UNSW Course Outline

AVIA5032 Quantitative Analysis in Aviation Economics - 2024

Published on the 02 Sep 2024

General Course Information

Course Code : AVIA5032
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 : Online
Delivery Format : Standard
Delivery Location : Kensington
Campus : Sydney
Study Level : Postgraduate
Units of Credit : 6

Useful Links

Handbook Class Timetable

Course Details & Outcomes

Course Description

Airlines and airports rely heavily on a large amount of data to make key decisions that impact the operational and financial success of the airline. Data collected helps to understand and inform key areas of aviation including the operational performance of aircraft, fuel consumption and

carbon emissions of airlines, spending behaviour of passengers that are members of the airline's frequent flyer program, key competitor data and the strategic decisions they make, and airline financial data and other performance indicators, such as on-time performance and reliability. Analysts and managers of airlines are tasked with combing through this wide array of data and drawing insights that will help to improve the operational and financial performance of the airline.

This online course is designed to empower postgraduate students with the skillset to analyse and interpret vast aviation data, and present them in a way that will help support essential aviation decision making. Students will have opportunities to engage in online, live skills-based workshops with an aviation expert to hone their practical data analytics skills for an aviation management context.

Course Aims

The aim of this course is to provide students with the opportunity to develop a solid foundation of practical knowledge and skills in data analytics that can be applied to their own research and understanding of the aviation industry. The course aims to support students in furthering their skills of assessing and understanding literature related to aviation research.

Course Learning Outcomes

Course Learning Outcomes
CLO1 : Appropriately apply and evaluate aviation operational and financial data.
CLO2 : Critique and apply different methods for estimating the long run average growth rates.
CLO3 : Explain different types of variables, descriptive statistics, probability concepts and density functions within an aviation context.
CLO4 : Test hypotheses related to a single population mean.
CLO5 : Describe the basic component parts of time series and how to build models of those parts.
CLO6 : Recall and appropriately apply regression analysis for the purpose of understanding and describing the movement in aviation variables.
CLO7 : Use econometrics software and modelling skills to analyse real-world aviation economics data.

Course Learning Outcomes	Assessment Item
CLO1 : Appropriately apply and evaluate aviation operational and financial data.	• Assignment 1 • Assignment 2 • Assignment 4
CLO2 : Critique and apply different methods for estimating the long run average growth rates.	• Assignment 2 • Assignment 4
CLO3 : Explain different types of variables, descriptive statistics, probability concepts and density functions within an aviation context.	• Assignment 3 • Assignment 2 • Assignment 4
CLO4 : Test hypotheses related to a single population mean.	• Assignment 3 • Assignment 4
CLO5 : Describe the basic component parts of time series and how to build models of those parts.	• Assignment 3 • Assignment 4
CLO6 : Recall and appropriately apply regression analysis for the purpose of understanding and describing the movement in aviation variables.	• Assignment 4
CLO7 : Use econometrics software and modelling skills to analyse real-world aviation economics data.	• Assignment 2 • Assignment 3 • Assignment 4

Learning and Teaching Technologies

Moodle - Learning Management System

Assessments

Assessment Structure

Assessment Item	Weight	Relevant Dates
Assignment 1 Assessment Format: Individual	20%	Start Date: Not Applicable Due Date: Week 4 : 04/10/2024 11:59PM
Assignment 2 Assessment Format: Individual	20%	Start Date: Not Applicable Due Date: Week 7 - 25/10/2024 11:59PM
Assignment 3 Assessment Format: Individual	20%	Start Date: Not Applicable Due Date: Week 9 : 10/11/2024 11:59PM
Assignment 4 Assessment Format: Individual	40%	Start Date: Not Applicable Due Date: 29/11/2024 11:59PM

Assessment Details

Assignment 1

Assessment Overview

For this assignment, you are required to answer a variety of questions associated with key airline operating statistics, such as passenger and freight load and capacity statistics. You will also be asked to answer various questions related to key airline financial statistics, such as passenger and freight revenue, costs, yield, unit cost as well as labour, fleet and fuel productivity. You will be provided with real-life airline datasets from which you must extract information to answer the questions for this assessment.

Part of this assessment will also test your skills in identifying the types of variables that are used in constructing models of aviation management operational and financial phenomena.

You are required to submit your assignment by Week 4. Details of the assignment will be provided in Week 1.

Written feedback and marks will be provided within 10 working days following submission.

Course Learning Outcomes

- CLO1 : Appropriately apply and evaluate aviation operational and financial data.

Assignment submission Turnitin type

This is not a Turnitin assignment

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.

Assignment 2

Assessment Overview

For this assessment, you will be tested on your understanding of basic probability concepts as they are applied to an aviation management problem. This is a precursor for understanding aviation risk, which involves a combination of the potential outcome of a risky situation and the probability of that outcome.

You are also required to use the normal distribution to solve questions about aviation risk. The questions are designed to test the ability of students to use normal distribution functions within Microsoft Excel to solve aviation probabilistic and risk questions.

