

Student Study Effort Expected		
	Class contact:	
	▪ Lecture	39 Hrs.
	Other student study effort:	
	▪ Self-learning	45 Hrs.
	▪ Project report preparation	22 Hrs.

	Total student study effort	106 Hrs.
Reading List and References	1. Sun C. T., Mechanics of Aircraft Structures, John Wiley & Sons, latest edition. 2. Megson, T. H. G., Aircraft Structures for Engineering Students, Elsevier, latest edition. 3. Gibson, R. F., Principles of Composite Material Mechanics, McGraw-Hill, International Editions, latest edition.	

Jun 2024

Subject Description Form

Subject Code	AAE5203
Subject Title	Aircraft Design and Certification
Credit Value	3
Level	5
Pre-requisite/ Co-requisite/ Exclusion	Exclusion: ME578 Aircraft Design
Objectives	1. To provide students with the key knowledge relevant to the process and principle of aircraft design, and the capacity to formulate the design requirements for an aircraft using modern engineering tools. 2. To provide students with the multi-disciplinary design optimization (MDO) knowledge to conduct aircraft system optimization from aerodynamics, propulsion, structure, stability, and performance perspectives. 3. To provide students with the knowledge about aircraft certification process and requirement.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a. understand fundamental concepts and constraints during an aircraft design process; b. evaluate common aircraft configurations; c. design and layout aircraft major components; d. design and sizing aircraft that meets aerodynamic requirements; e. optimize the aircraft design process by multi-disciplinary design optimization principles; and f. understand airworthiness and aircraft certification process during an aircraft design.
Subject Synopsis/ Indicative Syllabus	**Introduction to Aircraft Design*:*** Design process and basic aircraft requirements; Evolution of aircraft design and its performance: a brief history; Overview of aircraft design iteration cycle **Modern Aircraft Configuration:** Advantages and drawbacks of conventional and modern configurations; Considerations for special aircraft; Primary considerations for the fuselage, wing, and tail design **Aerodynamic Consideration of Aircraft Design:** Fundamentals of aerodynamic; Friction and pressure drag; Airfoil; Finite wings;

<table>
<tr><td></td><td>Drag and lift; Dependence of lift and drag on the angle of attack; End effects of wingtips; Induced drag

Sizing and Costing: Internal layout; Structures and weight; Geometry constraints; Sizing equation; Weight fraction method; Weight and balance; Cost analysis; Elements of life-cycle cost; Cost-estimating methods; Operations and maintenance costs; Cost measures of merit

Main Components Selection and Design: Selection and design of main components such as fuselage, wing, tail and landing gear; Calculation and design of control surfaces such as aileron, elevator and rudder

Multi-disciplinary Design Optimization (MDO): uses optimization methods to solve design problems incorporating a number of disciplines

Aircraft certification and Airworthiness: Airworthiness requirements; Load factor determination; Aircraft safety; Airframe loads; Designing against fatigue; Prediction of aircraft fatigue life</td></tr>
<tr><td>Teaching/Learning Methodology</td><td>Lectures are used to deliver the fundamental knowledge in relation to aircraft design. Tutorials and case study are used to illustrate the application of fundamental knowledge to practical situations.

<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>e</td><td>f</td></tr>
<tr><td>Lecture</td><td>√</td><td></td><td>√</td><td>√</td><td></td><td>√</td></tr>
<tr><td>Tutorial/Case Study</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 (Please tick as appropriate)</td></tr>
<tr><td>a</td><td>b</td><td>c</td><td>d</td><td>e</td><td>f</td></tr>
<tr><td>1. Assignment/Test</td><td>20%</td><td>√</td><td>√</td><td></td><td>√</td><td>√</td><td>√</td></tr>
<tr><td>2. Design Project</td><td>30%</td><td>√</td><td>√</td><td>√</td><td>√</td><td>√</td><td>√</td></tr>
<tr><td>3. 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 assessing the intended learning outcomes:</td></tr>
</table>

	Overall Assessment: 0.5 × Continuous Assessment + 0.5 × Final Examination Examination is adopted to assess students on the overall understanding and the ability of applying the concepts. It is supplemented by continuous assessment including assignment, closed-book test and design project. The continuous assessment is aimed at enhancing the students' comprehension and assimilation of various topics of the syllabus. Design project is used to assess the students' capacities of self-learning and problem-solving and effective communication skill in English to fulfil the requirements of being aircraft design engineers.	
Student Study Effort Expected	Class contact:	
	▪ Lecture	33 Hrs.
	▪ Tutorial/case study	6 Hrs.
	Other student study effort:	
	▪ Course work and design project	42 Hrs.
	▪ Self-study	25 Hrs.
	Total student study effort	106 Hrs.
Reading List and References	1. Raymer D., Aircraft Design: A Conceptual Approach. American Institute of Aeronautics and Astronautics, Inc., 2018. 2. Torenbeek E., Advanced Aircraft Design: Conceptual Design, Technology and Optimization of Subsonic Civil Airplanes, John Wiley & Sons, 2013. 3. Raymer D., Enhancing Aircraft Conceptual Design Using Multidisciplinary Optimization, Swedish Royal Institute of Technology (KTH), 2002.	

July 2023

Subject Description Form

Subject Code	AAE5204
Subject Title	Autonomous Flight - Mechanics and Control
Credit Value	3
Level	5
Pre-requisite/ Co-requisite/ Exclusion	Nil
Objectives	1. To provide students with the key knowledge relevant to the flight mechanics, dynamics, and control. 2. To provide students with the capacity to formulate the flight control system by using modern engineering tools and algorithms. 3. To provide students with the knowledge about intelligent planning and control methods to achieve autonomous flight for manned or unmanned aircraft.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a. understand fundamental concepts aircraft coordinate systems and forces; b. able to analysis the longitudinal and lateral direction flight mechanics; c. evaluate aircraft flight stability, controllability and handling quality; d. understand classic and modern flight control system; e. understand search-based and sample-based planning methods and trajectory generation methods; and f. extend their knowledge to analyse and develop new modules or algorithms for desired autonomous flight by flight simulation.
Subject Synopsis/ Indicative Syllabus	**Aircraft Six Degrees of Freedom (6-DOF) Equations of Motion:** Aircraft coordinate systems; Kinematic model; Dynamic model; Propulsion system model; Model linearization method **Longitudinal and Lateral Flight Dynamics and Control**: Longitudinal motion and mode approximations; Lateral motion and mode approximations; Handling quality **Classic and Modern Flight Control System**: Classic flight control system; Modern flight control system; State space modelling; Stability, controllability and observability; State feedback design and optimal control

<table>
<tr><td></td><td>Planning for Autonomous Flight: Global path planning methods including search-based methods and sample-based methods; Local smooth trajectory generation methods

Autopilot System Integration and Flight Simulation: Open-source flight controller; Flight simulation platform; Programming and hardware interface; Implementation of control and planning algorithms; Introduction to autonomous aerial robotic system</td></tr>
<tr><td>Teaching/Learning Methodology</td><td>The teaching and learning methods include lectures, assignment, test, mini project and examination. The tutorials and case study are aimed at providing students with integrated knowledge required for unmanned aircraft systems. Technical/practical examples and problems will be raised and discussed in class/hands on sessions.
<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>e</td><td>f</td></tr>
<tr><td>Lecture</td><td>√</td><td>√</td><td>√</td><td>√</td><td>√</td><td>√</td></tr>
<tr><td>Tutorial/Case Study</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 (Please tick as appropriate)</td></tr>
<tr><td>a</td><td>b</td><td>c</td><td>d</td><td>e</td><td>f</td></tr>
<tr><td>1. Assignment/Test</td><td>20%</td><td>√</td><td>√</td><td>√</td><td>√</td><td>√</td><td></td></tr>
<tr><td>2. Mini Project</td><td>30%</td><td>√</td><td>√</td><td></td><td>√</td><td>√</td><td>√</td></tr>
<tr><td>3. 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 assessing the intended learning outcomes:
Overall Assessment:
0.5 × Continuous Assessment + 0.5 × Final Examination
Examination is adopted to assess students on the overall understanding and the ability of applying the concepts. It is supplemented by continuous assessment including assignment, closed-book test and mini-project. The continuous assessment is aimed at enhancing the students' comprehension and assimilation</td></tr>
</table>

	of various topics of the syllabus. Mini-project is used to assess the students' capacities of self-learning and problem-solving and effective communication skill in English so as to fulfil the requirements of being aircraft design engineers.	
Student Study Effort Expected	Class contact:	
	▪ Lecture	30 Hrs.
	▪ Tutorial/case study	9 Hrs.
	Other student study effort:	
	▪ Course work and mini project	42 Hrs.
	▪ Self-study	25 Hrs.
	Total student study effort	106 Hrs.
Reading List and References	1. Pamadi B.N. Performance, stability, dynamics, and control of airplanes. AIAA, 2015. 2. Stevens B.L., Lewis F.L., Johnson E.N., Aircraft Control and Simulation: Dynamics, Controls Design, and Autonomous Systems, Wiley, 2015. 3. Nonami K., Kendoul F., Suzuki S., Wang W., Nakazawa D., Autonomous flying robots: unmanned aerial vehicles and micro aerial vehicles, Springer, 2010.	

