UNSW Course Outline

AVIA3601 Flight Data Analytics - 2024

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General Course Information

Course Code : AVIA3601
Year : 2024
Term : Term 3
Teaching Period : T3
Is a multi-term course? : No
Faculty : Faculty of Science
Academic Unit : School of Aviation
Delivery Mode : In Person
Delivery Format : Standard
Delivery Location : Kensington
Campus : Sydney
Study Level : Undergraduate
Units of Credit : 6

Useful Links

Handbook Class Timetable

Course Details & Outcomes

Course Description

The aviation industry is generating data at an increasing rate. Intelligent use of this data is becoming more important for safe, efficient and sustainable air transport. The Flight Data Analytics 6 UOC course will cover the sources of flight data, key parameters, data validation,

uses of the data, software tools and analysis – making sense of the data. Airline flight data analysis programs, the routine monitoring of data from every flight, will be a key focus of the course.

Course Aims

This course aims to develop an understanding of flight data sourced from devices onboard aircraft (e.g., the flight data recorder and the quick access recorder) as well as data transmitted real-time in flight (e.g., ACARS data and ADS-B data). The course will cover the entire signal path from sensor, acquisition, recording, recovery, analysis and presentation of the results.

There is an emphasis on the practical uses of the data by airlines, airports and aircraft/engine manufacturers and up-to-date analysis techniques. The course will use real aircraft flight data, airline flight data analysis software and case studies to provide the student with practical experience and knowledge.

Further aims of the course are to develop critical thinking skills to understand the limitations of the data and skills involved in clearly communicating the results of the analysis.

Course Learning Outcomes

Course Learning Outcomes
CLO1 : Identify various flight data, their sources and how to access them.
CLO2 : Analyse recorded flight data to investigate and risk assess reported or detected issues.
CLO3 : Apply their knowledge of flight data analytics to engage with stakeholders when evaluating the results of flight data analysis.
CLO4 : Communicate the results of flight data analyses through clear and detailed reports and/or presentations.

Course Learning Outcomes	Assessment Item
CLO1 : Identify various flight data, their sources and how to access them.	• Multiple Choice Quiz • Final Examination
CLO2 : Analyse recorded flight data to investigate and risk assess reported or detected issues.	• Flight Data Case Study and Video Presentation • Multiple Choice Quiz • Final Examination
CLO3 : Apply their knowledge of flight data analytics to engage with stakeholders when evaluating the results of flight data analysis.	• Flight Data Report • Flight Data Case Study and Video Presentation • Final Examination
CLO4 : Communicate the results of flight data analyses through clear and detailed reports and/or presentations.	• Flight Data Report • Flight Data Case Study and Video Presentation • Final Examination

Learning and Teaching Technologies

Moodle - Learning Management System

Assessments

Assessment Structure

Assessment Item	Weight	Relevant Dates
Multiple Choice Quiz Assessment Format: Individual	5%	Start Date: 1 Oct 2024 at 1pm Due Date: 1 Oct 2024 at 2pm
Flight Data Case Study and Video Presentation Assessment Format: Group	20%	Start Date: Week 2 Due Date: 25/10/2024 11:59 PM
Flight Data Report Assessment Format: Individual	25%	Start Date: Week 1 Due Date: 15/11/2024 11:59 PM
Final Examination Assessment Format: Individual	50%	Start Date: During UNSW Exam Period Due Date: During UNSW Exam Period

Assessment Details

Multiple Choice Quiz

Assessment Overview

The quiz will comprise of 20 multiple choice questions, focusing on course content taught in Weeks 1-3. The quiz will be made available online via the AVIA3601 Moodle course page at a set time allocated during Week 4. Students will be provided with one hour to complete the quiz and will only be allowed one attempt. Answers will be provided immediately to the student after submission of their completed attempt of the online quiz.

Course Learning Outcomes

- CLO1 : Identify various flight data, their sources and how to access them.
- CLO2 : Analyse recorded flight data to investigate and risk assess reported or detected issues.

Generative AI Permission Level

No Assistance

This assessment is designed for you to complete without the use of any generative AI. You are not permitted to use any generative AI tools, software or service to search for or generate information or answers.

For more information on Generative AI and permitted use please see here.

Flight Data Case Study and Video Presentation

Assessment Overview

Students will be asked to work in groups of 3-4 student maximum for this assessment.

Using a deidentified set of real aircraft flight data provided from a list of various data sets, nominated airline flight data analysis software and case studies, students will be asked to apply operational knowledge and skills as a team to critically analyse a scenario and create a 5-7 minute video presenting their findings and recommendations to a managerial board of an aviation organisation. Students will be required to submit their finalised video through Moodle.

Students will be marked on the level of operational knowledge displayed, and ability to interpret and effectively and cohesively present data as a group to an audience using appropriate terminology.

Making sense of data and effectively communicating the results of analysis is important in the aviation industry to focus time and attention on issues that affect safety and operational efficiency.

The assessment description and marking rubric for the assessment will be released in Week 1. The deadline for submitting the video presentation is Week 7, with feedback on the assessment being provided via Moodle by 10 working days after the submission deadline.

