

**The University of New South Wales  
School of Aviation**

**AVIA5037 – Airline Operations and Delay Management**

**2016 Course Outline**

**Course Staff**

The lecturer in charge is Dr. Cheng-Lung (Richard) Wu in the School of Aviation. Dr. Wu can be contacted via e-mail at C.L.Wu(at)unsw.edu.au. Many of your questions may be related to study contents of this course. If this is the case, you are encouraged to ask your questions on Moodle, so everyone in the class can get involved in answering your question.

**About the Author**

**Dr. C. Richard Wu**

*BEng (NTU), MEng (NTU), PhD (Loughborough)*

Senior Lecturer, School of Aviation, UNSW Australia  
Principal Consultant, Reea Aviation Training and Consulting  
IATA Certified Instructor- Airports and Ground Ops

Dr. Wu joined UNSW Aviation in 2002 specialising in airline operations, airline network modelling, delay management, schedule planning and optimisation. Wu's industrial experiences include transport engineering (expressway design & planning; Taipei City Government, Taiwan), airport retail business management & terminal planning (Taipei Songshan Int'l Airport, Taiwan), and consulting projects with various airlines and airports. Dr. Wu has been a certified IATA training instructor since 2010 in the portfolio of Airport and Ground Operations.

Dr. Wu's research interests focus on airport operations, airline operations and schedule optimisation. An emerging interest has been on the joint study of aviation and tourism issues, focusing on the impact of aviation on tourism development and tourist dispersal in regional Australia. Dr. Wu published a book with Ashgate Publishing in 2010, titled '*Airline Operations and Delay Management*' which also serves as the prescribed textbook of this course.

**Course Information**

*Aims*

This course is offered in S1 and focuses on: airline ground operations (incl. pax facilitation and aircraft turnaround operations), delay data collection, delay data

analysis, delay development modelling, airline networks and the emerging concept of robust airline scheduling. The rationale of this course is to provide students with practical airline operations knowledge, coupled with the use of math models in delay analysis, leading to the study of ways to improve the robustness of airline schedule in actual operations. Hence, some units of this course may contain mathematical models that require assistance in study. On-going assistance and classroom discussion on Moodle will be organised. Prior mathematical and basic statistical knowledge are ideal but not essential for this course. Students with airline operations experience may be able to grasp this course quickly; however, prior operations experience is not essential for studying this course.

The objectives of this course are to:

- provide students with advanced understanding of airline operations and the concept of schedule planning,
- explore the role of uncertain disruptions in daily airline operations,
- focus on improving airline schedule robustness by considering operational uncertainties,
- develop mathematical models that help solve operational issues,
- understand how schedules can be improved by the emerging concept of robust scheduling.

### *Learning Outcomes*

On completion of this course students should be able to:

- acquire advanced understanding of airline operations and the feedback to airline schedule planning,
- have good understanding of the role of uncertainties in daily airline operations and how airline schedules should be designed to mitigate effects from unexpected disruptions,
- identify why delays occur in airline operations, to model delays and how delay propagate through an airline network due to resource connections,
- develop math model to model airline delays and understand how schedules can be adjusted to reflect delay risks in operations,
- understand the emerging concept of 'robust airline scheduling' and how this concept is rooted in the feedback from airline operations and delay management.

### *Location*

This course runs for the duration of Semester 1 and is delivered via distance education. Course materials are supplied via the Moodle platform.

### *Learning and Teaching Philosophy*

The learning and teaching strategy of this course is to bring the practical airline operations context into a rigorous analytical framework that is increasingly important for airline scheduling and operations. This allows students to develop good understanding of airline operations and scheduling principles by using practical examples of airline operational activities such as flight dispatch, ground operations, aircraft turnaround and passenger facilitation. The teaching rationale is to use this knowledge and lead students into the development of math models that can be used to solve real-world operational issues in airline operations such as schedule improvement and delay management.

### *Internet*

Online content and study materials can be accessed via Moodle at:  
<https://moodle.telt.unsw.edu.au/>

### **Assessment**

The MScTech (Aviation)/MAvMgmt Program's approach to assessment closely follows that of the Australian Open Learning Program of the Australian Graduate School of Management. At all times assessment is intended to form a component of the learning process and assignments are designed to encourage you to apply what you have learnt to your own organisation. Assignments will be assessed on the basis of how you apply subject materials to gaining new insights into airline operations, and ideally your works and organisation. Written comments will accompany your return assignments or exercises and should provide useful feedback. The examination will provide you and UNSW with feedback about your comprehension of the subject contents.

### *Criteria for Assessment*

Unless otherwise specified, the following criteria will be applied in assessing your written work:

- Evidence of understanding of the concepts, theories and ideas developed in the subject;
- Ability to apply these concepts to situations from your own experience;
- Capacity to structure an exercise or assignment logically and limit it to the length required;
- Degree to which the material submitted for assessment addresses the specified assignment requirements.

### **Assignment 1**

Unit 11	Inherent delays	§5.4
Unit 12	Robust airline scheduling	§6

Some units (denoted by \* in the table) contain technical and mathematical modelling materials and may take longer to study. This course schedule is subject to change. Any change will be announced on Moodle and a revised course outline will be available together with the announcement.

## Academic Honesty and Plagiarism

The MScTech (Aviation)/MAvMgmt Postgraduate Program requires compliance with the UNSW Policy on Academic Honesty and Plagiarism.

Students are referred to the University's rules on academic conduct, which are contained within the *Student Handbook*. Put simply, plagiarism is intellectual dishonesty and the theft of other people's work. Consequences for students caught plagiarising or stealing the work of others can include failure of the course or even exclusion from the University.