July 2023

Subject Description Form

Subject Code	AAE5205
Subject Title	Aircraft Engine Systems and Combustion
Credit Value	3
Level	5
Pre-requisite/ Co-requisite/ Exclusion	Nil
Objectives	To provide students with fundamental knowledge of advanced aircraft engine systems and combustion sciences and their applications 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 areas of aircraft propulsion systems and combustion sciences; b. apply their knowledge, skills and hand-on experience to the design and analysis of aircraft propulsion and combustion systems; c. extend their knowledge of aeronautical engineering to different situations of engineering context and professional practice in propulsions and combustion 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 thermodynamics**: Mass, momentum and energy conservation laws; Thermal properties; First Law of Thermodynamics; *p*-*v*-*T* relation; Ideal gas model; Kelvin-Planck and Clausius statements; Reversible and irreversible processes; Carnot cycle; Clausius inequality; Entropy; Isentropic processes; Isentropic efficiencies; Brayton cycle. **Steady-state, one-dimensional (1-D), compressible flow**: Quasi-1-D flow of perfect gas; Isentropic and non-isentropic flow; Stagnation concept; Nozzle equations. **Propulsion basics**: Thrust equations; Thermal and propulsion efficiencies; Fuel consumption rate and specific thrust; Engine performance; Aircraft range. **Cycle analysis and engine performances**: Turbojet, turbofan, turboprop and turbo-shaft engines. **Subsystems –** Inlets; Turbomachinery: basics of compressors and turbines; Combustors; Nozzles.

<table>
<tr><td></td><td>Modern aircraft engines: High-by-pass engines.
Introduction to Combustion: Combustion modes and flame types; Stoichiometric and equivalence fuel-air ratio; Complete, lean & rich combustion; Elementary of chemical kinetics; Combustor types; Combustor design and flame-holders.</td></tr>
<tr><td>Teaching/Learning Methodology</td><td>The teaching and learning methods include lectures, homework assignment, test, and examination. Technical/practical examples and problems will be raised and discussed in class. Project is designed to evaluate the aircraft engine systems.
<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>Lecture</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 (Please tick as appropriate)</td></tr>
<tr><td>a</td><td>b</td><td>c</td><td>d</td></tr>
<tr><td>1. Project</td><td>25%</td><td>√</td><td>√</td><td>√</td><td>√</td></tr>
<tr><td>2. Homework assignment</td><td>25%</td><td>√</td><td>√</td><td>√</td><td>√</td></tr>
<tr><td>3. Final examination</td><td>50%</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 × Continuous Assessment + 0.5 × Final Examination
The continuous assessment consists of project, homework assignments and tests. 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 analysing the problems critically and independently; as well as to determine the degree of achieving the subject learning outcomes.</td></tr>
</table>

Student Study Effort Expected	Class contact:	
	▪ Lecture	39 Hrs.
	Other student study effort:	
	▪ Self Study	67 Hrs.
	Total student study effort	106 Hrs.
Reading List and References	1. Thermodynamics: An Engineering Approach, 8th Edition, 2014, by Yunus A. Cengel and Michael A. Boles. McGraw-Hill Education 2. Fluid Mechanics: Fundamentals and Applications, 4th Edition, 2018. Cengel, Y. & Cimbala, J., McGraw-Hill Education 3. Elements of Propulsion: Gas Turbine and Rockets, 2nd Edition, 2006. Jack Mattingl., AIAA. 4. The Jet Engine, 5th Edition, Rolls Royce, Wiley 5. An Introduction to Combustion: Concepts and Applications, 4th Edition, 2021. Turns, S. et al., McGraw Hill. 6. A Gallery of Combustion and Fire, 1st Edition, 2020. Agarwal, A. et al., Cambridge University.	

Jun 2024

Subject Description Form

Subject Code	AAE5206
Subject Title	Artificial Intelligence in Aerospace Engineering
Credit Value	3
Level	5
Pre-requisite/ Co-requisite/ Exclusion	Nil
Objectives	The objectives of this subject are to: 1. introduce the principles, concepts and models of most popular deep learning algorithms used in aerospace research and industry. 2. provide both theoretical and practical understanding of machine learning models such as deep neural networks. 3. develop proficiency in designing, training, and optimizing machine learning models using Python and PyTorch.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a. understand the fundamental principles and algorithms of artificial intelligence models. b. develop insights into the effectiveness and applicability of artificial intelligence techniques in the aerospace industry. c. gain knowledge of applying artificial intelligence techniques to various cutting-edge aerospace applications. d. design innovative artificial intelligence solutions to address complex challenges in aerospace engineering, considering various requirements and constraints. e. participate effectively in teamwork, presentation, and technical writing, enhancing collaboration and communication skills.
Subject Synopsis/ Indicative Syllabus	**Supervised Learning in Aerospace:** Introduction to supervised learning with aerospace applications. Topics include concept learning, supervised learning algorithms (SVM, k-NN, linear discriminant analysis, naïve Bayes, decision trees, neural networks, multi-layer perceptron), and evaluation metrics. Emphasis on handling high-dimensional data and model selection in aerospace contexts. **Unsupervised Learning for Aerospace Data Analysis:** Exploration of unsupervised learning techniques for aerospace data. Includes dimensionality reduction, feature selection, and clustering algorithms (k-means, mixture models, hierarchical clustering). Discussion on anomaly detection in aerospace systems and neural network-based approaches (Hebbian learning, deep

<table>
<tr><td></td><td>belief networks, self-organizing maps) for pattern recognition.

Semi-supervised Learning in Aerospace Applications:
Integration of supervised and unsupervised learning for aerospace applications. Covers continuity and manifold assumptions, generative models, graph-based methods, and low-density separation. Emphasis on leveraging unlabeled data for improved model performance in aerospace engineering.

Reinforcement Learning for Aerospace Control Systems:
Introduction to reinforcement learning with a focus on aerospace control systems. Topics include algorithms for control learning, optimality criteria, value functions, directed policy search, and deep reinforcement learning. Application of inverse reinforcement learning and apprenticeship learning in autonomous aerospace systems.

Data Analytics and Machine Learning Applications in Aerospace:
Application of data analytics and machine learning in aerospace. Covers pattern discovery, topic modeling, genomics, and prediction in aerospace contexts. Discussion on scalability, interpretability, and legal/social/ethical considerations in aerospace data analytics.</td></tr>
<tr><td>Teaching/Learning Methodology</td><td>The course employs a combination of lectures, tutorials, lab sessions, and a group project to facilitate learning. Lectures provide comprehensive coverage of the course concepts, supplemented by examples and interactive question & answer sessions for clarity. Tutorials and lab sessions reinforce theoretical knowledge with practical exercises, emphasizing hands-on experience with machine learning tools and techniques. The group project engages students in collaborative work to apply theoretical concepts to real-world scenarios, enhancing their analytical and problem-solving 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="5">Intended subject learning outcomes to be assessed (Please tick as appropriate)</td></tr>
<tr><td>a</td><td>b</td><td>c</td><td>d</td><td>e</td></tr>
<tr><td>1. Assignments</td><td>20%</td><td>√</td><td>√</td><td>√</td><td>√</td><td></td></tr>
<tr><td>2. Quizzes</td><td>30%</td><td>√</td><td>√</td><td>√</td><td>√</td><td></td></tr>
<tr><td>3. Application Development</td><td>20%</td><td>√</td><td>√</td><td>√</td><td>√</td><td>√</td></tr>
</table>
</td></tr>
</table>