Course Learning Outcomes

- CLO2 : Analyse recorded flight data to investigate and risk assess reported or detected issues.
- CLO3 : Apply their knowledge of flight data analytics to engage with stakeholders when evaluating the results of flight data analysis.
- CLO4 : Communicate the results of flight data analyses through clear and detailed reports and/or presentations.

Generative AI Permission Level

Simple Editing Assistance

In completing this assessment, you are permitted to use standard editing and referencing functions in the software you use to complete your assessment. These functions are described below. You must not use any functions that generate or paraphrase passages of text or other media, whether based on your own work or not.
If your Convenor has concerns that your submission contains passages of AI-generated text or

media, you may be asked to account for your work. If you are unable to satisfactorily demonstrate your understanding of your submission you may be referred to UNSW Conduct & Integrity Office for investigation for academic misconduct and possible penalties.
For more information on Generative AI and permitted use please see here.

Flight Data Report

Assessment Overview

Students will write a 3000 word report in which they will undertake analysis of recorded flight data to investigate and risk assess a given reported or detected issue. Students will be marked on their knowledge of flight data analytics, the operational aviation insight they can bring to analysis, how well they communicate their evaluation of the results of flight data analysis in a written report, as well as their ability to problem-solve and recommend solutions.

Meeting the issues and challenges impacting the aviation industry will require a knowledge of flight data analytics and the critical thinking skills that are required in analysing and validating data.

The assessment description and marking rubric for this assessment will be made available via Moodle in Week 1. Students will be required to submit the report by Week 10 and feedback on the assignment will be provided by no more than 10 working days after the submission deadline.

Course Learning Outcomes

- CLO3 : Apply their knowledge of flight data analytics to engage with stakeholders when evaluating the results of flight data analysis.
- CLO4 : Communicate the results of flight data analyses through clear and detailed reports and/or presentations.

Generative AI Permission Level

Simple Editing Assistance

In completing this assessment, you are permitted to use standard editing and referencing functions in the software you use to complete your assessment. These functions are described below. You must not use any functions that generate or paraphrase passages of text or other media, whether based on your own work or not.
If your Convenor has concerns that your submission contains passages of AI-generated text or media, you may be asked to account for your work. If you are unable to satisfactorily demonstrate your understanding of your submission you may be referred to UNSW Conduct & Integrity Office for investigation for academic misconduct and possible penalties.

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Final Examination

Assessment Overview

Students will be asked to complete a final examination comprised of 8 short answer questions and one essay question, covering all content in the Flight Data Analytics course. This final examination will take place in person during the final examination period and students will be provided with 2 hours to complete the examination.

Course Learning Outcomes

- CLO1 : Identify various flight data, their sources and how to access them.
- CLO2 : Analyse recorded flight data to investigate and risk assess reported or detected issues.
- CLO3 : Apply their knowledge of flight data analytics to engage with stakeholders when evaluating the results of flight data analysis.
- CLO4 : Communicate the results of flight data analyses through clear and detailed reports and/or presentations.

Generative AI Permission Level

No Assistance

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General Assessment Information

UNSW Aviation's decision for Short Extension Policy

The School of Aviation has carefully reviewed its range of assignments and projects to determine their suitability for automatic short extensions as set out by the UNSW Short Extension Policy. After careful consideration of our course offerings and our current structure, we have determined that our current deadline structures already accommodate the possibility of unexpected circumstances that may lead students to require additional days for submission. Consequently, the School of Aviation has decided to not adopt the Short Extension provision for all its courses and has reassured that flexibility is integrated into our assessment deadlines. The decision is subject to revision in response to the introduction of new course offerings. Students may still apply for Special Consideration via the usual procedures.

Grading Basis

Standard

Course Schedule

Teaching Week/Module	Activity Type	Content
Week 1 : 9 September - 15 September	Workshop	Introduction to Flight Data Analytics Sources of data Key parameters Introduction to Automatic Dependent Surveillance – Broadcast (ADS-B) data
Week 2 : 16 September - 22 September	Workshop	Understanding ADS-B parameters Comparison of flight tracking app data and actual ADS-B data Creating track plots Introduction to the course flight data set (12 x B737 flights)
Week 3 : 23 September - 29 September	Workshop	Understanding the course flight data parameters Introduction to aircraft fuel usage
Week 4 : 30 September - 6 October	Workshop	Flight data analysis program (FDAP) introduction Revision for Assessment 1 (Quiz) Assessment 1: Tue 1 October 1300
Week 5 : 7 October - 13 October	Workshop	FDAP – event definitions Introduction to the course FDAP data set
Week 6 : 14 October - 20 October	Other	Flexibility Week. No Classes.
Week 7 : 21 October - 27 October	Workshop	FDAP – event analysis Assessment 2: Data analysis/presenting the results Assessment 2: Fri 25 October 2359
Week 8 : 28 October - 3 November	Workshop	FDAP – event statistical analysis
Week 9 : 4 November - 10 November	Workshop	FDAP – disseminating the results – crew feedback Assessment 3: Event analysis techniques
Week 10 : 11 November - 17 November	Workshop	The use of flight data analytics in the search for MH370 (non-assessable) Assessment 3: Preparing a written report Exam revision Assessment 3: Fri 15 November 2359

Attendance Requirements

Please note that lecture recordings are not available for this course. Students are strongly encouraged to attend all classes and contact the Course Authority to make alternative arrangements for classes missed.

