

Subject Description Form

Subject Code	AAE4004
Subject Title	Airworthiness and Regulations
Credit Value	3
Level	4
Pre-requisite/ Co-requisite/ Exclusion	Nil
Objectives	<p>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.</p>
Intended Learning Outcomes	<p>Upon completion of the subject, students will be able to:</p> <ol style="list-style-type: none"> a. Demonstrate an understanding and knowledge of the essential facts, concepts and principles associated with airworthiness and the underpinning regulations and requirements (including that of the ICAO, European Union, U.S.A., and Hong Kong 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	<p>General – Contemporary Global Safety Level; Commercial Air Transport; Evolution of Airworthiness Standards, Lessons Learned from Civil Aviation Accidents; Initial Airworthiness; Continuing Airworthiness; and Airworthiness vs Flight Safety.</p> <p>Air Legislation – ICAO; Chicago Convention; Annexes 1, 6, 7, 8, 16 and 19; State of Design, State of Manufacture, State of Registry and State of the Operator; Hard Law; Soft Law; EASA Regulation Structure; FAA Regulation Structure; Hong Kong Air Legislation System; and Trade & Professional Associations.</p> <p>Type Certification – Initial Airworthiness; FAA; FAR Parts 21, 23, 25, 27, 29, 33, 34, 35 & 36; JAA; JAR; EASA; EASA Part-21, AMC-20, CS-23, CS-25, CS-27, CS-29, CS-36, CS-E, CS-P; Type Design; Type-Certificates; Type-Certificate Data Sheets; Type-Certificate Data Sheets for Noise; Type Certification Process; Certification Programme; Type Certification Basis; Compliance Demonstration; Means of Compliance; Compliance Verification; Changes to Type-Certificates; Supplemental Type-Certificates; System Safety Assessment; and CS-25 vs FAR Part 25.</p> <p>Part-21 Approvals – EASA Part-21 vs FAR Part 21; FAR Part 183 Organization Designation Authorization; EASA Part-21 Subpart J Design Organisation Approval; EASA Part-21 Subpart D Changes to Type-Certificates; Classification of Changes to a Type-Certificate; Changed Product Rule 21.A.101; EASA Part-21</p>

	<p>Subpart E Supplemental Type-Certificate ; EASA Part-21 Subpart G Production Organisation Approval; EASA Form 52; EASA Form 1; and EASA Part-21 Subpart O European Technical Standard Order; and HKAR-21.</p> <p>Certificate of Airworthiness – Export Airworthiness Approval; Export Certificate of Airworthiness; FAA Form 8130-3, Type-Certificate Validation; AN(HK)O 1995 Article 8; HKAR-21 Subpart H; HKAR-1 Sections 1.1 & 1.3; Hong Kong Airworthiness Notices; HKAR-183; CAD Design Requirements; Circumstances of Flight; Aircraft Report; Categories of Aircraft; Types of Aircraft; Approved Flight Test Schedule; and CAD Form 183-3.</p> <p>Operator Responsibilities – ICAO Annex 6; Airworthiness Aspects of Air Operator Certificate; European Union Regulation for Air Operations; U.S.A. Air Carrier Certification; AN(HK)O 1995 Article 6; CAD 360; CAD361; Maintenance Support Arrangement; Contracting-out Maintenance; Maintenance Management Exposition; Airworthiness Aspects of Operational Approvals; Master Minimum Equipment List; Minimum Equipment List; Configuration Deviation List.</p> <p>Continuing Airworthiness Management – EASA Part-M; Continuing Airworthiness; Continuing Airworthiness Tasks; EASA Part-M Subpart G Continuing Airworthiness Management Organisation; EASA Airworthiness Review Certificate; 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.</p> <p>Maintenance Organisation Approval – ICAO Annex 8, EASA Part-145, FAR Part 145, FAR Part 43; AN(HK)O Article 11; 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; CAD Form One; FASA Form 1, FAA Form 337, and FAA Form 8130-3.</p> <p>Licensing of Maintenance Personnel – ICAO Annex 1; EASA Part-66; EASA Part-147; FAR Part 65; FAR Part 147; HKAR-66; HKAR-147; Hong Kong Airworthiness Notices; Licence Categories; Licence Privileges; Complex Maintenance Tasks; Maintenance Training Organisation Exposition; Approved Basic Training Course; and Aircraft Type/Task Training.</p>
<p>Teaching/Learning Methodology</p>	<p>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.</p>

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	60%	✓		✓
	2. Assignment	20%	✓		
	3. Reports and presentation (Case Study)	20%		✓	
Total	100 %				
<p>Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:</p> <p>Overall Assessment: 0.6 x End of Subject Examination + 0.4 Continuous Assessment</p> <p>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.</p>					
Student Study Effort Expected	Class contact:				
	▪ Lecture		39 Hrs.		
	Other student study effort:				
	▪ Assignments		20 Hrs.		
	▪ Report		60 Hrs.		
	Total student study effort		119 Hrs.		
Reading List and References	<ol style="list-style-type: none"> De Florio, Filippo, <i>Airworthiness: An Introduction to Aircraft Certification and Operations</i>, Third edition. Butterworth-Heinemann is an imprint of Elsevier, 2016. Kritzinger, Duane, <i>Aircraft System Safety: Assessments for Initial Airworthiness Certification</i>. Woodhead Publishing is an imprint of Elsevier, 2017. Cusick, Stephen, <i>Commercial Aviation Safety</i>, Sixth edition. McGraw Hill Professional, 2017. Kinnison, Harry, <i>Aviation Maintenance Management</i>, Second edition. McGraw Hill Professional, 2012. Friend, C. H., <i>Aircraft Maintenance Management</i>. Longman Aviation Technology, 1992. Fielder, John, <i>The DC-10 Case: A Study in Applied Ethics, Technology, and Society</i>. State University of New York State, 1992. 				