Plagiarism is the presentation of the thoughts or work of another as one's own<sup>1</sup>. Examples include:

- direct duplication of the thoughts or work of another, including by copying work, or knowingly permitting it to be copied. This includes copying material, ideas or concepts from a book, article, report or other written document (whether published or unpublished), composition, artwork, design, drawing, circuitry, computer program or software, web site, Internet, other electronic resource, or another person's assignment without appropriate acknowledgement;
- paraphrasing another person's work with very minor changes keeping the meaning, form and/or progression of ideas of the original;
- piecing together sections of the work of others into a new whole;
- presenting an assessment item as independent work when it has been produced in whole or part in collusion with other people, for example, another student or a tutor; and
- claiming credit for a proportion of work contributed to a group assessment item that is greater than that actually contributed.<sup>2</sup>

Submitting an assessment item that has already been submitted for academic credit elsewhere may also be considered plagiarism. The inclusion of the thoughts or work of another with attribution appropriate to the academic discipline does not amount to plagiarism. Students are encouraged to seek advice from academic staff whenever necessary to ensure they avoid plagiarism in all its forms.

The Learning Centre website is the central University online resource for staff and student information on plagiarism and academic honesty. It can be located at:

<sup>1</sup> Based on that proposed to the University of Newcastle by the St James Ethics Centre. Used with kind permission from the University of Newcastle.

<sup>2</sup> Adapted with kind permission from the University of Melbourne.

[www.lc.unsw.edu.au/plagiarism](http://www.lc.unsw.edu.au/plagiarism)

## **Open Book Examinations and Plagiarism**

Open book examinations are examinations which allow students to refer to notes/texts/etc to assist in preparing answers. They allow students, in effect, to research answers during the period of examination. Students in open book examinations are, however, expected to submit their own work as answers to examination questions. Students in open book examinations who merely copy portions of notes/texts into their answers rather than submitting their own work are plagiarising or stealing the copied material and will receive no marks for such answers and, in addition, will be subject to the University sanctions for plagiarism.

## **Informal feedback**

As well as the formal assessment procedure, every attempt will be made to give informal feedback during the instruction sessions. This might consist of students swapping exercises to comment on each other's work, or it might consist of group discussion. It is essential that all the set exercises be attempted in order to achieve a satisfactory level of understanding of the basic concept of the subject.

## **Internet**

Of increasing importance and relevance in studying is of course the Internet. A good starting point of using internet for study is UNSW Library (<https://library.unsw.edu.au>). Resources and materials are available for your study and access may require you to go through the portal of UNSW Library for different services. Online reference materials for the course is helpful but must be viewed and examined carefully. Please ensure you fully cite any web references you use in your assignments and the date on which you referenced the material.

As a final comment, it is of paramount importance with any research but in particular with online research, that the reference source be verified and checked to ascertain its accuracy and authenticity. Obviously the official websites of governments, educational institutions, agencies and reputable organisations are usually the best and most reliable source of information but most references still need to be checked for currency, especially in relation to legislation in aviation. It is also common practice to state the date of viewing or referencing of online information sources.

## **Studying and Research**

To supplement the course materials, references to particular sections of *Airline Operations and Delay Management* will be made. The following symbol instructs a student to finish the unit with further reading of section §2.3 of the textbook.



Please read your textbook, §2.3

## Textbooks

The prescribed text for this course is:

→ **Wu, C. L., 2010. *Airline Operations and Delay Management*, Ashgate Publishing, UK.**

This text 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 this text as the teaching of this course closely follows the structure and contents of the prescribed text. E-books of this text 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 online via the links below. You can also purchase this title from UNSW Bookshop: <https://www.bookshop.unsw.edu.au>, where this text is usually in stock and readily available.

- The publisher, Ashgate: <http://www.ashgate.com/isbn/9780754672937>,
- Amazon: [http://www.amazon.com/Airline-Operations-Delay-Management-Cheng-Lung/dp/075467293X/ref=asap\\_bc?ie=UTF8](http://www.amazon.com/Airline-Operations-Delay-Management-Cheng-Lung/dp/075467293X/ref=asap_bc?ie=UTF8).

Other texts and journal papers that may be of assistance are referenced in the various sections of each unit or made available via UNSW Library. You may find that some of these publications are also useful references in areas other than the extracted sections. The use of library resources is essential for your study in this course.

## Report Writing

Report writing standards and requirements vary in the University environment and within industry and Government. It is not expected that students will be perfect in this area. The standards in this course are similar to the author's experience in producing action-orientated papers for the industry and technical papers for international aviation journals. The standards for referencing etc are not critical as long as you do use quotes where appropriate and acknowledge other people's ideas where necessary, i.e. proper citation and references.

### **Continual Course Improvement**

Periodically, student evaluative feedback on the course is gathered, using among other means, UNSW's Course and Teaching Evaluation and Improvement (CATEI) Process. Student feedback is taken seriously, and continual improvements are made to the course based in part on such feedback. Significant changes to the course will be communicated to subsequent cohorts of students taking the course

### **Teaching Strategies**

The Master of Science and Technology in Aviation and its associated programs, the Graduate Certificate in Aviation Management and the Graduate Diploma in Aviation Management, are offered through distance education and have been specifically designed for students who are unable to attend weekly sessions at the university. The MScTech (Aviation)/MAvMgmt is targeted towards professionals and managers who work in aviation related environments.

### **Administrative Matters**

Students should be familiar with the information contained in <https://my.unsw.edu.au> regarding expectations of students, assignment submission, examination procedures, equity and diversity and other policies that affect you. A Postgraduate Aviation Student Guide can be obtained from the School of Aviation and the guide is also available on Moodle. Please contact Ms. Jamie LIM at: [jamie.lim@unsw.edu.au](mailto:jamie.lim@unsw.edu.au) for any administrative enquiries.

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