	4. Project Report	20%	√	√	√		√
	5. Project Presentation	10%	√	√	√		√
	Total	100 %					

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

Continuous assessments in this course consist of assignments, quizzes, application development, project reports, and project presentations, each designed to facilitate students in achieving the intended learning outcomes. Assignments are crafted to encourage students to acquire a good understanding of machine learning models and algorithms, providing opportunities for practice to enrich their hands-on experience with various software tools and ensuring they develop insights into the effectiveness of machine learning techniques. Quizzes are utilized to ensure that students grasp the essential concepts and can apply machine learning techniques to various cutting-edge applications, helping to assess their theoretical knowledge. Application Development is aimed at enhancing students' abilities to use different knowledge, principles, techniques, and tools to solve real-world problems in aerospace engineering, assessing their capacity to design machine learning solutions considering various requirements and issues. The Project Report allows students to demonstrate their understanding and application of machine learning techniques comprehensively, assessing their ability to analyze data, present findings, and critically evaluate their work. The Project Presentation assesses students' ability to communicate their work effectively, showcasing their teamwork, presentation, and technical writing skills, and provides an opportunity for them to demonstrate their analytical and problem-solving skills through system implementation and interpersonal communication. The continuous assessment evaluates students' overall understanding and usage of machine learning and data analytics techniques, ensuring they have a solid foundation in the subject matter.

Student Study Effort Expected	Class contact:	
	▪ Lecture/Tests	26 Hrs.
	▪ Laboratory/Tutorial	13 Hrs.
	Other student study effort:	
	▪ Assignments, Projects, Quizzes	36 Hrs.
	▪ Literature Review, Self-study & Preparation	36 Hrs.

	Total student study effort	111 Hrs.
Reading List and References	1. Zhang A, Lipton ZC, Li M, Smola AJ. Dive into deep learning. Cambridge University Press, 2023. 2. Ian Goodfellow, Deep Learning, MIT, 2016. 3. Jared Dean, Big Data, Data Mining, and Machine Learning: Value Creation for Business Leaders and Practitioners. Wiley, 2014. 4. EMC Education Services (Editor), Data Science and Big Data Analytics: Discovering, Analyzing, Visualizing and Presenting Data, Wiley, 2015. 5. Christopher Bishop, Pattern Recognition and Machine Learning, Springer, 2006. 6. Deisenroth MP, Faisal AA, Ong CS. Mathematics for machine learning. Cambridge University Press; 2020 Apr 23. 7. Generative Artificial Intelligence Projects 2024 updated: https://github.com/sindresorhus/awesome-chatgpt	

May 2024

Appendix

REGULATIONS

Aug 2024

TABLE OF CONTENTS

Note: The academic regulations described in this document are based on the information known as of July 2024. 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: https://www.polyu.edu.hk/ar/students-in-taught-programmes/student-handbook/).

For ease of reading only the masculine pronoun has been used throughout this booklet. Women staff members and students should not take the omission of 'she', 'her' or 'hers' as being other than an editorial convenience.

PROGRAMMAE REGULATIONS

1. A Student's Programme of Study

1.1 On admission, students are registered on a Master's Degree (MSc). Students satisfactorily completing a set of subjects in accordance with the given regulations for a specific award will be eligible for a Postgraduate Diploma (PgD) exit award or a Master's degree award with that specific award title. Students are required to accumulate 19 and 31 credits in order to be eligible for a PgD exit award and a Master's degree award with a specific award title respectively. Students may be given credit transfer for appropriate study they have earlier successfully undertaken at postgraduate level (See Section 4).

1.2 Unless stated otherwise, a Master's degree consists of a dissertation component, which is normally worth 9 credits. A non-dissertation option is available to students who, instead of doing the dissertation, can take taught subjects with total credits equal to that of a dissertation.

1.3 The programme provides an option for students to engage in a full-time (9 credits or more per semester) or part-time study load (less than 9 credits per semester). Full-time students normally take 3 to 5 subjects in a semester, and part-time students usually take 2 subjects. Students may have their study load vary from semester to semester which will accordingly affect their entitlement to University's services.

1.4 The subjects are mostly run in the evenings/on weekends, but some elective subjects may be made available during the day. Classes can also be arranged with such alternatives as full-time weekends or full-time weekdays.

2. The Subject

2.1 The syllabus and/or level of treatment for all subjects in the programme is postgraduate in standard. Each subject offered is subject to a process of review and approval which looks for the achievement of an appropriate standard in terms of subject matter, teaching approach and professional standing of the subject teachers. The aim is the provision of the best possible programme in each field presented by subject teachers who are expert in the field rather than offering a multiplicity of programmes by different departments covering similar material. Teaching methods for each subject will vary to suit the nature of the material. However, all subjects require a similar amount of student effort. All subjects are first and foremost designed for students with experience and are of high standard in terms of relevance to modern practice, up-to-date content and intellectual challenge.

2.2 The size of the standard subject which is the building block of the programme is defined in terms of the approximate total time which would need to be spent by an average postgraduate student. The effort required of a student on one subject is equivalent to 4 weeks of full-time study, i.e. a total of about 105 hours (which includes class- contact time). On passing (i.e. obtaining a grade "D" or above) a standard subject, the student earns 3 credits. Exceptionally, there can be subjects which are not equivalent to 3 credits.

3. Pre-requisites, Co-requisites, Exclusions and Exemptions

3.1 Certain subjects can be specified as "pre-requisites" for a particular subject, in which case the subject titles and code numbers of the pre-requisites will be specified in the subject description form. Students would not be allowed to take that subject unless they have completed and passed the pre-requisite subjects, or unless they have obtained express approval from the subject teacher.

3.2 By definition, a subject and its co-requisite must be taken in the same semester.

3.3 In the case that two subjects overlap significantly in content, they can each be specified as ‘Exclusion’ of each other. Students having completed one of these subjects will not be allowed to take the ‘Exclusion’ subject. Exclusions, if completed, will not be counted towards award requirement.

3.4 Students may be exempted from taking any specified 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. Subject exemption is normally decided by 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 requirement for the award.

4. Credit Transfer

4.1 At the discretion of the subject offering Department and on the recommendation of the Chairman of Departmental Postgraduate Programme Committee, students admitted to the programme may be given credit for previous postgraduate study. A fee will be charged for credits successfully transferred. Transferred credits may not normally be counted towards more than one degree[1].

4.2 Normally, the grades achieved in subjects taken as part of a PolyU postgraduate award for which credit transfer is approved may contribute towards the students' Grade Point Average (GPA). Grades achieved for postgraduate study which was not part of a PolyU programme will not contribute towards the students' GPA (credit transfer without the grade carried). The credits transferred will count towards the credit requirement for the award. 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 add/drop period for a particular semester will only be eligible for graduation at the end of that semester, even if the granting of the credit transfer will immediately enable the student to satisfy the total credit requirement for the award.

4.3 The validity period of subjects earned is eight years from the year of attainment, i.e. the year in which the subject is completed, unless otherwise specified by the department responsible for the content of the subject. Credits earned from previous study should remain valid at the time when the student applies for transfer of credits. For exceptional cases such as those stated in 4.3.1 to 4.3.2 below, subject offering departments shall have the discretion to approve the transfer of credits which have exceeded the validity period of subject credits on a case-by-case basis. All such exceptional cases must be reported to the Faculty Board with full justification.

4.3.1 Mature learners for whom their previous studies were mostly completed a long time before their admission to PolyU, but who have working experience which would have kept them actively involved in the relevant area of study. The flexibility to be granted to these students based on academic comparability of subjects is in line with the policy of the University in promoting life-long learning.

4.3.2 Students for whom the expiry of validity of credits is beyond their control such as medical reasons.

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.

4.5 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.

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.

4.7 Students should not be granted credit transfer for a subject which they have attempted and failed in their current study unless the subject was taken by the student as an exchange-out student in his current programme.

[1] Credit transfer from undergraduate studies to postgraduate studies will be allowed on the condition that these credits were on top of the baccalaureate requirements.

5. Registration Period/Study Load/Academic Probation/Deregistration

Normal duration for completion of a programme

5.1 Students should complete the programme within the normal duration of the programme. Those who exceed the normal duration of the programme will be de-registered from the programme unless prior approval has been obtained from relevant authorities. The study period of a student shall exclude deferment granted for justifiable reasons, and the semester(s) when the student has been approved to undertake internship. Any semester in which the students are allowed to take zero subject will be counted towards their total period of registration.