The simulation question within the assignment is designed to test your understanding of the desire to quantify aviation risk by analysing the full range of risk and their probabilities, not just an estimate of central tendency, such as an average. The question is also designed to test your ability to set up an Excel spreadsheet to solve a problem.

You are required to submit your assignment by Week 7. Details of the assessment will be made available in Week 2.

Written feedback and marks will be provided within 10 working days following submission.

Course Learning Outcomes

- CLO1 : Appropriately apply and evaluate aviation operational and financial data.
- CLO2 : Critique and apply different methods for estimating the long run average growth rates.
- CLO3 : Explain different types of variables, descriptive statistics, probability concepts and density functions within an aviation context.
- CLO7 : Use econometrics software and modelling skills to analyse real-world aviation economics data.

Assignment submission Turnitin type

This assignment is submitted through Turnitin and students can see Turnitin similarity reports.

Generative AI Permission Level

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Assignment 3

Assessment Overview

For this assignment, you are required to find key aviation data from an aviation source and use this data to estimate key descriptive statistics. You will also be required to use Microsoft Excel to perform statistical analyses and draw a line graph.

In this assignment, you will also be introduced to the Student version of the econometrics software, Eviews. You will use this software in the assignment by estimating a bivariate regression applied to aviation data and use the bivariate regression for hypothesis testing.

You are required to submit your assignment by Week 9. Details of the assignment will be provided in Week 3.

Written feedback and marks will be provided within 10 working days following submission.

Course Learning Outcomes

- CLO3 : Explain different types of variables, descriptive statistics, probability concepts and density functions within an aviation context.
- CLO4 : Test hypotheses related to a single population mean.
- CLO5 : Describe the basic component parts of time series and how to build models of those parts.
- CLO7 : Use econometrics software and modelling skills to analyse real-world aviation economics data.

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Assignment 4

Assessment Overview

For the final assignment, you will be required to answer a set of questions based on aviation management data that is provided. You will be required to use the econometrics software, Eviews to estimate a relationship between several aviation management variables using multivariate regression analysis. You will be required to collect their own aviation data to complete this question. The multivariate regression analysis will test you on several phases of multivariate regression analysis, including estimation and interpretation, significance testing, diagnostic testing and forecasting.

You are permitted to use reference material, but this must all be appropriately referenced where required.

The questions and assignment description will be made available during the first week of the UNSW official examination period. You are required to submit the assignment by the end of the second week of the official UNSW examination period. Feedback is available upon inquiry with the course convenor.

Course Learning Outcomes

- CLO1 : Appropriately apply and evaluate aviation operational and financial data.
- CLO2 : Critique and apply different methods for estimating the long run average growth rates.
- CLO3 : Explain different types of variables, descriptive statistics, probability concepts and

density functions within an aviation context.
- CLO4 : Test hypotheses related to a single population mean.
- CLO5 : Describe the basic component parts of time series and how to build models of those parts.
- CLO6 : Recall and appropriately apply regression analysis for the purpose of understanding and describing the movement in aviation variables.
- CLO7 : Use econometrics software and modelling skills to analyse real-world aviation economics data.

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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.

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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. The preferred referencing style within this course is APA referencing.

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.*1* 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 and **plagiarism** can be located at:

- • The *Current Students* site https://student.unsw.edu.au/plagiarism, and
- • The *ELISE* training site http://subjectguides.library.unsw.edu.au/elise/presenting

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

Grading Basis

Standard

Course Schedule

Teaching Week/Module	Activity Type	Content
Week 1 : 9 September - 15 September	Topic	Unit 1 : Aviation Operational and Financial Data
Week 2 : 16 September - 22 September	Topic	Unit 2: Estimating Long Run Growth Rates
Week 3 : 23 September - 29 September	Topic	Unit 3 : Tools for Basic Description of Aviation Data
Week 4 : 30 September - 6 October	Topic	Unit 4 : Probability Theory and Continuous Distributions
Week 5 : 7 October - 13 October	Topic	Unit 5 : Discrete Probability Distributions, Skewness and Kurtosis
Week 6 : 14 October - 20 October	Topic	Unit 6 : Hypothesis Testing
Week 7 : 21 October - 27 October	Topic	Unit 7 : Time Series Fundamentals
Week 8 : 28 October - 3 November	Topic	Unit 8 : Bivariate Regression
Week 9 : 4 November - 10 November	Topic	Unit 9 : Multivariate Regression
Week 10 : 11 November - 17 November	Topic	Unit 10 : Panel Data Models

Attendance Requirements

Students are strongly encouraged to attend all classes and review lecture recordings.

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

Prescribed Resources

Textbook: Webber, Tony. (2023) "Quantitative Methods in Aviation Management", *Cambridge Scholars Publishing.Available from the UNSW bookshop and an e-copy is available from the library.* Use the following link for the bookshop https://www.bookshop.unsw.edu.au/details.cgi?ITEMNO=9781527591523

Recommended Resources

Recommended resources are available in the Moodle to this subject

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	Anthony Webber				via email and/or Moodle forums	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)