UNSW Course Outline

AVIA3201 Airline Resource Management - 2024

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General Course Information

Course Code : AVIA3201
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

<u>Useful Links</u>

<u>Handbook</u> <u>Class Timetable</u>

Course Details & Outcomes

Course Description

Airline operations are the functional areas that are directly associated with the operations of aircraft and the provision of services for aircraft operations. This course will focus on airline resources management and will explore these ideas from the viewpoint of equipment and crew

scheduling in the context of airline management.

There is strong continuity between the management of the 'corporate' aspects of the airline (taught in AVIA3101) and the operational aspects (taught in this course). This occurs mainly in the planning processes including fleet planning, aircraft scheduling, and crew scheduling. These important processes will be taught in this course from the viewpoint of resource allocation, utilisation, and optimisation. Some relevant topics are also covered in this course such as aircraft maintenance scheduling, operations control, air cargo, and flight on-time performance management.

Course Aims

The overall aim of this course is to enable students to develop and gain a further understanding of resource management through the investigation of aircraft scheduling and crew scheduling with a direct emphasis on their application to real-world situations in the field of airline management. This course aims to equip students with graduate attributes of analysing and evaluating contemporary issues in aviation management, governance, and business situations to propose appropriate solutions based on scientific, theoretical, and operational knowledge.

Relationship to Other Courses

This course follows AVIA3101 and focuses on airline resource allocation and optimisation. These resources include aircraft and crew.

Course Learning Outcomes

Course Learning Outcomes
CLO1 : Conduct airline fleet assignment and construct aircraft routing schedules.
CLO2 : Apply crewing regulations to analyse crewing costs and conduct long-term crew planning.
CLO3 : Construct crew schedules including crew pairing and rostering schedules.
CLO4 : Apply optimisation theories to conduct airline planning in operational areas with cost minimisation and asset utilisation strategies.

Course Learning Outcomes	Assessment Item
CLO1 : Conduct airline fleet assignment and construct aircraft routing schedules.	• Optimisation Programming Language (OPL) Quiz • Mid-Term Test • Group Project • Final examination
CLO2 : Apply crewing regulations to analyse crewing costs and conduct long-term crew planning.	• Optimisation Programming Language (OPL) Quiz • Mid-Term Test • Group Project • Final examination
CLO3 : Construct crew schedules including crew pairing and rostering schedules.	• Optimisation Programming Language (OPL) Quiz • Mid-Term Test • Group Project • Final examination
CLO4 : Apply optimisation theories to conduct airline planning in operational areas with cost minimisation and asset utilisation strategies.	• Optimisation Programming Language (OPL) Quiz • Mid-Term Test • Group Project • Final examination

Learning and Teaching Technologies

Moodle - Learning Management System | Echo 360

Learning and Teaching in this course

Teaching comprises lectures, tutorials, and guest speeches wherever available. Discussions on current aviation issues in the classroom are integral to this course. Class interaction is an important element and is encouraged both in the (virtual) classroom or online (Moodle). **Given the popularity of optimisation packages in the industry and to compensate the needs of theories**

in airline operational areas, an essential part of this course is on mathematical modelling and optimisation theories. This course focuses on the following areas in optimisation: aircraft scheduling and crew scheduling. The emphasis of this course is on both industry practices and theories with hands-on tutorials for solving industry optimisation problems but on a smaller scale. Team projects play a significant role in teaching and learning activities in this course. This gives students plenty hands-on experiences on solving industrial problems in a team environment. This course aims to provide a learning and teaching environment where students are actively engaged in the learning process as part of a community of learners. The course aims to be interesting, challenging, but manageable and enjoyable. Activities are linked to analytical skills, problem solving, teamwork and knowledge acquirement. Student diversity in terms of experiences and learning styles is valued and reflected in teaching strategies. Student assessments are designed to reflect the learning outcomes and teamwork.