5.2 Students who have been registered for the normal duration of the programme may request extension of their studies for up to one year with the approval of the relevant Heads of Department. Applications for extension of study period beyond one year and up to two years will require the approval from Faculty Board Chairman.

5.3 For part-time Taught Postgraduate Programmes, the Heads of Department may approve the extension of studies up to two years, and Faculty Board Chairman may approve the extension of studies beyond two years and up to four years.

5.4 Students who have exceeded the normal duration of the programme for more than two years (four years for part-time Taught Postgraduate Programmes) and have been de-registered can submit an appeal to the Academic Appeals Committee to request further extension. If the appeal fails, the student shall be de-registered.

Study Load

5.5 Unless exceptional approval is given, the maximum study load to be taken by a student in a semester is 21 credits. For such cases, students should be reminded that the study load approved should not be taken as grounds for academic appeal.

Academic Probation

5.6 Students who have a Grade Point Average (GPA) (See Section 13) lower than 1.70 will be put on academic probation in the following semester. Once when these students are able to pull their GPA up to 1.70 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 transcript of studies.

5.7 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 is decided by the programme host and subject to the approval of the relevant authorities.

Deregistration

5.8 Students will cease to be registered for the Master's award if:

5.8.1 they have reached the final year of the normal period of registration, unless approval has been given for extension; or

5.8.2 they have reached the maximum number of retakes allowed for a failed compulsory subject; or

5.8.3 they fail to register on any subject in a semester without obtaining approval[2]; or

5.8.4 their GPA is lower than 1.70 for two consecutive semesters and their Semester GPA in the second semester is also below 1.70; or

5.8.5 their GPA is lower than 1.70 for 3 consecutive semesters; or

5.8.6 they are granted the Master's award / PgD exit award.

When a student falls within any of the categories as stipulated above, except for 5.8.1 with approval for extension and 5.8.6, the Board of Examiners shall de-register the student from the programme without exception.

5.9 Those students who fall into any of the categories stated in Sections 5.8.1, 5.8.2, 5.8.4 and 5.8.5 above will be awarded a PgD exit award before being deregistered if they have satisfied the requirements for a PgD exit award.

5.10 Those students who do not fall into any of the categories stated in Section 5.8 above will have "progressing" status.

5.11 The progression of students to the following academic year will not be affected by the GPA obtained in Summer Term, if any.

5.12 A student may be deregistered from the programme enrolled before the time frame specified in Sections 5.8.4 and 5.8.5 if his academic performance is poor to the extent that the Scheme Board of Examiners deems that his chance of attaining a GPA of 1.70 at the end of the programme is slim or impossible.

[2] This does not apply if the student is enrolled on the dissertation.

6. Deferment of Study and Zero Subject Enrolment

6.1 A student may be allowed to interrupt his studies for a certain amount of time. This can be done by seeking either "deferment of study" or "zero subject enrolment". Both applications will have to be approved by the programme offering Department .

6.2 To apply for deferment of study, the student will have to provide strong justification for deferring his studies for one semester or longer. Deferment will normally be granted for no more than 2 semesters at a time. The total period of deferment cannot exceed 4 semesters. The deferment period will not be counted towards the total period of registration. 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. Students who have been approved for deferment are not entitled to enjoy any campus facilities during the deferment period.

6.3 Students must apply to the programme offering Department for not taking any subjects in a semester. Otherwise they will be classified as having unofficially withdrawn from their study. Zero subject enrolment will only be considered for one semester at a time. Prior approval must be obtained. Applications should be submitted before the commencement of the semester concerned or in exceptional circumstances before the end of the add/drop period. All semesters in which the students are allowed to take zero subjects will be counted towards the total period of registration. A fee for retention of study place will be charged.

7. Subject Registration/Adding and Dropping of Subjects/Withdrawal of Subjects

7.1 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 hosting department and will require the approval of both the subject teacher and the Programme Leader concerned. 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.

7.2 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.

7.3 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.

8. Dissertation and Dissertation Assessment

8.1 Academic supervisors, and professional supervisors (optional) are appointed by the Departmental Postgraduate Programme Committee. Students are expected to submit a dissertation proposal to the Departmental Postgraduate Programme Committee no later than the last teaching day of the semester in which he first registers for dissertation.

8.2 Students can register on dissertations only if they are co-taking and/or have taken a total of 3 taught subjects (including credit transferred subjects) in that semester. Students are required to pay for all of the 9 credits the dissertation carries in the first semester when he enrols on the dissertation. Fees paid will not be refunded even if the student withdraws from his dissertation or from the programme during the course of his registration. Students will be required to complete their dissertations within the normal period of 3 semesters. The minimum period for the dissertation work to be completed is 2 semesters. Those who are not able to complete their dissertation may apply on the advice of the supervisor to the Departmental Postgraduate Programme Committee for approval to extend the dissertation registration beyond the normal period but within the maximum period of 4 semesters. Applications for extension beyond the normal period will be considered by the programme offering Department and approved only under exceptional circumstances.

8.3 When permission is granted to extend the dissertation registration beyond the normal period, the student will be required to pay a 3-credit tuition fee for each additional semester.

8.4 Break of study is normally not permitted once a student registers for dissertation and students are expected to pursue their dissertation in consecutive semesters.

8.5 The assessment panel will consist of two categories of member, namely:

8.5.1 the supervisors (academic supervisor, and professional supervisor if relevant); and

8.5.2 a second assessor who is a subject expert from the department, from another department in the University, or from industry, to be nominated by the Departmental Postgraduate Programme Committee.

8.6 A copy of the dissertation should be sent to each of the assessors and one copy should be kept by the student.

8.7 After submission of the formal report the academic supervisor should make arrangements with the assistance of the department on a mutually convenient time and place for an oral examination at which the other assessors will be present. The date set for the oral examination should allow sufficient time for the examiners to read the submission and should normally be no later than one month after submission of the dissertation.

8.8 After conducting the oral examination the assessment panel will jointly allocate a grade guided by the following weightings which may vary depending on the nature of the project. Individual awards may modify key items and the recommended weightings according to the needs of each award.

Progress 20%	Dissertation 50%	Oral 30%	Total 100%

8.9 After the assessment of the dissertation is complete, the academic supervisor will write a report on the outcome using standard outline report forms. These reports must be signed by all who participated in the assessment of the dissertation and be forwarded to the Departmental Postgraduate Programme Committee.

8.10 The report will contain a date by which the student should submit his final dissertation and the number of hard and electronic copy required to the host Department which would arrange to send an electronic copy to the Library. The deadline for submission of the examination report to the Departmental Postgraduate Programme Committee is two weeks before the meeting of the Subject Assessment Review Panel.

8.11 Departments could at their discretion allow students to complete their dissertations during the summer break. In such cases these results could be processed by the Subject Assessment Review Panel held for the summer semester to allow students to graduate.

8.12 A set of operational guidelines on dissertation is attached at *Annex* for the reference of staff and students.

9. Assessment of Taught Subjects

9.1 The assessment regulations adopted conform to the University's General Assessment Regulations for taught programmes. The ultimate authority in the University for the confirmation of academic decisions is the Senate, but for practical reasons, Senate has delegated to the Faculty 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 the Board of Examiners which fall outside these Regulations shall be ratified by the Academic Planning and Regulations Committee and reported to Senate as necessary.

9.2 A variety of assessment methods, such as open book examinations, will be used. All other forms of assessment are included in the term coursework. This 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.

9.3 Assessment methods and parameters of subjects shall be determined by the subject offering Department. The assessment for a subject is based on one or two components, namely coursework and/or examination. The weighting of coursework and examination is shown in the individual subject description forms. 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 pass. Such requirements would be specified in the subject description forms. Learning outcome should be assessed by continuous assessment and/or examination appropriately, in line with the outcome based approach.

