Subject Description Form

Subject Code	AAE4004
Subject Title	Airworthiness and Regulations
Credit Value	3
Level	4
Pre-requisite/ Co-requisite/ Exclusion	Nil
Objectives	This subject aims at providing students with the fundamental concepts and principles of airworthiness; and the associated regulations from an international perspective in aircraft design, production, operation and maintenance. As airworthiness has to be considered as a coherent process from the design of aircraft to the monitoring of its technical condition in airline service, this subject covers topics on both initial airworthiness and continuing airworthiness. In addition, the economical, ethical and sustainability challenges of contemporary airworthiness issues will also be introduced. Based on the ICAO framework, this subject covers the airworthiness related regulations and requirements of European Union, the U.S.A. and Hong Kong. As such, the students understand the relationship and legal obligations pertaining to the stakeholders of the airworthiness processes.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a. Demonstrate an understanding and knowledge of the essential facts, concepts and principles associated with airworthiness and the underpinning regulations and requirements for initial and continuing airworthiness); and b. Demonstrate a knowledge of the contemporary airworthiness issues; and understanding of the economical, ethical and sustainability challenges facing initial and continuing airworthiness; and c. Function professionally in multidisciplinary teams.
Subject Synopsis/ Indicative Syllabus	**General** – Contemporary Global Safety Level; Commercial Air Transport; Evolution of Airworthiness Standards; Initial Airworthiness; Continuing Airworthiness; and Airworthiness vs Flight Safety. **Air Legislation** – ICAO; Chicago Convention; Annexes 1, 6, 7, 8, 16 and 19; EASA Regulation Structure; FAA Regulation Structure; Hong Kong Air Legislation System; Civil Aviation Ordinance (CAP448) and Air Navigation (Hong Kong) Order 1995 (CAP448C) **Aircraft Documentation, Certification and Requirements-** Initial Airworthiness; EASA; EASA Part-21, CS-23, 25,27 and 29; Type Design; Type-Certificates; Type-Certificate Data Sheets; Supplemental Type-Certificates; System Safety Assessment; type certificate validation and CS-25 vs FAR Part 25. Weight schedule; External and internal markings and signs, Certificate of Airworthiness Categories, purposes of flight; Certificate of Registration; Noise Certificate; Schedule 5 requirements for equipment; Radio station license, Change of ownership, Maintenance checks and inspections, Maintenance records; Maintenance documentation. Continuing Airworthiness; Service Bulletins, manufacturers service information; Modifications and repairs; Test flights; EDTO: maintenance and dispatch requirements; CAD 359 Low Visibility Operations (LVO); Reduced Vertical Separation Minima (RVSM) requirements.

	Operator Responsibilities –AN(HK)O 1995 Article 6; CAD 360; Maintenance Support Arrangement; Contracting-out Maintenance; Master Minimum Equipment List; Minimum Equipment List; Configuration Deviation List. **Continuing Airworthiness Management-**AN(HK)O 1995 Article 9; HKAR-181; HKAR 1.3-4 Renewal of Certificate of Airworthiness; Certificate of Maintenance Review; Renewal; Maintenance Programme; Reliability Programme; and Airworthiness Directives; Defect Reporting, Logbooks for Aircraft, Engine and Variable Propeller and Technical Logs, Maintenance Records.**Approvals-**AN(HK)O Article 11; HKAR-21; HKAR-145;–Safety & Quality System; Maintenance Organisation Exposition; Line Maintenance; Base Maintenance; Component Maintenance; Specialised Services; Certifying Staff, Support Staff, Human Factors in Maintenance; Occurrence Reporting; Certificate of Return to Service; HKAR-181 and HKAR-183. **Supply Chain and Inventory Management -** Stock control and inventory management, Classes of aviation materials and determination of the inventory level for each class using different techniques, Importance of effective inventory management, and the related supply chain, on cost optimisation. Acceptance of Aircraft Components: AN17 and Appendix 1, Impact of technical spares on Continuing Airworthiness. **Aircraft Maintenance Schedule –** how the Type Certificate holder develops the initial maintenance programme, using the reliability centred maintenance (RCM) or maintenance steering group 3 (MSG-3) methodology, for the operator to maintain the continuing airworthiness of its fleet in a cost- effective manner. The processes to obtain the approval of the maintenance programme from the State of Registry based on CAD 452 and CAD 418; Estimation of maintenance manhours for non-routine tasks. **Licensing of Maintenance Personnel** –HKAR-66; HKAR-147; Hong Kong Airworthiness Notices; Licence Categories; Licence Privileges; Maintenance Training Organisation Exposition; Approved Basic Training Course; and Aircraft Type/Task Training; Joint Maintenance Management (JMM); Technical Arrangement on Aviation Maintenance with Foreign Regulatory Authorities
Teaching/Learning Methodology	Lectures are used to deliver the knowledge of airworthiness topics to the students. Case study will be used to foster students' understanding of the subject matters. Industrial experts will be invited to share their experience and provide case studies to the students.

Assessment Methods in Alignment with Intended Learning Outcomes

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed		
		a	b	c
1. Examination	50%	✓		✓
2. Assignment	20%	✓		
3. Reports and presentation (Case Study)	30%		✓	
Total	100 %			

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

Overall Assessment:

0.6 x End of Subject Examination + 0.4 x Continuous Assessment

Examination is adopted to assess students' understanding on aircraft regulations, maintenance process and procedure and basic airworthiness related information. Site visits are used to provide the students real insight on aircraft maintenance process and opportunities to communicate with aviation professionals in the field. Case study report provides the students self-study opportunity to study and analyze different cases of aircraft problems related to airworthiness.

Student Study Effort Expected

Class contact:	
▪ Lecture	36 Hrs.
▪ Other student study effort:	
▪ Week 7 reading week	3 Hrs
▪ Assignments	20 Hrs.
▪ Report	60 Hrs.
Total student study effort	**119 Hrs.**

Reading List and References

1. De Florio, Filippo, Airworthiness: An Introduction to Aircraft Certification and Operations, Third edition. Butterworth-Heinemann is an imprint of Elsevier, 2016.
2. Kritzinger, Duane, Aircraft System Safety: Assessments for Initial Airworthiness Certification. Woodhead Publishing is an imprint of Elsevier, 2017.
3. Cusick, Stephen, Commercial Aviation Safety, Sixth edition. McGraw Hill Professional, 2017.
4. Kinnison, Harry, Aviation Maintenance Management, Second edition. McGraw Hill Professional, 2012.
5. Friend, C. H., Aircraft Maintenance Management. Longman Aviation

	Technology, 1992. 6. Fielder, John, The DC-10 Case: A Study in Applied Ethics, Technology, and Society. State University of New York State, 1992.

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