

Subject Description Form

Subject Code	AAE3006
Subject Title	Safety, Reliability and Compliance
Credit Value	3
Level	3
Pre-requisite/ Co-requisite/ Exclusion	Nil
Objectives	<p>This subject will provide students to</p> <ol style="list-style-type: none"> 1. Gain fundamental knowledge of aviation safety and compliance; and 2. Develop students' understanding of methods and techniques used in evaluating the safety, reliability and compliance of aviation operations and services.
Intended Learning Outcomes	<p>Upon completion of the subject, students will be able to:</p> <ol style="list-style-type: none"> a. Work professionally in aviation systems and understand aircraft regulations (including the understanding of the safety, quality and reliability provisions and infrastructure in aviation administration and service providers and the mathematical concepts used in reliability and safety analysis of aviation); b. Function professionally in multidisciplinary teams (including the assessment processes for compliance to certificates in aviation trade); and c. Understand professional and ethical responsibility (including the identification of major cases of aviation errors and violations).
Subject Synopsis/ Indicative Syllabus	<p>Introduction - Safety. Product and Service Quality. Reliability. Assurance. Compliance. Total Care: Airlines; airports, air traffic control, MRO, OEM and stakeholders.</p> <p>Aviation Errors and violations - Accident and incident investigation models; Maintenance error decision models; Root cause analysis.</p> <p>Certification and Compliance - Roles of aviation authorities and administrations. Important certificates and specifications in aviation industry. Documentation and Implementation. Auditing. Non-Compliance and Follow up.</p> <p>Reliability Concepts and applications - Failures. Failure rate. MTBF. Reliability distributions. Series and parallel redundancy. Imperfect maintenance. Reliability assessment. Failure prevention tools.</p> <p>Performance Measurement - Safety Management System. Hazard analysis and control. Performance indicators. Statistical control techniques. Safety Culture.</p>

<p>Teaching/Learning Methodology</p>	<p>Lectures are used to deliver the fundamental knowledge in relation to various aspects of aviation system safety and reliability (outcomes a to c).</p> <p>Tutorials are used to illustrate the application of fundamental knowledge to practical situations (outcomes a to c).</p> <p>Group mini-projects are used to help students to deepen their knowledge on a specific topic through search of information, analysis of data and report writing (outcomes a to c).</p> <p>Special seminar(s) delivered by invited industrial professionals may be used to relate the concepts learnt in class to engineering practices. Students are expected to achieve better understanding of aviation safety through this activity (outcomes a and c).</p> <table border="1" data-bbox="528 629 1474 1059"> <thead> <tr> <th rowspan="2">Teaching/Learning Methodology</th> <th colspan="3">Intended subject learning outcomes to be cover</th> </tr> <tr> <th>a</th> <th>b</th> <th>c</th> </tr> </thead> <tbody> <tr> <td>1. Lectures</td> <td>✓</td> <td>✓</td> <td>✓</td> </tr> <tr> <td>2. Tutorials</td> <td>✓</td> <td>✓</td> <td>✓</td> </tr> <tr> <td>3. Mini-project</td> <td>✓</td> <td>✓</td> <td>✓</td> </tr> <tr> <td>4. Special seminar</td> <td>✓</td> <td></td> <td>✓</td> </tr> </tbody> </table>	Teaching/Learning Methodology	Intended subject learning outcomes to be cover			a	b	c	1. Lectures	✓	✓	✓	2. Tutorials	✓	✓	✓	3. Mini-project	✓	✓	✓	4. Special seminar	✓		✓										
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Student Study Effort Expected	Class contact:	
	▪ Lecture	27 Hrs.
	▪ Tutorial	9 Hrs.
	Other student study effort:	
	▪ Reading week	3 Hrs.
	▪ Course work	25 Hrs.
	▪ Self-study	46 Hrs.
	Total student study effort	110 Hrs.
Reading List and References	<ol style="list-style-type: none"> 1. Redrigues, C.C. and Cusick, S.K., Commercial Aviation Safety, McGraw Hill, latest edition. 2. Ferguson, M. and Nelson, S., Aviation Safety: a balanced industry approach, Delmar Cengage Learning, latest edition. 3. Reason, J. and Hobbs, A., Managing Maintenance Error, Ashgate, latest edition. 4. O'Connor, P.D.T., Practical Reliability Engineering, Wiley, latest edition. 5. International Journal of Reliability, Quality and Safety Engineering. 	

May 2025