Assessments

Assessment Structure

Assessment Item	Weight	Relevant Dates
Optimisation Programming Language (OPL) Quiz Assessment Format: Individual	10%	Due Date: Week 3: 23 September - 29 September
Mid-Term Test Assessment Format: Individual	20%	Due Date: Week 7: 21 October - 27 October
Group Project Assessment Format: Group	30%	Due Date: Week 10: 11 November - 17 November
Final examination Assessment Format: Individual	40%	Start Date: UNSW Final Exam Period Due Date: UNSW Final Exam Period

Assessment Details
Optimisation Programming Language (OPL) Quiz

Assessment Overview

You will be required to complete an online quiz in Week 3 related to optimisation programming language (OPL). The quiz will comprise of three compulsory parts, including a combination of multiple choice and numerical entry questions.

The quiz will assess course content covered in Weeks 1-3 (inclusive). You will have a maximum of two attempts to achieve your highest possible mark. You will be allowed two hours to complete each attempt.

Marks will be provided immediately following completion of the assessment. Feedback is available through inquiry with the course convenor.

Course Learning Outcomes

- CLO1 : Conduct airline fleet assignment and construct aircraft routing schedules.
- CLO2 : Apply crewing regulations to analyse crewing costs and conduct long-term crew planning.
- CLO3 : Construct crew schedules including crew pairing and rostering schedules.
- CLO4 : Apply optimisation theories to conduct airline planning in operational areas with cost minimisation and asset utilisation strategies.

Detailed Assessment Description

Please refer to Moodle announcements for details.

Assignment submission Turnitin type

Not Applicable

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.

Mid-Term Test

Assessment Overview

You will be required to complete an online mid-term test in Week 7, which assesses content covered in Weeks 1 – 5 (inclusive) of the course, including AR theory and models. The test will comprise of three compulsory parts, and a series of multiple-choice questions.

You will have two days to finish the mid-term exam in Week 7 . You will need CPLEX Optimisation Studio to complete your assessment.

Marks will be provided immediately following completion of the assessment. Feedback is available through inquiry with the course convenor.

Course Learning Outcomes

- CLO1 : Conduct airline fleet assignment and construct aircraft routing schedules.
- CLO2 : Apply crewing regulations to analyse crewing costs and conduct long-term crew

planning.

- CLO3 : Construct crew schedules including crew pairing and rostering schedules.
- CLO4 : Apply optimisation theories to conduct airline planning in operational areas with cost minimisation and asset utilisation strategies.

Detailed Assessment Description

Please refer to Moodle announcement for details.

Assignment submission Turnitin type

Not Applicable

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.

Group Project

Assessment Overview

For this assignment, you will be required to work in a group to complete four tasks, with each task addressing a key topic explored in the course. Tasks 1 and 2 make up Assignment Part A with a total weighting of 15%, and Tasks 3 and 4 make up Assignment Part B with a total weighting of 15% (total weighting of Group Report being 30%)

You are required to submit a 'check in' report for Part A in Week 5 and a final report for Part B in Week 10 that includes Part A report and forms the final project report. In addition, you will be required to submit model files of AR used in the project with the final report, using the format outlined in the assessment description.

Written feedback and marks will be provided for Assignment Part A within 10 working days after the submission deadline. Feedback on Part B is available through inquiry with the course convenor.

In addition to your group report, you will be required to individually submit an assessment of each of your group member's contributions to completing Assessment 3. This is to be submitted in Week 10, and completion and submission of this assessment is a requirement to receive a grade for your assessment.

For this submission, you will be provided with a Word document template to fill out. This template will include a section to describe each group member's contribution and a marking rubric for each group member that you must complete based on your observations of each individual group member's contributions. The description and completed rubric that you provide within the template for your individual group members will be considered by the convenor when awarding a final mark to each group member for this assessment. The intention of the assessment of group member contributions is to understand how you perceived the contributions of your peers, and whether you believe the effort and contribution was fair and equitable.

Course Learning Outcomes

- CLO1 : Conduct airline fleet assignment and construct aircraft routing schedules.
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- CLO3 : Construct crew schedules including crew pairing and rostering schedules.
- CLO4 : Apply optimisation theories to conduct airline planning in operational areas with cost minimisation and asset utilisation strategies.

Detailed Assessment Description

Please refer to the project outline for details.

Assessment Length

5,000 words

Submission notes

Please see the project outline for details.

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](#).

You are permitted to use AI tools/software for grammar and spellchecking, such as Grammarly.

