

Subject Description Form

Subject Code	AAE4015
Subject Title	Advanced Accident and Hazards Analysis with Big Data in Aviation
Credit Value	4
Level	3
Pre-requisite/ Co-requisite/ Exclusion	Pre-requisite: AAE4903 Human Factors in Aviation
Objectives	This subject will provide students with 1. An overview understanding of hazard recognition, accident prevention, and accident investigation; 2. The fundamental knowledge and skills to conduct a general air traffic accident investigation; and 3. Up-to-date case studies together with practical methods for accident analysis in aviation.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a. Describe the progress of an effective accident investigation; b. Analyse the contributing factors to accidents via advanced big data analytics techniques; c. Evaluate the different causal factors that contribute to accidents and their potential effects; and d. Design appropriate interventions/ recommendation to improve aviation safety.
Subject Synopsis/ Indicative Syllabus	Accident response and management – Aviation safety culture; Accident notification processes; Health and safety at the accident site; Aviation accident pathology. Accident investigation – Systematic approach to investigation; Collection of evidence; Data recorder and their analysis; Aviation accident photography; Hazards management on site; Investigative interview techniques. Accident analysis methods – Data preprocess; Data integration; Association rules and frequent patterns; Classification; Clustering; Outlier detection. Hazard analysis – Hazard analysis methods; Effects of hazard. Hazard control.

Teaching/Learning Methodology	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 emphasised. 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.					
	Teaching/Learning Methodology	Intended subject learning outcomes to be covered				
		a	b	c	d	
	1. Lecture	✓	✓	✓	✓	
	2. Case Study	✓	✓	✓	✓	
Assessment Methods in Alignment with Intended Learning Outcomes	Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed			
			a	b	c	d
	1. Assignment	20%		✓	✓	✓
	2. Test	30%	✓	✓	✓	
	3. Final examination	50%	✓	✓	✓	✓
	Total	100 %				
	Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes: Overall assessment: $0.50 \times \text{End of Subject Examination} + 0.50 \times \text{Continuous Assessment}$ 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. <u>Students must attend the final examination in order to attain a passing grade in the overall result.</u>					

Student Study Effort Expected	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.
Reading List and References	1. Accident Investigation Techniques, Jeffrey S. Oakley. Published by: The American Society of Safety Engineers. ISBN: 1-885581-47-5 2. A Human Error Approach to Aviation Accident Analysis: The Human Factors Analysis and Classification System (1st ed.). Wiegmann, D.A., & Shappell, S.A. (2003). Routledge. ISBN: 9781315263878. 3. Handbook of Aircraft Accident Notification, Investigation and Reporting, https://www.carc.jo/en/content/131-aircraft-accident-investigation-manual 4. Aircraft Accident Investigation, Richard Wood, Robert Sweginnis, Endeavor Books; 2nd edition (April 24, 2006). ISBN-13: 978-1892944177	

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