

## Subject Description Form

<b>Subject Code</b>	AAE4015
<b>Subject Title</b>	Advanced Accident and Hazards Analysis with Big Data in Aviation
<b>Credit Value</b>	4
<b>Level</b>	3
<b>Pre-requisite/ Co-requisite/ Exclusion</b>	<b>Pre-requisite:</b> AAE4903 Human Factors in Aviation
<b>Objectives</b>	<p>This subject will provide students with</p> <ol style="list-style-type: none"> <li>1. An overview understanding of hazard recognition, accident prevention, and accident investigation;</li> <li>2. The fundamental knowledge and skills to conduct a general air traffic accident investigation; and</li> <li>3. Up-to-date case studies together with practical methods for accident analysis in aviation.</li> </ol>
<b>Intended Learning Outcomes</b>	<p>Upon completion of the subject, students will be able to:</p> <ol style="list-style-type: none"> <li>a. Describe the progress of an effective accident investigation;</li> <li>b. Analyze the contributing factors to accidents via advanced big data analytics techniques;</li> <li>c. Evaluate the different causal factors that contribute to accidents and their potential effects; and</li> <li>d. Design appropriate interventions/ recommendation to improve aviation safety.</li> </ol>
<b>Subject Synopsis/ Indicative Syllabus</b>	<p><b>Accident response and management</b> – Aviation safety culture; Accident notification processes; Health and safety at the accident site; Aviation accident pathology.</p> <p><b>Accident investigation</b> – Systematic approach to investigation; Collection of evidence; Data recorder and their analysis; Aviation accident photography; Hazards management on site; Investigative interview techniques.</p> <p><b>Accident analysis</b> – Human factors in accidents; Fundamental analysis and advanced analytical approaches, such as machine learning and data mining; Developing safety recommendation.</p> <p><b>Hazard analysis</b> – Hazard analysis methods; Effects of hazard. Hazard control.</p>

<p><b>Teaching/Learning Methodology</b></p>	<p>Teaching is conducted through class lectures. The basic knowledge, analytic methods, and theoretical frameworks will be introduced. The understanding of how to address and formulate problems by using classical accident analysis methods, data mining techniques, public accident reports is emphasized. Case studies and analysis are taught in class as well as the related real-life scenarios using data to enhance their research abilities. Assignment, mid-term examination and final examination are used to make up the course work marks.</p>							
	<p>Teaching/Learning Methodology</p>				<p>Intended subject learning outcomes to be covered</p>			
	<p>1. Lecture</p>	<p>✓</p>	<p>✓</p>	<p>✓</p>	<p>✓</p>			
	<p>2. Case Study</p>	<p>✓</p>	<p>✓</p>	<p>✓</p>	<p>✓</p>			

  

<p><b>Assessment Methods in Alignment with Intended Learning Outcomes</b></p>	<table border="1"> <thead> <tr> <th data-bbox="486 842 805 1010" rowspan="2">Specific assessment methods/tasks</th> <th data-bbox="813 842 965 1010" rowspan="2">% weighting</th> <th colspan="4" data-bbox="973 842 1436 943">Intended subject learning outcomes to be assessed</th> </tr> <tr> <th data-bbox="973 949 1077 1010">a</th> <th data-bbox="1085 949 1189 1010">b</th> <th data-bbox="1197 949 1300 1010">c</th> <th data-bbox="1308 949 1436 1010">d</th> </tr> </thead> <tbody> <tr> <td data-bbox="486 1016 805 1084"> <p>1. Assignment</p> </td> <td data-bbox="813 1016 965 1084"> <p>20%</p> </td> <td data-bbox="973 1016 1077 1084"></td> <td data-bbox="1085 1016 1189 1084"> <p>✓</p> </td> <td data-bbox="1197 1016 1300 1084"> <p>✓</p> </td> <td data-bbox="1308 1016 1436 1084"> <p>✓</p> </td> </tr> <tr> <td data-bbox="486 1090 805 1158"> <p>2. Test</p> </td> <td data-bbox="813 1090 965 1158"> <p>30%</p> </td> <td data-bbox="973 1090 1077 1158"> <p>✓</p> </td> <td data-bbox="1085 1090 1189 1158"> <p>✓</p> </td> <td data-bbox="1197 1090 1300 1158"> <p>✓</p> </td> <td data-bbox="1308 1090 1436 1158"></td> </tr> <tr> <td data-bbox="486 1164 805 1232"> <p>3. Final examination</p> </td> <td data-bbox="813 1164 965 1232"> <p>50%</p> </td> <td data-bbox="973 1164 1077 1232"> <p>✓</p> </td> <td data-bbox="1085 1164 1189 1232"> <p>✓</p> </td> <td data-bbox="1197 1164 1300 1232"> <p>✓</p> </td> <td data-bbox="1308 1164 1436 1232"> <p>✓</p> </td> </tr> <tr> <td data-bbox="486 1238 805 1283"> <p>Total</p> </td> <td data-bbox="813 1238 965 1283"> <p>100 %</p> </td> <td colspan="4" data-bbox="973 1238 1436 1283"></td> </tr> </tbody> </table>					Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed				a	b	c	d	<p>1. Assignment</p>	<p>20%</p>		<p>✓</p>	<p>✓</p>	<p>✓</p>	<p>2. Test</p>	<p>30%</p>	<p>✓</p>	<p>✓</p>	<p>✓</p>		<p>3. Final examination</p>	<p>50%</p>	<p>✓</p>	<p>✓</p>	<p>✓</p>	<p>✓</p>	<p>Total</p>	<p>100 %</p>				
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	<p>Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:</p> <p>Overall assessment:</p> <p><math>0.50 \times \text{End of Subject Examination} + 0.50 \times \text{Continuous Assessment}</math></p> <p>The continuous assessment (50%) is aimed at enhancing the students' comprehension and assimilation of various topics of the syllabus via several assignments and mid-term examination. The final examination assessment (50%) will also be considered to assess the students learning outcome.</p>																																						

<b>Student Study Effort Expected</b>	Class contact:	
	▪ Lecture / Case Study	39 Hrs.
	Other student study effort:	
	▪ Self-study / preparation	36 Hrs.
	▪ Assignments	36 Hrs.
	Total student study effort	111 Hrs.
<b>Reading List and References</b>	<ol style="list-style-type: none"> <li>1. Accident Investigation Techniques, Jeffrey S. Oakley. Published by: The American Society of Safety Engineers. ISBN: 1-885581-47-5</li> <li>2. A Human Error Approach to Aviation Accident Analysis: The Human Factors Analysis and Classification System (1st ed.). Wiegmann, D.A., &amp; Shappell, S.A. (2003). Routledge. ISBN: 9781315263878.</li> <li>3. Handbook of Aircraft Accident Notification, Investigation and Reporting, <a href="https://www.carc.jo/en/content/131-aircraft-accident-investigation-manual">https://www.carc.jo/en/content/131-aircraft-accident-investigation-manual</a></li> <li>4. Aircraft Accident Investigation, Richard Wood, Robert Sweginnis, Endeavor Books; 2nd edition (April 24, 2006). ISBN-13: 978-1892944177</li> </ol>	

December 2021