Final examination

Assessment Overview

You are required to undertake a final examination during the official UNSW examination period.

The examination will assess knowledge and skills taught in the entire course and will comprise of a series of multiple-choice questions and an essay question. You will have 120 minutes to complete the examination.

Feedback is available through inquiry with the course convenor.

Course Learning Outcomes

- CLO1 : Conduct airline fleet assignment and construct aircraft routing schedules.
- CLO2 : Apply crewing regulations to analyse crewing costs and conduct long-term crew planning.
- CLO3 : Construct crew schedules including crew pairing and rostering schedules.
- CLO4 : Apply optimisation theories to conduct airline planning in operational areas with cost minimisation and asset utilisation strategies.

Assessment information

This course will have an invigilated exam held on UNSW's Kensington campus. The exam will be conducted on Inspera, an online assessment platform.

A requirement for this exam is that you come to your exam with a fully charged laptop.

If you are completing this course online as a remote student the UNSW Exams Team will contact you to arrange an online invigilated exam monitored by UNSW staff, via Zoom. You will need a working camera and microphone on your laptop and will be required to have your camera on for the entire duration of the exam.

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.

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.

<u>Grading Basis</u>

Standard

Course Schedule

Teaching Week/Module	Activity Type	Content
Week 1 : 9 September - 15 September	Blended	L0- Course overview & team project announcement L1- Recap on Airline Schedule Planning L1-T0- Timetable (network) building for the group project L1-T1- IBM CPLEX Optimisation Studio and OR Models
Week 2 : 16 September - 22 September	Blended	L2- Fleet Assignment L1-T2- Building network models in OPL
Week 3 : 23 September - 29 September	Blended	L3- Aircraft Routing and Optimisation Model L3-T1- AR model and tutorial
Week 4 : 30 September - 6 October	Blended	L3-T2- AR model and tutorial G- Schedule Optimisation in Airlines- QF (TBC)
Week 5 : 7 October - 13 October	Blended	L4- Crew Scheduling and Optimisation- theories L4-T1- Crew Pairing tutorial (recording) L4-T2- Crew Rostering tutorial (recording)
Week 6 : 14 October - 20 October	Other	Flexibility Week
Week 7 : 21 October - 27 October	Blended	Midterm exam (online) L5- Airline Ground Operations and Delay Modelling (recording) L4-T3- Crew establishment and long-term planning (recording)
Week 8 : 28 October - 3 November	Blended	G- Airline Crew Planning- industry perspectives- QF (TBC) L5/6-T1- Ground ops & modelling tutorial
Week 9 : 4 November - 10 November	Blended	L6- Delay Management and Disruption Recovery
Week 10 : 11 November - 17 November	Blended	Disruption Recovery Exercise

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

This course consists of 4 hours of class contact hours. You are expected to take, at least, an additional 4-8 hours of non-class contact hours to complete assessments, readings, and exam preparation.

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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

Wu, C. L., 2010. *Airline Operations and Delay Management*. Ashgate, England.

Print: https://www.bookshop.unsw.edu.au/details.cgi?ITEMNO=9780754672937

Digital: https://unswbookshop.vitalsource.com/products/-v9781317182948

Bazargan, M., 2009. *Airline Operations and Scheduling*; 2nd Edition. Ashgate, England.

Print: *https://www.bookshop.unsw.edu.au/details.cgi?ITEMNO=9780754679004*

Digital: https://unswbookshop.vitalsource.com/products/-v9781317182917

These texts can be borrowed from UNSW Library both in hard copy and soft copy forms (e.g. e-books). It is essential that students have a copy of these texts as the teaching of this course

closely follows the structure and contents of the prescribed texts. E-books are available for download for UNSW students via the Library portal, so please visit UNSW Library and download a copy of e-book before starting this course. This text can also be purchased from UNSW Bookshop: https://www.bookshop.unsw.edu.au, where this text is usually in stock and readily available. Books are also available for purchase online from the publisher (Taylor & Francis) and Amazon. Other texts and journal papers that may be of assistance are provided on Moodle via UNSW Library. The use of library resources is essential for your study in this course.

Recommended Resources

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.*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.

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	Cheng-Lung Wu		School of Aviation, UNSW Sydney			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

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