General Schedule Information

UNSW Aviation's decision to not release Lecture Recordings:

The School of Aviation prides itself on offering education that supports students in their personalised learning journey. This involves providing opportunities for students to engage with academics and key aviation experts to identify and address learning gaps, develop core skills and knowledge, and foster an environment of collaboration and meaningful discussion with the UNSW Aviation community. To support this vision, UNSW Aviation has decided to require students to attend all synchronous lectures (in-person or online) and not release class

recordings to the student cohort. If students cannot attend a class and require learning support due to unforeseen circumstances, they should contact their Course Coordinator or Program Coordinator to discuss options for support and making up for missed class time.

Course Resources

Course Evaluation and Development

The myExperience Survey aims to boost student feedback which creates a culture of continuous improvement by identifying, responding to, and acting on student feedback.

The course survey will open towards the end of Term. Students are encouraged to participate in the survey via Moodle, myUNSW, or through the direct myExperience link.

Please provide constructive feedback and focus on your learning experience in relation to the course material. While the survey is confidential, it is not anonymous. Comments that breach the Student Code of Conduct, that are hurtful, racist, sexist or ill natured, may lead to disciplinary action.

Staff Details

Position	Name	Email	Location	Phone	Availability	Equitable Learning Services Contact	Primary Contact
Convenor	Neil Campbell		Canberra		On campus at Kensington only on Tuesdays 10am - 2pm.	No	Yes

Other Useful Information

Academic Information

Upon your enrolment at UNSW, you share responsibility with us for maintaining a safe, harmonious and tolerant University environment.

You are required to:

- Comply with the University's conditions of enrolment.
- Act responsibly, ethically, safely and with integrity.
- Observe standards of equity and respect in dealing with every member of the UNSW community.
- Engage in lawful behaviour.
- Use and care for University resources in a responsible and appropriate manner.

- Maintain the University's reputation and good standing.

For more information, visit the UNSW Student Code of Conduct Website.

Academic Honesty and Plagarism

Referencing is a way of acknowledging the sources of information that you use to research your assignments. You need to provide a reference whenever you draw on someone else's words, ideas or research. Not referencing other people's work can constitute plagiarism.
Further information about referencing styles can be located at https://student.unsw.edu.au/referencing

Academic integrity is fundamental to success at university. Academic integrity can be defined as a commitment to six fundamental values in academic pursuits: honesty, trust, fairness, respect, responsibility and courage. At UNSW, this means that your work must be your own, and others' ideas should be appropriately acknowledged. If you don't follow these rules, plagiarism may be detected in your work.
Further information about academic integrity, plagiarism and the use of AI in assessments can be located at:

- The Current Students site,
- The ELISE training site, and
- The Use of AI for assessments site.

The Student Conduct and Integrity Unit provides further resources to assist you to understand your conduct obligations as a student: https://student.unsw.edu.au/conduct

Submission of Assessment Tasks

Penalty for Late Submissions
UNSW has a standard late submission penalty of:

- 5% per day,
- for all assessments where a penalty applies,
- capped at five days (120 hours) from the assessment deadline, after which a student cannot submit an assessment, and
- no permitted variation.

Any variations to the above will be explicitly stated in the Course Outline for a given course or assessment task.

Students are expected to manage their time to meet deadlines and to request extensions as early as possible before the deadline.

Special Consideration

If circumstances prevent you from attending/completing an assessment task, you must officially apply for special consideration, usually within 3 days of the sitting date/due date. You can apply by logging onto myUNSW and following the link in the My Student Profile Tab. Medical documentation or other documentation explaining your absence must be submitted with your application. Once your application has been assessed, you will be contacted via your student email address to be advised of the official outcome and any actions that need to be taken from there. For more information about special consideration, please visit: https://student.unsw.edu.au/special-consideration

Important note: UNSW has a "fit to sit/submit" rule, which means that if you sit an exam or submit a piece of assessment, you are declaring yourself fit to do so and cannot later apply for Special Consideration. This is to ensure that if you feel unwell or are faced with significant circumstances beyond your control that affect your ability to study, you do not sit an examination or submit an assessment that does not reflect your best performance. Instead, you should apply for Special Consideration as soon as you realise you are not well enough or are otherwise unable to sit or submit an assessment.

Faculty-specific Information

Additional support for students

- The Current Students Gateway
- Student Support
- Academic Skills and Support
- Student Wellbeing, Health and Safety
- Equitable Learning Services
- UNSW IT Service Centre
- Science EDI Student Initiatives, Offerings and Guidelines

School Contact Information

Email:

aviation@unsw.edu.au

Telephone:

Undergraduate Courses - +61 2 9385 5756 (Katie Wang)

Postgraduate Courses - +61 2 9385 5787 (Michelle Lee)