9.4 Assessment grades shall be awarded on a criterion-referenced basis. A student's overall performance in a subject shall be graded as follows:

Subject grade	***Short description***	***Elaboration on subject grading description***
A+ A A-	Excellent	Demonstrates excellent achievement of intended subject learning outcomes by being able to skillfully use concepts and solve complex problems. Shows evidence of innovative and critical thinking in unfamiliar situations, and is able to express the synthesis or application of ideas in a logical and comprehensive manner.
B+ B B-	Good	Demonstrates good achievement of intended subject learning outcomes by being able to use appropriate concepts and solve problems. Shows the ability to analyse issues critically and make well-grounded judgements in familiar or standard situations, and is able to express the synthesis or application of ideas in a logical and comprehensive manner.
C+ C C-	Satisfactory	Demonstrates satisfactory achievement of intended subject learning outcomes by being able to solve relatively simple problems. Shows some capacity for analysis and making judgements in a variety of familiar and standard situations, and is able to express the synthesis or application of ideas in a manner that is generally logical but fragmented.
D+ D	Pass	Demonstrates marginal achievement of intended subject learning outcomes by being able to solve relatively simple problems. Can make basic comparisons, connections and judgments and express the ideas learnt in the subject, though there are frequent breakdowns in logic and clarity.
F	Fail	Demonstrates inadequate achievement of intended subject learning outcomes through a lack of knowledge and/or understanding of the subject matter. Evidence of analysis is often irrelevant or incomplete.

9.5 "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'.

<u>Indicative descriptors for modifier grades</u>

Main Grade (solid)	The student generally performed at this level, indicating mastery of the subject intended learning outcomes at this level.
+ (exemplary)	The student consistently performed at this level and exceeded the expectations of this level in some regards, but not enough to claim mastery at the next level.
- (marginal)	The student basically performed at this level, but the performance was inconsistent or fell slightly short in some regards.

Note: The above indicative descriptors for modifier grades are not applicable to the pass grades D and D+

9.6 A numeral grade point is assigned to each subject grade.

The grade points assigned to subject grades attained by students are as follows:

Grade	***Grade Point for grades attained from 2020/21***
A+	4.3
A	4.0
A-	3.7
B+	3.3
B	3.0
B-	2.7
C+	2.3
C	2.0
C-	1.7
D+	1.3
D	1.0
F	0.0

10. Retaking of subjects

10.1 Students may only retake a subject which they have failed (i.e. Grade F or S or U). Retaking of subjects is with the condition that the maximum study load of 21 credits per semester is not exceeded.

10.2 The number of retakes of a subject should be restricted to two, i.e. a maximum of three attempts for each subject is allowed.

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.

10.4 Students need to submit a request to the Faculty Board for the second retake of a failed subject.

10.5 Students who have failed a compulsory subject after two retakes and have been de-registered can submit an appeal to the Academic Appeals Committee (AAC) for a third chance of retaking the subject.

10.6 In relation to 10.5 above, in case AAC does not approve further retakes of a failed compulsory subject or the taking of an equivalent subject with special approval from the Faculty, the student concerned would be de-registered and the decision of the AAC shall be final within the University.

11. Exceptional circumstances

11.1 Absence from an assessment component

11.1.1 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 normally 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 Board Chairman shall decide on an appropriate time for completion of the late assessment.

11.1.2 The student concerned is required to submit his 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 teacher concerned, in consultation with the Programme Leader.

11.2 Assessment to be completed

For cases where students fail marginally in one of the components within a subject, the BoE can defer making a 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.

11.3 Other particular circumstances

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

12. Eligibility for Award

12.1 A student would be eligible for award if he satisfies all the conditions listed below:

12.1.1 Accumulation of the requisite number of credits – 31 for MSc; 19 for PgD exit award; and

12.1.2 Satisfying the residential requirement for at least 1/3 of the credits to be completed for the award he is currently enrolled, unless the professional bodies stipulate otherwise; and

12.1.3 Satisfying all requirements as defined and/or stipulated for the respective awards and as specified by the University; and

12.1.4 Having a Grade Point Average (GPA) of 1.70 or above at the end of the programme[3];

12.1.5 Having successfully completed the Online Tutorial on Academic Integrity accessed via LEARN@PolyU (理學網); and

12.1.6 Satisfying the National Education (NE) requirement[4] as specified at: https://www.polyu.edu.hk/ous/nationaleducation/understanding-china-and-hongkong/.

12.2 The PgD exit award and Master's degree award are classified as: Distinction, Credit, and Pass.

12.3 A student is required to graduate as soon as he satisfies all the conditions for award (see Section 12.1 above). Subject to the maximum study load of 21 credits per

[3] For programmes leading to nested awards where satisfaction of the conditions leading to the lesser award is a subset of the conditions leading to the more advanced award, and where students opt to graduate with the lesser award when failing to complete the requirements for the more advanced award, subjects taken solely for fulfilling the requirements for the more advanced award may be excluded in the GPA calculation for the purpose of satisfying this condition (i.e. the student can graduate with the lesser award if the Award GPA of the lesser award can meet the minimum GPA requirement for graduation).

[4] All students enrolling on offshore programmes (regardless of their nationality) will be waived from the NE requirement. NE requirement can also be waived for students who are non-HK residents enrolling on online programmes on a case-by-case basis, i.e. if they submit a request to ask for a waiver. Waiver should not be granted to students enrolling on online programme who are residing in HK or have the right of abode in HK.

semester, a student may take more credits than he needs to graduate on top of the prescribed credit requirements for his award in or before the semester within which he becomes eligible for award.

12.4 A student, however, will not be granted the same PgD exit award (in the same area) for the second time despite his satisfying the conditions for award as stipulated in Section 12.1 above, if he has been granted the award before.

12.5 If a student's registration status has been set to "Study ended" due to non-compliance with PolyU regulations, for example, failure to pay fees, he will not be eligible for the award unless his registration status has been reinstated.

13. Grade Point Average (GPA)

13.1 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:

$$\text{GPA} = \frac{\sum_{n=1}^{N} \text{Subject Grade Point}_n \times \text{Subject Credit Value}_n}{\sum_{n=1}^{N} \text{Subject Credit Value}_n}$$

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 without any grade assigned
(v) Subjects from which a student has been allowed to withdraw (i.e. those with the grade 'W')

Subject which has been given an “S” code, i.e. absent from all assessment components, 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 ranges from 0.00 to 4.30 from 2020/21.

13.2 For the purpose of determining the award classification, any subjects passed after the graduation requirement has been met or subjects taken on top of the prescribed credit requirements for award shall not be taken into account in the grade point calculation for award classification (i.e award GPA). However, if a student attempts more elective subjects (or optional subjects) than those required for graduation in or before the semester in which he becomes eligible for award, the elective subjects (or optional subjects) with a higher grade/contribution shall be included in the grade point calculation (i.e. the excessive subjects attempted with a lower grade/contribution, including failed subjects, will be excluded).

13.3 Subjects offered within the programme contribute equally to the calculation of the GPA and award GPA. The table below shows different types of GPA and their calculation methods:

Types of GPA	Purpose	Rules for GPA calculation
GPA	Determine progression/ graduation	(1) All academic subjects taken by the student throughout his/her study, both inside and outside the programme curriculum, are included in the GPA calculation. (2) For retake subjects, only the last attempt will be taken in the GPA calculation. (3) Level weighting, if any, will be ignored.
Semester GPA	Determine progression	Similar to the rules for GPA as described above, except that only subjects taken in that Semester, including retaken subjects, will be included in the calculation.
Award GPA	For determination of award classification	(1) If the student has not taken more subjects than required, the Award GPA will be as follows: For programmes without level weighting: Award GPA = GPA (2) If the student has taken more subjects than required, refer to Section 13.2 above.

14. Guidelines for Award Classification

14.1 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.

The following GUIDELINES will be used by the Board of Examiners to recommend the classification of the award:

Guidelines

Distinction	The student's performance/attainment is outstanding, and identifies him as exceptionally able in the field covered by the programme in question.
Credit	The student has reached a standard of performance/ attainment which is more than satisfactory but less than outstanding.
Pass	The student has reached a standard of performance/attainment ranging from just adequate to satisfactory.

14.2 The following are the award GPA ranges for determining award classifications:

Award	***Award GPA***
Distinction	3.60 – 4.30
Credit	3.00 – 3.59
Pass	1.70 – 2.99

14.3 In awarding a distinction, the Board of Examiners would also take into consideration the amount of credit transfers earned by the student. To be considered for a distinction, the student should normally have no more than 40% of the credits earned by credit transfer [i.e. 4 taught subjects (12 credits) for MSc; 2 (6 credits) for PgD exit award)].

