

Subject Description Form

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| 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); and 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> |
| Teaching/Learning Methodology | Lectures are used to deliver the fundamental knowledge in relation to various aspects of aviation system safety and reliability (outcomes a to d). |

| | <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="470 593 1433 1019"> <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 | ✓ | | ✓ | | | | | | | | | | |
|---|--|-----------------------------------|--|---|--|---|---|---|-------------|----------------|-----|---|--------------|---|-----------------------|-----|-----------------|---|---|----------|--------------------|---|---|---|-----------------|-----|---|---|---|-------|-------|--|--|--|
| Teaching/Learning Methodology | Intended subject learning outcomes to be cover | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | a | b | c | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Lectures | ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2. Tutorials | ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3. Mini-project | ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4. Special seminar | ✓ | | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>Assessment Methods in Alignment with Intended Learning Outcomes</p> | <table border="1" data-bbox="470 1093 1433 1601"> <thead> <tr> <th rowspan="2">Specific assessment methods/tasks</th> <th rowspan="2">% weighting</th> <th colspan="3">Intended subject learning outcomes to be assessed</th> </tr> <tr> <th>a</th> <th>b</th> <th>c</th> </tr> </thead> <tbody> <tr> <td>1. Assignments</td> <td>15%</td> <td></td> <td>✓</td> <td>✓</td> </tr> <tr> <td>2. Group mini-project</td> <td>15%</td> <td>✓</td> <td>✓</td> <td>✓</td> </tr> <tr> <td>3. Tests</td> <td>15%</td> <td>✓</td> <td>✓</td> <td>✓</td> </tr> <tr> <td>4. Examinations</td> <td>55%</td> <td>✓</td> <td>✓</td> <td>✓</td> </tr> <tr> <td>Total</td> <td>100 %</td> <td colspan="3"></td> </tr> </tbody> </table> <p>Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:</p> <p>Overall Assessment:</p> <p>$0.6 \times \text{End of Subject Examination} + 0.4 \times \text{Continuous Assessment}$</p> <p>Examination is adopted to assess students on the overall understanding and the ability of applying the concepts. It is supplemented by seminars and continuous assessment including assignments, group mini-project, and tests. The continuous assessment is aimed at enhancing the students' comprehension and assimilation of various topics of the syllabus. In particular, group mini-project is used to assess the students' capacities of self-learning and problem-solving and effective</p> | Specific assessment methods/tasks | % weighting | Intended subject learning outcomes to be assessed | | | a | b | c | 1. Assignments | 15% | | ✓ | ✓ | 2. Group mini-project | 15% | ✓ | ✓ | ✓ | 3. Tests | 15% | ✓ | ✓ | ✓ | 4. Examinations | 55% | ✓ | ✓ | ✓ | Total | 100 % | | | |
| Specific assessment methods/tasks | % weighting | | | Intended subject learning outcomes to be assessed | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | a | b | c | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Assignments | 15% | | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2. Group mini-project | 15% | ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3. Tests | 15% | ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4. Examinations | 55% | ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Total | 100 % | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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| | communication skill in English so as to fulfill the requirements of working in the aviation industry. | |
| Student Study Effort Expected | Class contact: | |
| | ▪ Lecture | 30 Hrs. |
| | ▪ Tutorial | 9 Hrs. |
| | Other student study effort: | |
| | ▪ 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. | |

November 2020