14.4 Students who have committed academic dishonesty or non-compliance with examination regulations will be subject to the penalty of the lowering of award classification by one level. The minimum of downgraded overall result will be kept at a Pass. In rare circumstances where both the Student Discipline Committee and Board of Examiners consider that there are strong justifications showing the offence be less serious, the requirement for lowering the award classification can be waived.

14.5 Decisions by the Boards of Examiners on award classifications to be granted to each student on completion of the programme shall be ratified by the Faculty Board. For cases the decisions of which do not conform to the above indicative GPA range, they should be referred, by the Faculty Board, to the Academic Planning and Regulations Committee for ratification.

15. 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.

16. Recording of Disciplinary Actions in Students' Records

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

16.2 Students who are found guilty of academic dishonesty or non-compliance with examination regulations 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 / noncompliance with examination regulations'. 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.

16.3 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.

16.4 The University reserves the right to withhold the issuance of any certification of study to a student/graduand who has unsettled matters with the University, or is subject to disciplinary action.

- END -

Operational Guidelines on Dissertation

With the exception of the stipulations in Section 8 of the Regulations which must be compiled with, this Annex serves as a guideline to students and staff.

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1. INTRODUCTION

The dissertation is a very significant component of a Master's programme. It carries a weight equivalent to three taught subjects and represents around 315 – 345 hours of student effort. Since students usually continue with their jobs while they work on their dissertations, the subject of the dissertation is preferably related to the student's employment.

The dissertation should be an exposition of a student's own work and ideas. Where others have had an input (e.g. in a team situation) this should be clearly identified. Plagiarism is unacceptable. Expulsion may be imposed in cases of proven plagiarism (See *Annex-Pages 19 to 21*).

Though the subject areas of dissertations are so diverse it is impossible to define a standard approach to carry out the dissertation, its content should include an introduction and definition of objectives, a literature survey, a review of the problem followed by a description of the student's approach to solving the problem, the results or findings, an intellectual analysis of the results or findings, and finally a logical review of the conclusions drawn.

Students are encouraged to initiate dissertation topics relating to their employment. However, students may take up campus based dissertations in cases of difficulty.

2. THE DISSERTATION PROCESS: PREPARATION, PROGRESS AND ASSESSMENT

The procedures for preparing a dissertation can be divided into three different stages.

2.1 Proposal

2.1.1 Each department hosting an award may arrange an Award Dissertation Seminar in the first week of each semester. At this time the Chairman of Departmental Postgraduate Programme Committee will circulate a list of staff research interests and possible topics to students. Academic supervisors, and professional supervisors (optional) are assigned by the Departmental Postgraduate Programme Committee. Only students who have registered on the dissertation subject will be assigned supervisors and permitted to submit proposals.

2.1.2 The purpose of these Dissertation Seminars is to enable participants to identify and define a problem for valid research, to develop their abilities to identify

and evaluate appropriate research methods, and to provide a framework from which participants can begin their own research work. The content of some of the seminars will include research methods, research design, analysis of data, presentation of findings, and ethical and legal considerations. Staff members active in research will participate and interact with students in answering questions and leading discussion on major issues.

2.1.3 Subsequent to the Dissertation Seminar, the student will prepare a dissertation proposal in a standard format using a synopsis form (Form AAE-PSE125 attached) in consultation with his academic supervisor. This standard form can be downloaded from the web.

2.1.4 Students are expected to submit their dissertation proposal to the Departmental Postgraduate Programme Committee for approval no later than the last teaching day of the semester in which the student first registers for dissertation.

2.1.5 Regulations concerning dissertation registration

2.1.5.1 Once a dissertation proposal is approved the student shall proceed at once to carry out the work.

2.1.5.2 Students should be aware that approval to commence a dissertation is by no means automatic. There will be cases where a student is not permitted to proceed with a dissertation and therefore such students will be required to leave the programme on completion of the requirements for a Postgraduate Diploma award.

2.1.5.3 Students can register on dissertations only if they are co-taking and/or have taken a total of 3 taught subjects (including credit transferred subjects) in that semester. The normal period for completion of a dissertation is 3 semesters. Students are required to pay for all of the 9 credits the dissertation carries in the first semester when he enrols on the dissertation. Fees paid will not be refunded even if the student withdraws from his dissertation or from the Scheme during the course of his registration. The registration period for the dissertation is set at a maximum of 4 semesters from the date of registration, subject to the regulations on the normal duration for completion of a programme and subject to satisfactory reports on progress from the academic supervisor. The minimum period for the dissertation work to be completed is 2 semesters. Break of study is normally not permitted once a student registers for dissertation and students are expected to pursue their dissertation in consecutive semesters.

2.1.5.4 Subject to satisfactory reports on progress from the academic supervisor, students whose dissertation proposal has been approved will continue to register on their dissertation until either the completion of their dissertation or the normal dissertation registration period expires.

2.1.5.5 The student should plan to submit the completed dissertation well before the final deadline and at least several months before the end of the normal period.

2.2 Progress Reports

2.2.1 Students are expected to submit a progress report (Form AAE-PSE126 attached) to the Departmental Postgraduate Programme Committee via their academic supervisor at least once every semester to ensure smooth progress of the dissertation.

2.2.2 Students should inform their academic supervisors immediately when difficulties arise.

2.3 Early Warning

Upon request from the Departmental Postgraduate Programme Committee, a student who fails to progress to his academic supervisor's satisfaction will receive a warning letter from the department hosting the award.

2.4 Submission of Dissertation before Assessment

2.4.1 Under normal circumstances, with the agreement of the supervisor(s), students may prepare for assessment after satisfactory progress.

2.4.2 Students should submit the dissertation together with a Dissertation Submission Form (Form AAE-PSE127 attached) to the academic supervisor one month prior to the end of the semester.

2.5 Assessment

2.5.1 Oral examination

After submission of the dissertation for assessment, the academic supervisor shall make arrangements with the assistance of the department on a mutually convenient time and place for an oral exam at which the other assessors will be present.

2.5.2 Assessment panel

The assessment panel will consist of two categories of member, namely:

2.5.2.1 the supervisors (academic supervisor, and professional supervisor if relevant); and

2.5.2.2 a second assessor who is a subject expert from the department, from another department in the University, or from industry, to be appointed by the Departmental Postgraduate Programme Committee.

2.5.3 Regulations concerning dissertation assessment

2.5.3.1 The date set for the oral examination shall allow sufficient time for the examiners to read the submission and should normally be no later than

one month after submission of the dissertation.

2.5.3.2 After conducting the oral examination, the assessment panel will jointly allocate a grade guided by the following weightings which may vary depending on the nature of the project. Individual awards may modify key items and the recommended weightings according to the needs of each award.

Progress 20%	Report 50%	Oral 30%	Total 100%

2.5.3.3 After the assessment of the dissertation is complete the academic supervisor shall write a report on the outcome using a standard outline report form. This report must be signed by all who participated in the assessment of the dissertation and be forwarded to the Departmental Postgraduate Programme Committee.

2.5.3.4 The report shall contain a date by which the student should submit his final dissertation and the number of hard and electronic copy required to the host Department which would arrange to send an electronic copy to the Library. The deadline for submission of the report of the assessment panel to the Departmental Postgraduate Programme Committee is TWO WEEKS before the meeting of the Subject Assessment Review Panel.

2.5.3.5 Departments could at their discretion allow students to complete their dissertations during the summer break. In such cases these results could be processed by the Subject Assessment Review Panel held for the summer semester to allow students to graduate.

2.5.3.6 Applications to defer submission should NOT normally be considered or approved except under exceptional circumstances such as illness. In such cases, students' applications for deferment of study can be considered.

2.5.3.7 If a student wishes to delay the submission of the completed dissertation beyond the normal period but within the maximum period of 4 semesters, he may apply on the advice of the supervisor. The application must be approved by the Departmental Postgraduate Programme Committee.

2.5.3.8 When permission is granted to extend the dissertation registration beyond the normal period, the student shall be required to pay a fee which is set out in the Student Handbook, which shall entitle him to register for one additional semester.

3. DISSERTATION SUPERVISION

The amount of effort required by students in the dissertation should clearly be reflected in the quantity and quality of the final submission. In assessing the standard of dissertations supervisors will be seeking to ensure that the student has met with the aims of this part of the programme.

3.1 Academic Supervisor

3.1.1 The student and academic supervisor should contact each other from time to time to discuss progress against his agreed programme. The responsibility for arranging meetings between student and academic supervisor is shared by both parties.

3.1.2 The academic supervisor will provide guidance to complement that available within the student's employing organisation and advises the student about the style of presentation of the dissertation. If a professional supervisor has been appointed, the academic and professional supervisors will liaise as circumstances require. The academic supervisor will be available for consultation on a regular basis both at the University and at the student's workplace according to circumstances.

3.2 Professional Supervisor (optional)

3.2.1 The role of the professional supervisor is to be able to assess the student's effort in the workplace and assist in the conduct of the oral examination and provide assurance that the candidate's work has been independently done. Students should approach a prospective professional supervisor and explain their requirements and should obtain his agreement to act as professional supervisor.

3.2.2 If the work for the dissertation forms part of a group endeavour within the student's organisation, it is essential that the student's personal contribution can be identified and that the professional supervisor can speak for the part which the student has played.

4. FORMAT AND PRESENTATION OF DISSERTATION

4.1 Each copy of a dissertation must be typewritten in double or one-and-a-half lines spacing on International-size-A4 paper, except for drawings, maps, or tables, for which there are no restrictions. The electronic copy should follow the same page set up and spacing specification.

4.2 A dissertation should contain the following parts, each starting on a new page, in the following order:

4.2.1 A cover page

DISSERTATION TITLE *(all capitalised)*

STUDENT NAME (*all capitalised)*

MSc in XXX

The Hong Kong Polytechnic University

Year of Award

4.2.2 A title page

The Hong Kong Polytechnic University

Name of Department

Dissertation Title

Student Name

A dissertation submitted in partial fulfillment of the requirements
for the MSc in xxx

the month and year of the initial
submission

4.2.3 A Certificate of Originality

CERTIFICATE OF ORIGINALITY

I hereby declare that this dissertation is my own work and that, to the best of my knowledge and belief, it reproduces no material previously published or written, nor material that has been accepted for the award of any other degree or diploma, except where due acknowledgement has been made in the text.

_____(Signed)

_____(Name of student)

4.2.4 Dedication (optional)

4.2.5 Abstract
- Consisting of a summary of the work done with 200-500 words.

4.2.6 Publications arising from the dissertation (optional)
- Follow the format described in Paragraph 4.5 below.

4.2.7 Acknowledgements

4.2.8 Table of contents

4.2.9 List of figures, tables and abbreviations (all optional)

4.2.10 Chapter 1 : Introduction (the subtitles for all chapters are to be decided by the students)

4.2.11 The dissertation body

4.2.12 Conclusions and Suggestions for Future Research (the latter being optional).

4.2.13 References
- The references for all chapters can be placed at the end, or those for each chapter can be placed at the end of the chapter.
- References should be presented in alphabetical order of the first author, using the reference citation format for academic journal papers, book chapters, conference papers, research reports/working papers and books/research monographs, or in an internationally accepted format used by the discipline in which the study lies.

4.3.1 Intellectual property created by students in the course of their study at the University shall be owned by the University only if the student receives financial support from the University in the form of wages, salary or stipends for undertaking their study or research in the University; makes material use of the University's resources for his/her research work; receives material guidance and intellectual input from the University's staff for his/her research work; or if his/her research work is funded by a

grant to the University or to him/her by virtue of his/her employment by the University.

4.3.2 Generally speaking, intellectual property rights, among other things, refers to novel information and ideas that the law protects. It means the material or communicable result of scientific, humanistic, literary, and artistic effort. It includes, but is not limited to, works in the forms of copyrights, designs, inventions, discoveries, trademarks, formulae, processes, computer software, drawings and sculptures, journal articles, and conference presentations. Students should not, therefore, make the claim that they own the intellectual property of the research work in their dissertation or in other publications that resulted from their research work.

4.4 Each copy of the dissertation submitted for examination purpose should include the words 'Initial Submission for Examination Purpose' lettered on the front cover.

4.5 The approved dissertation should be submitted in electronic format and must be prepared in accordance with the following requirements:

File format	PDF format Compatible with PDF version 1.4 (Acrobat 5) or higher Must be text-searchable Image PDF is not acceptable
Paper size	A4 (210 x 297 mm), except for drawings, maps or tables
Security	No password assigned and all security settings should be turned off
Font	All fonts must be embedded
Spacing	Must be double or one-and-a-half lines

.

The electronic version must be clear enough that it presents all images, data and symbols.

5. BINDING OF DISSERTATIONS

[This is optional. Students should consult your department on the requirement.]

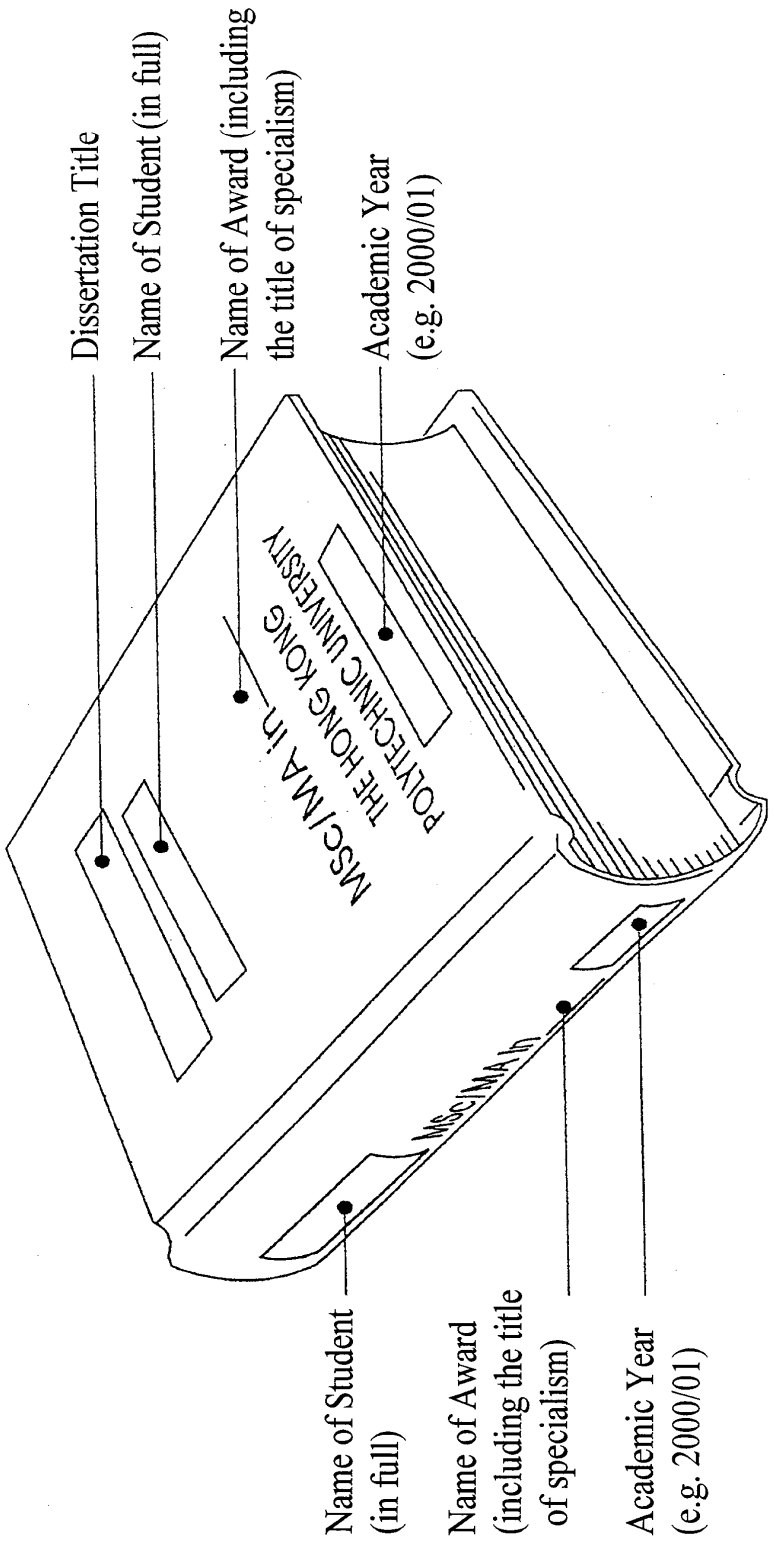
5.1 After assessment students will have their dissertations bound by outside binderies at their own expense. A rough sketch of a bound dissertation is set out on next page.

5.2 All dissertations should be bound with hard covers, with silver blocking on the front cover and on the spine. The colour should be navy blue.

5.2.1 Of the final copies submitted, one of these may be in a temporary heat-sealed "Perfect" binding with the title, name of author, degree and date. One of the final copies will be bound and will be lodged with the host department.

5.2.2 These final copies of the dissertation shall be checked and approved by the academic supervisor or Dissertation Coordinator. This shall be done within one month of the dissertation oral examination.

Rough Sketch of a Bound Dissertation



THE HONG KONG
POLYTECHNIC UNIVERSITY
香港理工大學

Form AAE-PSE125

Dissertation Proposal for MSc in _____

This form should be typewritten. All sections should be completed in full. Sections 1-3 are to be completed by the student. In signing this form the Departmental Postgraduate Programme Committee confirms that the student is registered on dissertation, the proposal is of an acceptable academic standard and that the university resources necessary for the dissertation will be made available. The completed form should be sent to the Departmental Postgraduate Programme Committee for approval no later than the last day of a semester.

Section 1 : Student Details

Student's Name : Student No. :

Tel No. : Email address. :

Subjects taken so far (include title, grade, and academic year for all subjects for which a grade has been obtained)

Section 2 : Supervisor Details

Academic Supervisor's Name, Qualifications and Department :

Professional Supervisor's Name, Qualifications, Position, and Affiliation (appointment of which is optional) :

Professional Supervisor's Address :

Tel. No. : Email address. :

Section 3 : Details of Dissertation Topic

Dissertation title :

Signature of student : Date :

Section 4 : Comments of Academic Supervisor

Signature : Date :

Section 5 : Comments of Professional Supervisor, if any

Signature : Date :

Section 6 : Decision of Award Committee

Approved/Referred back for improvement/Rejected

Signature : Date :
Chairman, Departmental Postgraduate Programme Committee

Objectives of the Project

Content

(Innovative features, challenge, academic value and applicability of the project)

(Cont'd)

Methodology

References

Scheduled programme of work

Description of facilities required and justification

(Also detail any other supporting facilities obtained elsewhere)

Expected completion date :

_____

Student's Signature

Dissertation Progress Report

This report is to be completed by the student then endorsed by the academic supervisor who will forward it to the Departmental Postgraduate Programme Committee every semester.

Section 1 : To be Completed by Student

Student's Name :_____ Student no. _____

MSc in

_____

Academic Supervisor's Name :

_____

Dissertation Title :

_____

Start Date : _____ Expected Completion Date : _____

Student's report

Briefly describe progress since last report (or since commencement):

Please explain any problems you have identified and suggest appropriate action :

Signed : _____ Date : _____

Section 2 : To be Completed by Academic Supervisor

Academic Supervisor's comments

Progress is generally satisfactory / unsatisfactory*

Comments :

Signed : _____ Date : _____

Dissertation Submission Form

Section 1 : To be completed by student

Students' Name : Student No.:

MSc in :

Proposed Dissertation Title :

Name and department/company of academic, and professional supervisor (if any):

Signature : Date :

Section 2 : To be completed by Academic Supervisor

Please tick as appropriate:

- ☐ I agree that the dissertation is ready for submission.
- ☐ I do not agree that the dissertation is ready for submission. My specific views on the shortcomings have been made known to the student.
- ☐ I am satisfied with the title proposed by the student.
- ☐ I have amended the title proposed by the student as shown above.

Signature : Date :

Section 3 : To be completed by Chairman of Departmental Postgraduate Programme Committee

The Award Committee has nominated _____

as the assessor for this dissertation (optional if a professional supervisor is present).

Signature : Date :

About Plagiarism

Students should refer to Appendix 3 of the Student Handbook for details
https://www.polyu.edu.hk/ar/docdrive/polyu-students/student-handbook/Student_Handbook_202324_English.pdf

Plagiarism refers to the act of using the creative works of others (e.g. ideas, words, images or sound, etc) in one's own work without proper acknowledgement of the source. According to the Webster's Ninth New Collegiate Dictionary (1987), to 'plagiarise' means

> [T]o steal and pass off (the ideas or words of another) as one's own : [to] use (a created production) without crediting the source : [to] commit literary theft : [to] present as new and original an idea or product derived from an existing source.

The University views plagiarism, whether committed intentionally or because of ignorance or negligence, as a serious disciplinary offence. Excuses such as "not knowing that this is required" or "not knowing how to do it" will not be accepted. It is the student's responsibility to understand what plagiarism is, and take action steps to avoid plagiarism in their academic work. The golden rule is: "if in doubt, acknowledge".

Avoiding Plagiarism

Students are required to submit their original work and avoid any possible suggestion of plagiarism in the work they submit for grading or credit. Below are some suggestions on how you can avoid plagiarism in your own work:

Use sources with care and respect

- Take careful notes so that you know where you got your information.
- Keep track of all the sources you have used for each assignment.
- Cite all your sources in your finished work, distinguishing carefully between your own ideas/work and those taken from others.
- Include all your sources in your Reference or Bibliography section, normally included at the end of the paper.

Find out the expectations of your Department and your teacher

- Different disciplines or professions may have slightly different conventions for citation and referencing. Ask your Department or teacher for the specific citing and reference system or conventions used in your chosen profession/discipline.
- Ask your teacher what types of collaborations and help is permitted for the specific assignment.

Develop your academic skills

- Plan your academic work carefully and start early so that you have time to do your own work.
- Make a work schedule for your work and try to keep to it.

- Study resource materials and attend courses or workshops provided by the University to continually improve your skills in referencing and academic writing.

Be honest, and always do your own work

- Do not attempt to disguise copying from sources, for example, by translating from sources in another language or changing some words of a copied text. Proper referencing is required.

- Do not quote, summarise or paraphrase from sources that you do not fully understand. Always be able to explain what the source means and why it is relevant.

Resources and Support Provided to Students

To know more about plagiarism and how to cite sources properly in your work, please refer to the booklet "About Plagiarism and How to Avoid It" developed by the University at https://www.polyu.edu.hk/ous/docdrive/Academic_Integrity/Plagiarism_Booklet.pdf.

You can also obtain more information about using sources and referencing styles from the following web page of the Centre for Independent Language Learning, English Language Centre of this University at https://elc.polyu.edu.hk/CILL/reference.aspx.

The University Library subscribes to EndNote. It is a reference management tool that could be used to help you create your own bibliographic database. More details can be found at: https://libguides.lb.polyu.edu.hk/ref-mgt-tools/endnote

The University's Policy on promoting academic integrity'

1. Academic integrity is the foundation of any academic endeavour of a university, and is valued highly at PolyU. It is therefore the responsibilities of all members of the University, including both staff and students, to ensure that they pursue their scholarly work in an academically honest manner.

2. The purpose of this policy on promoting academic integrity is to nurture among students responsible and ethical attitudes towards their academic work. More specifically, it attempts to:

    - Educate students about the importance of originality, honest, integrity and personal responsibility in academic pursuits and scholarly work;

    - Provide guidelines and tools for academic staff to detect cases of suspected plagiarism, and take necessary actions;

    - Provide opportunities for students to develop their ability to produce work that is plagiarism-free.

4. All academic staff are expected to actively monitor students' work for incidents of suspected plagiarism, using methods – including electronic detection – that are most suited for the context. They can, wherever they deem appropriate, require students to send any text-based assignments for electronic plagiarism check when/before submitting them for assessment.

5. Students of taught postgraduate and research postgraduate programmes must send their theses or dissertations for electronic plagiarism check, and revise the work if necessary, before submitting the work formally for examination. The respective Chief Supervisors are responsible for making sure that their students have complied with this requirement before sending their theses/dissertations to the Internal and/or External Examiners, and advising their students on how to revise their work to conform to the academic conventions of their discipline/profession.

6. All publications (e.g. conference paper or journal articles) produced by students and research personnel bearing the name of PolyU must also be sent for electronic plagiarism check, and subsequently revised if necessary, before submission to the relevant bodies (e.g. conference organisers or journal editors) for review for publication. Where appropriate, the overseeing academic staff are responsible for ensuring compliance of students/research personnel with this requirement.